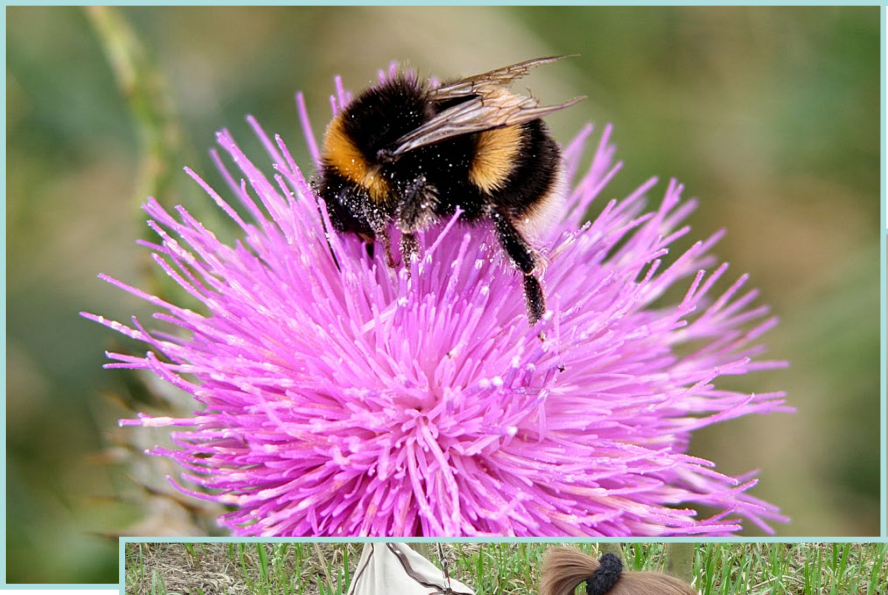
UK Biodiversity Indicators 2014



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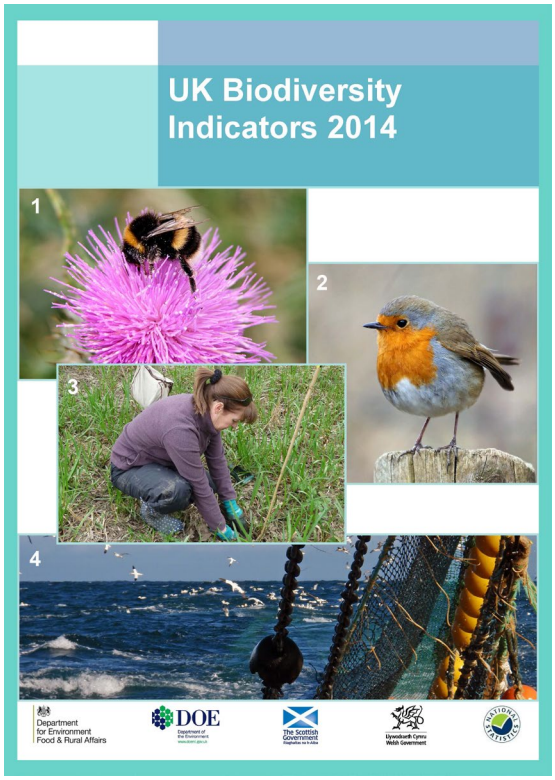


1. Bumblebee *Bombus lucorum agg* © Marilyn Peddle/Creative Commons license https://creativecommonsorglicensesby2.0legalcode

2. European Robin *Erithacus rubecula* © Helen Haden/Creative Commons license https://creativecommonsorglicensesby2.0legalcode

3. Volunteer taking part in a bioblitz © Anna Robinson/JNCC

4. Seabirds at sea © Sean Douglas/Marine Management Organisation

UK Biodiversity Indicators 2014

Measuring progress towards halting biodiversity loss

Department
for Environment
Food & Rural Affairs

Contents

	Introduction	
	UK biodiversity indicators 2014	2
	Assessing indicators	3
	Overview of assessment of change for all indicators	4
	Assessment of change: all measures	7
	Assessment of change: Strategic Goals B and C	8
A1	Awareness, understanding and support for conservation	9
A2	Taking action for nature: volunteer time spent in conservation	10
A3	Value of biodiversity integrated into decision making	11
A4	Global biodiversity impacts of UK economic activity / sustainable consumption	11
A5	Integration of biodiversity considerations into business activity	12
B1	Agricultural and forest area under environmental management schemes	14
B2	Sustainable fisheries	17
B3	Climate change adaptation	18
B4	Pressure from climate change	19
B5	Pressure from pollution	20
B6	Pressure from invasive species	22
B7	Surface water status	24
C1	Protected areas	25
C2	Habitat connectivity	27
C3	Status of European habitats and species	28
C4	Status of UK priority species	30
C5	Birds of the wider countryside and at sea	33
C6	Insects of the wider countryside (butterflies)	37
C7	Plants of the wider countryside	38
C8	Mammals of the wider countryside (bats)	39
C9	Genetic resources for food and agriculture	40
D1	Biodiversity and ecosystem services	43
E1	Biodiversity data for decision making	46
E2	Expenditure on UK and international biodiversity	47
	Enquiries about the biodiversity indicators or this publication	50
	Annex: National Statistics	51

Introduction

UK Biodiversity Indicators 2014

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 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 continued to be based on the most robust and reliable available data; and remained relevant to the new international goals and targets[1]. Since then the indicators have been refined to improve their relevance/quality, and new indicators developed to fill gaps. 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 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 formed a major part of the UK's 5th National Report to the CBD in 2014, 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 indicators may be subject to further review as necessary.

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.

Previous versions of the indicators are available for download at http://jncc.defra.gov.uk/ukbi. Links to the full detail of each of the previous editions are provided on the website (stored on the National Archives website). At the 8th Biodiversity Indicators Forum, a recommendation was made to publish a transparent statement of the level of confidence that can be ascribed to each individual indicator. The Biodiversity Indicators Working Group (Defra and JNCC) have undertaken a preliminary assessment which will be peer-reviewed during 2015.

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[2].

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 C3a, C3b and C9a have a six year short term assessment.

Overview of assessment of change for all indicators

The table below summarises traffic light assessments for the 24 indicators and their component measures.

Indicator number (Strategic Goal / number), title, and measures where applicable			**Long-term change**[3]	**Short-term change**[4]
A1. Awareness, understanding and support for conservation			⋯	⋯
A2. Taking action for nature: volunteer time spent in conservation			✓ 2000–2013	✗ 2008–2013
A3. Value of biodiversity integrated into decision making			Under development	
A4. Global biodiversity impacts of UK economic activity / sustainable consumption			Under development	
A5. Integration of biodiversity considerations into business activity	A5a. Environmental Management Systems		⋯	⋯
	A5b. Environmental consideration in supply chains		⋯	⋯
B1. Agricultural and forest area under environmental management schemes	B1a. Area of land in agri-environment schemes	B1a(i) Higher-level or targeted schemes	✓ 1992–2013	✓ 2008–2013
		B1a(ii) Entry-level type schemes	⋯	✓ 2008–2013
	B1b. Area of forestry land certified as sustainably managed		✓ 2001–2014	≈ 2009–2014
B2. Sustainable fisheries			✓ 1990–2012	✓ 2007–2012
B3. Climate change adaptation			Under development	
B4. Pressure from climate change			Not Assessed	Not Assessed
B5. Pressure from pollution	B5a. Air pollution	B5a(i). Area affected by acidity	✓ 1996–2011	✓ 2006–2011
		B5a(ii). Area affected by nitrogen	✓ 1996–2011	✓ 2006–2011
	B5b. Marine pollution		✓ 1990–2012	≈ 2007–2012
B6. Pressure from invasive species	B6a. Freshwater invasive species		✗ 1960-2014	Not Assessed
	B6b. Marine (coastal) invasive species		✗ 1960-2014	Not Assessed
	B6c. Terrestrial invasive species		✗ 1960-2014	Not Assessed
B7. Surface water status			⋯	≈ 2008 – 2012

Indicator number (Strategic Goal / number), title, and measures where applicable			Long-term change[3]	Short-term change[4]
C1. Protected areas	C1a. Total area of protected areas: on-land		 1950–2014	 2009–2014
	C1b. Total area of protected areas: at-sea		 1950–2014	 2009–2014
	C1c. Condition of Areas/Sites of Special Scientific Interest			 2008/09 – 2013/14
C2. Habitat connectivity			Under development	
C3. Status of European habitats and species	C3a. Status of UK habitats of European importance			 2007–2013
	C3b. Status of UK species of European importance			 2007–2013
C4. Status of UK priority species	C4a. Status of priority species – relative abundance		 1970–2012	 2007–2012
	C4b. Status of priority species – frequency of occurrence – insects		 1970-2011	Not Assessed
C5. Birds of the wider countryside and at sea	C5a. Farmland birds		 1970–2012	 2007–2012
	C5b. Woodland birds		 1970–2012	 2007–2012
	C5c. Wetland birds		 1975–2012	 2007–2012
	C5d. Seabirds		 1970–2013	 2008–2013
	C5e. Wintering waterbirds		 1975/76 – 2011/12	 2006/07 – 2011/12
C6. Insects of the wider countryside	C6a. Semi-natural habitat specialists		 1976–2013	 2008–2013
	C6b. Species of the wider countryside		 1976–2013	 2008–2013
C7. Plants of the wider countryside			Under development	
C8. Mammals of the wider countryside (bats)			 1999–2012	 2007-2012
C9. Genetic resources for food and agriculture	C9a. Animal genetic resources – effective population size	C9a(i). Native sheep breeds		 2001–2007
		C9a(ii). Native cattle breeds		 2001–2007
	C9b. Plant genetic resources – enrichment index		 1960–2012	 2007–2012

Indicator number (Strategic Goal / number), title, and measures where applicable		Long-term change[3]	Short-term change[4]
D1. Biodiversity and ecosystem services	D1a. Fish size classes in the North Sea	1983–2011	2006–2011
	D1b. Removal of greenhouse gases by UK forests	Not Assessed	Not Assessed
	D1c. Status of pollinating insects	Not Assessed	Not Assessed
E1. Biodiversity data for decision making	E1a. Cumulative number of records	2004–2014	2009–2014
	E1b. Number of publicly accessible records at 1km^2 resolution or better		2009–2014
E2. Expenditure on UK and international biodiversity	E2a. Public sector expenditure on UK biodiversity	2000/01 – 2013/14	2008/09 – 2013/14
	E2b. Non-governmental organisation expenditure on UK biodiversity		
	E2c. UK expenditure on international biodiversity	2000/01 – 2013/14	2008/09 – 2013/14

[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. Indicators C3a, C3b, and C9a have a six year short-term assessment.

Improving

Deteriorating

Little or no overall change

Insufficient or no comparable data

The individual assessments for each measure can be combined to produce an overall picture of progress made. The charts below display the numbers of measures that have shown an improvement (green traffic light), 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 biodiversity goals and targets agreed in 2010 and set out in the Strategic Plan for Biodiversity 2011–2020[5]. The Strategic Plan has five goals (A-E), 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. To improve the **status** of biodiversity by safeguarding ecosystems, species and genetic diversity.

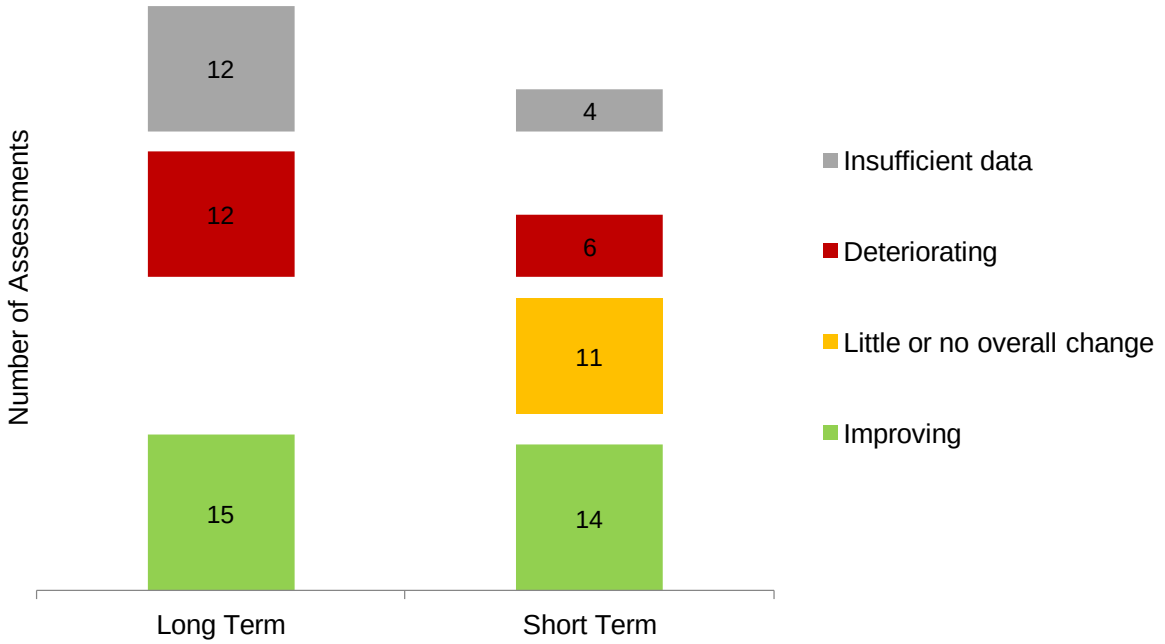
D. Enhance the **benefits** to all from biodiversity and ecosystems.

E. Enhance **implementation** through planning, knowledge management and capacity building.

As well as an overall summary, based on all measures in the indicator set, 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.

[5] The targets are known as 'Aichi Targets', after the province in Japan where they were agreed.

Assessment of change: all measures



The UK biodiversity indicators set comprises 24 indicators and 47 measures. Of these, eight measures are not assessed in the long-term, and 12 in the short term, as the measures are either under development, or analytical methods for short term assessment need to be refined. Fifteen of the 39 measures assessed over the long term, show an improvement, compared to 14 of the 35 measures that are assessed over the short term. Twelve measures show a decline in the long term, and six a decline in the short term. Measures that improved or deteriorated in the long term have not necessarily continued to improve or deteriorate respectively in the short term.

Measures showing an improvement in the short term include: the area of land in agri-environment schemes, sustainable fisheries, air pollution, the extent of protected sites on-land and at-sea, condition of areas/sites of special scientific interest, status of species of European importance 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 on-land and at-sea, populations of wintering water birds, plant genetic resources and expenditure on UK and international biodiversity.

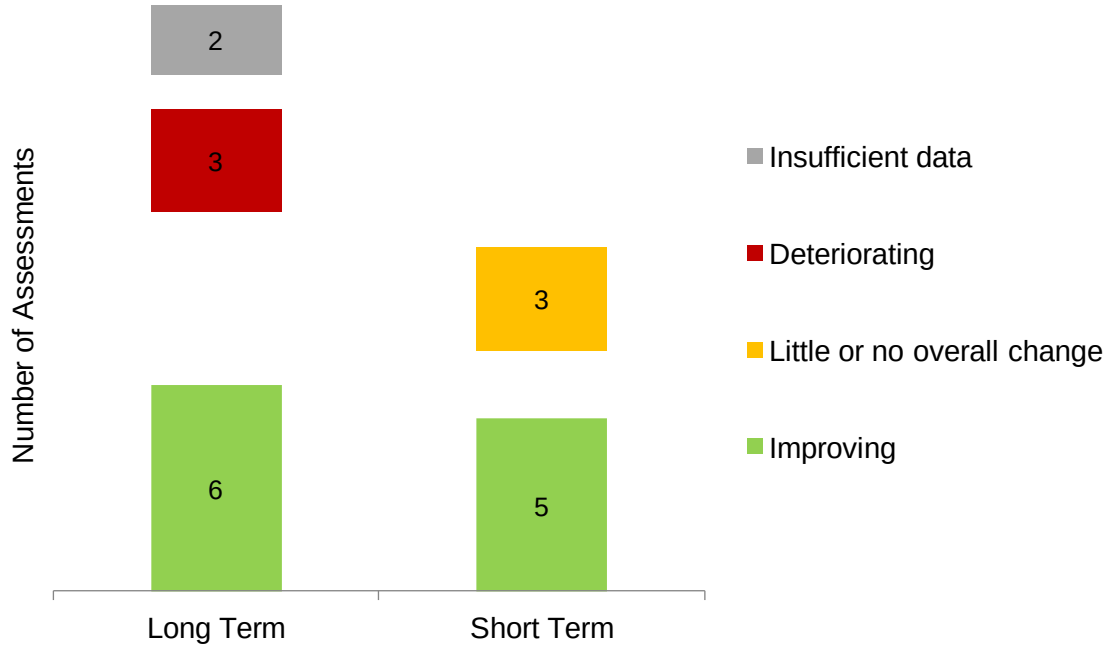
Measures showing long-term deterioration include: prevalence of terrestrial, freshwater and marine (coastal) invasive species, status of priority species, populations of farmland, woodland and wetland birds, and populations of butterflies (both specialists and those associated with the wider countryside).

Some of these measures have continued to deteriorate in the short term (e.g. populations of farmland and wetland birds).

New measures were published in 2014 for awareness, understanding and support for conservation; integration of biodiversity considerations into business activity; priority species (frequency of occurrence); ecosystem services (pollinating insects and removal of greenhouse gas by forests); and NGO expenditure on UK biodiversity.

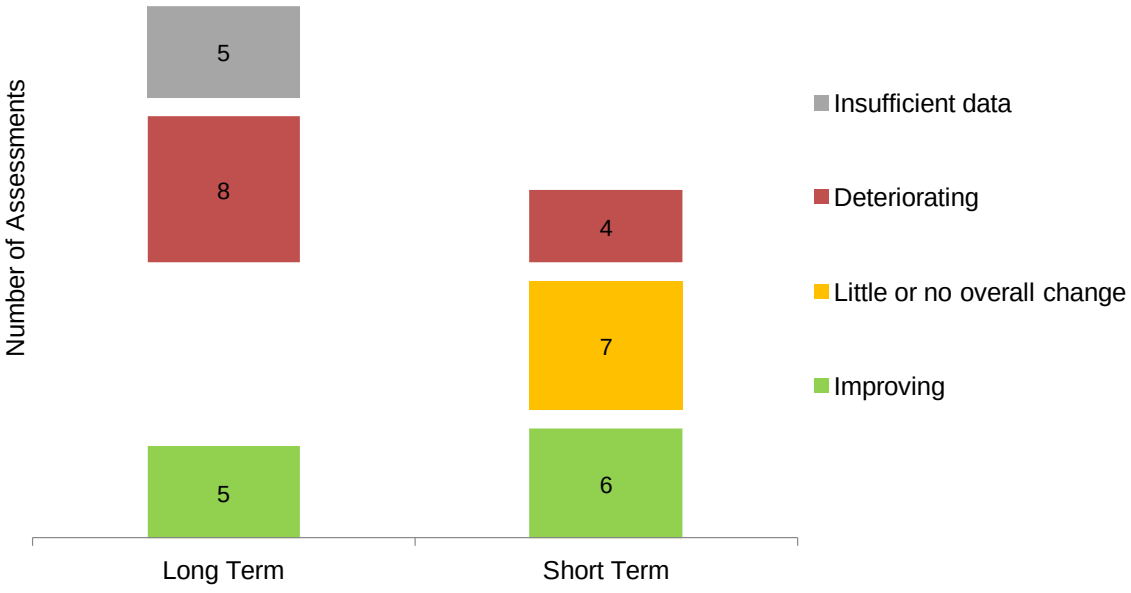
Assessment of change: Strategic Goals B and C

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



The indicators under Strategic Goal B (seven indicators and 13 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 pollution). However, there has been a long-term increase in the prevalence of invasive species, reflecting a pattern of continuing or growing threat to biodiversity in the UK. In the short term there is little or no overall change in surface water status, marine pollution, and the area of forestry land certified as sustainably managed.

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



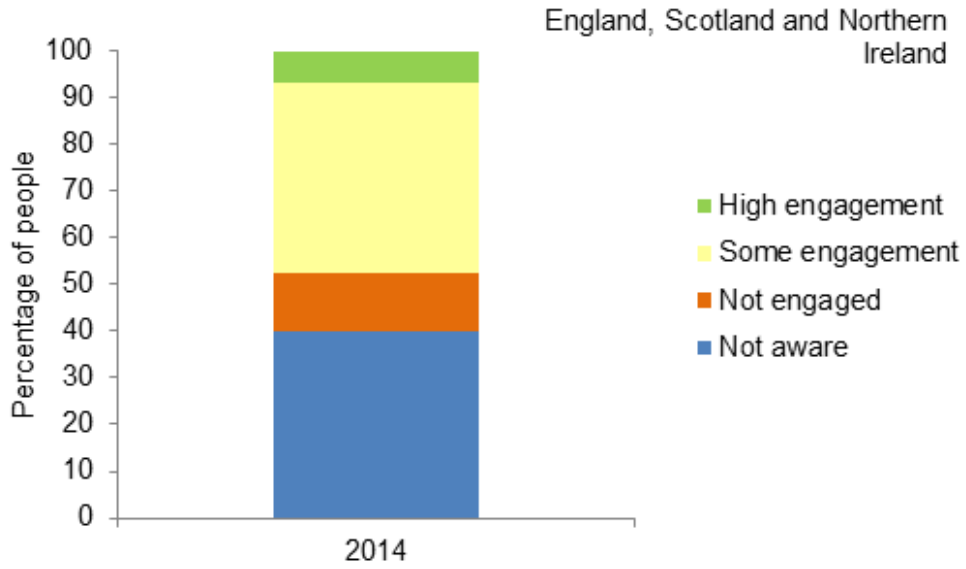
There were long-term declines for eight measures under Strategic Goal C (nine indicators and 20 measures prefixed 'C' in the summary table, covering status of biodiversity), reflecting the declines

in many species populations seen in the 1970s and 1980s. In the short term, there is some evidence that some of these long-term declines have slowed, with some measures previously assessed as deteriorating showing little or no overall change (e.g. butterflies, woodland birds, and the abundance of priority species). In total, six measures have shown improvement over the short term, including protected areas, status of UK species of European importance, and plant genetic resources. These conclusions should be viewed with some caution as changes are more difficult to assess reliably over the short term.

A1. Awareness, understanding and support for conservation

Type: Response indicator

Figure A1i. Public engagement with biodiversity loss: awareness, concern and action. Preliminary data, 2014.



Notes:

1. This chart shows preliminary data for England, Scotland and Northern Ireland, collected over 6 months in 2014. Preliminary data for Wales are not available. The first full year of data for all of the four countries will be published in 2015.
2. Groups are defined as: 'not aware'; 'not engaged'; 'some engagement'; and 'high engagement', according to responses to survey questions concerning engagement with biodiversity loss, as described in the background section below.
3. These figures are provisional and subject to change once final datasets become available.

Source: Department of the Environment Northern Ireland, Natural England, Scottish Natural Heritage.

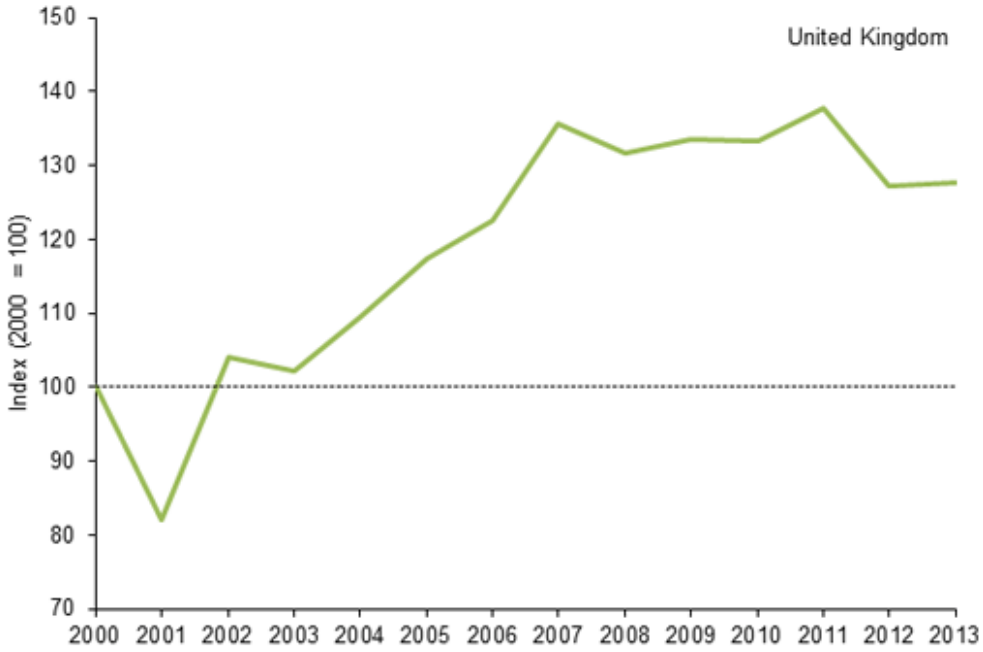
Assessment of change in the percentage of people highly engaged with the issue of biodiversity loss			
	Long term	**Short term**	**Latest year**
Percentage of people highly engaged			Not assessed

- In 2014, 7 per cent of people across Scotland, England and Northern Ireland were highly engaged with the issue of biodiversity loss. These are people who are aware of the threat to biodiversity in the UK, are concerned about the loss of biodiversity and take actions to support and protect biodiversity.
- Among these people, 1 per cent were performing 'higher effort' actions, such as volunteering with conservation organisations, which require the participant to act outside the realms of regular daily life and have the capability to persuade others and lead to changes that might impact on biodiversity loss.
- 12 per cent of people are aware of the threat to biodiversity, but are not concerned about it, while 41 per cent of people are aware of the threat to biodiversity and are concerned about it, but take little action to support or protect it.
- 40 per cent of survey respondents stated that they were not aware of the threat to biodiversity in the UK.

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 2013.



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.
2. Interpolated estimates (based on trends reported by other organisations) have been used to fill missing years for the Canal & River Trust (formerly British Waterways) (2000–2009), Butterfly Conservation (2000–2002), The Conservation Volunteers (2000–2005), Loch Lomond and The Trossachs National Park Authority (2000–2001, 2003), National Parks England (2000–2008), Natural England (2000, 2002), Plantlife (2000–2006), The Wildlife Trusts (2000–2005, 2010 and 2013), and the Woodland Trust (2000–2001).
3. Data provided by the The Conservation Volunteers, Loch Lomond and The Trossachs National Park Authority, Natural England, the Canal & River Trust (formerly British

Waterways), National Parks England, and RSPB were for financial years rather than calendar years. Financial year data have been assigned to the first calendar year (e.g. 2011/12 data were allocated to 2011).

Source: Bat Conservation Trust, Botanical Society of Britain and Ireland, The Conservation Volunteers, British Trust for Ornithology, Butterfly Conservation, Canal & River Trust (formerly British Waterways), Loch Lomond and The Trossachs National Park Authority, Natural England, National Parks England, Plantlife, RSPB, The Wildlife Trusts, Woodland Trust.

Assessment of change in volunteer time spent in conservation			
	Long term	Short term	Latest year
Conservation volunteering	 2000–2013	 2008–2013	No change (2013)

- 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 2013 the amount of time contributed by volunteers has increased by 34 per cent, but in the five years to 2013 it decreased by 4 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 2013.

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.

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 impacts. 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. Further research was undertaken in 2014 to further develop this approach.

In combination, these projects have defined what data are available on biomass flows into the UK economy, and the scope for undertaking the same analysis at country level using Scotland as a model. However further improvements to the models are needed before indicators can be developed.

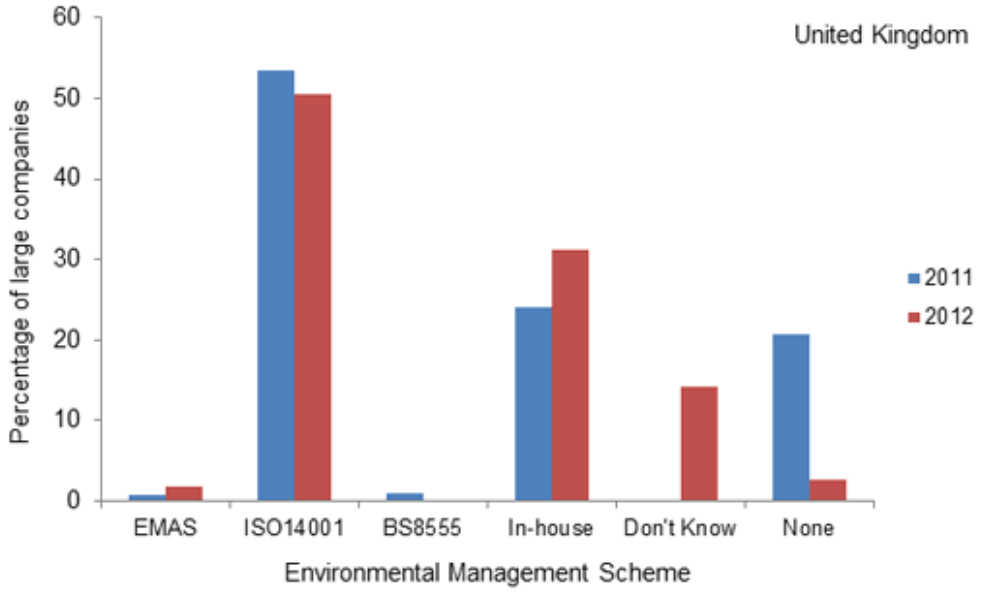
A5. Integration of biodiversity considerations into business activity

a. Environmental Management Systems

b. Environmental consideration in supply chains

Type: Response indicator

Figure A5ai. Percentage of large companies surveyed in the Environmental Protection Expenditure survey that use an Environmental Management System, 2011 to 2012.



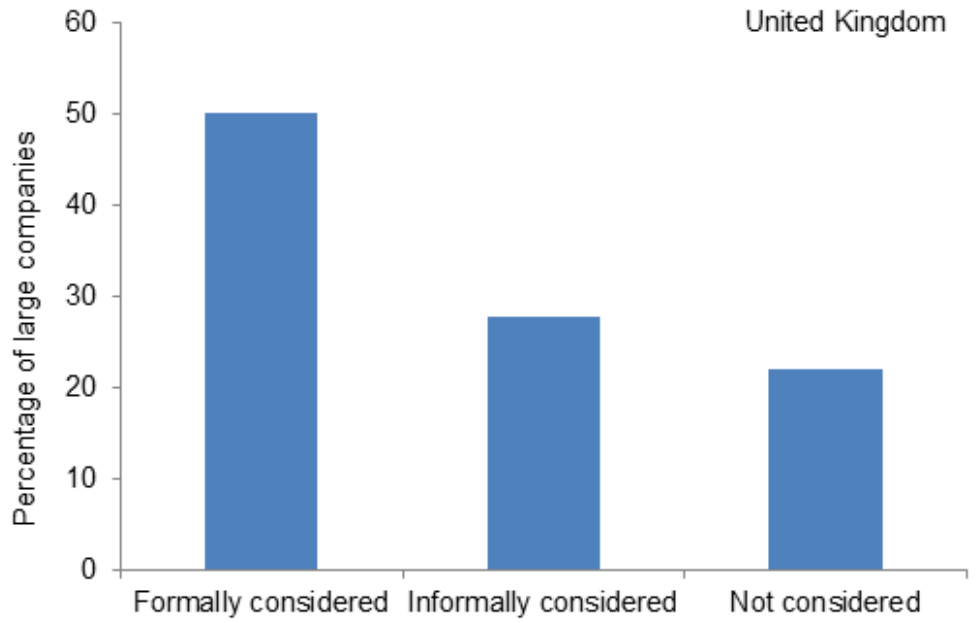
Notes:

1. As companies can have multiple systems in place, a hierarchy (EMAS > ISO 14001 > BS 8555 > In-house) has been applied to avoid double counting.

2. Weighted percentages based on responses from 121 large companies in 2012 and 127 large companies in 2012.
3. 'Large companies' are those that employ more than 250 staff.
4. 'Don't know' was not given as a response option in the 2011 survey.

Source: Defra.

Figure A5bi. Percentage of large companies surveyed in the Environmental Protection Expenditure survey that consider environmental issues in their supply chain, 2012.



Notes:

1. Weighted percentages based on responses from 120 large companies.
2. 'Large companies' are those that employ more than 250 staff.

Source: Defra.

Assessment of change in biodiversity considerations in business activity			
	Long term	Short term	Latest year
Percentage of large companies that use an Environmental Management Scheme (EMS)			Not Assessed (2012)
Percentage of companies where the environment is formally considered in the supply chain			Not Assessed (2012)

- 83 per cent of responding large companies (companies with more than 250 employees) had an Environmental Management System (EMS) in place in 2012, compared to 79 per cent in 2011.
- In 2012, just over half of responding large companies had an EMS certified to ISO 14001 (51 per cent), and a small number were certified to Eco-Management and Auditing Scheme (EMAS) (2 per cent).

- Overall, 31 per cent of respondents in 2012 had an EMS in place which was not externally certified (i.e. it was developed and implemented to meet “in-house” needs). 19 per cent were written, while 12 per cent were informal. A comparison of written and informal in-house EMSs is not possible for 2011.
- Overall, 78 per cent of large companies considered environmental issues within their supply chain in 2012 (50 per cent formally, 28 per cent informally); 22 per cent did not consider environmental issues at all.

B1. Agricultural and forest area under environmental management schemes

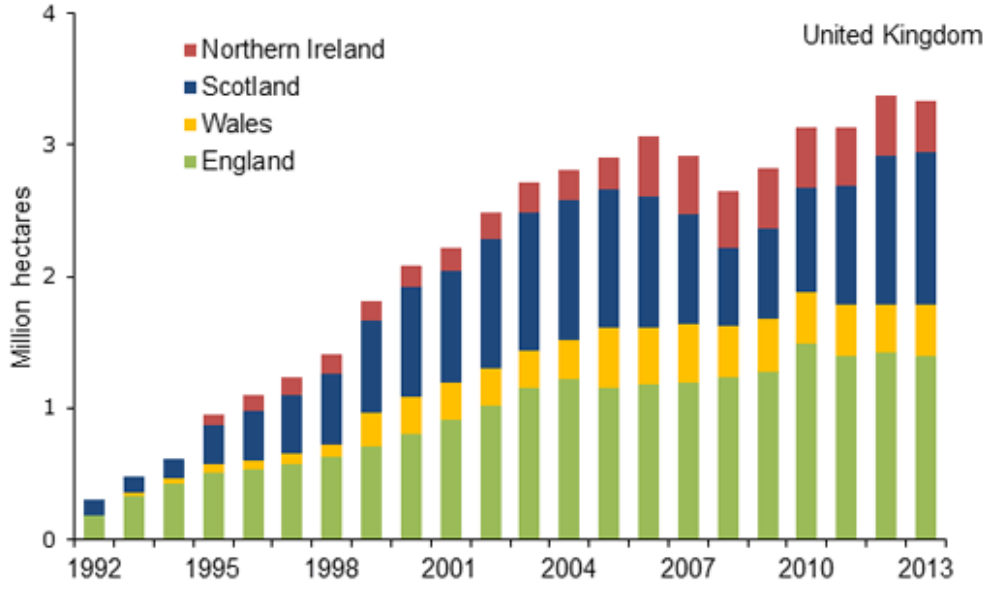
a. Area of land in agri-environment schemes

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 2013.

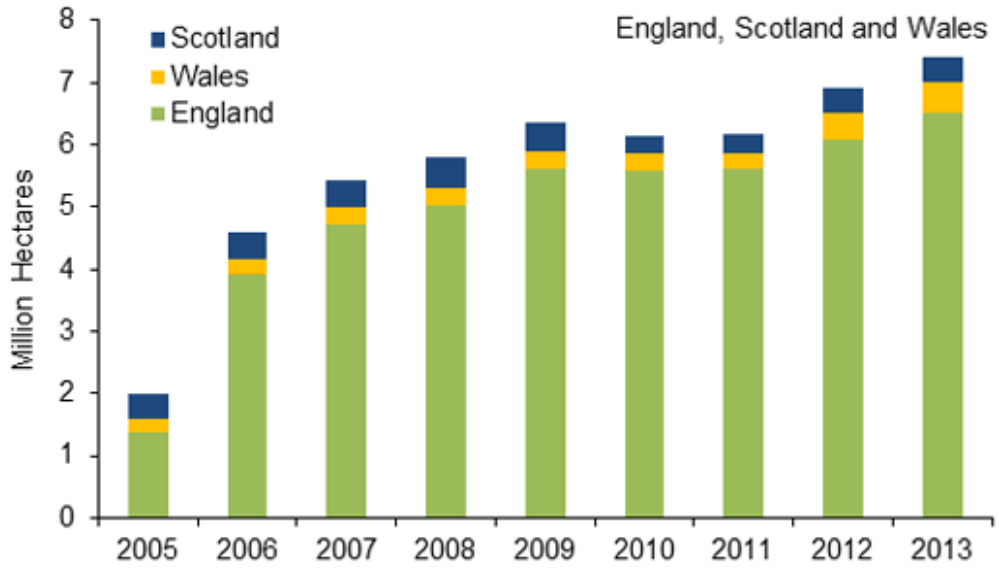


Notes:

1. The following schemes have been included as higher-level or targeted agri-environment schemes:
   England: Environmentally Sensitive Areas (ESA), Countryside Stewardship (CS), Higher Level Stewardship (HLS).
   Scotland: ESA, Countryside Premium, Rural Stewardship (HLS), Rural Priorities (RP).
   Wales: ESA, Tir Cymen, Tir Gofal, Glastir Advanced.
   Northern 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.

Figure B1aii. Area of land covered by entry-level type, whole-farm agri-environment schemes, 2005 to 2013.



Notes:

1. The following have been included here as entry-level type schemes:
   England: Entry Level Stewardship Scheme.
   Scotland: Land Management Contracts (previously Menu Scheme), Land Managers Options Schemes, Habitat Scheme.
   Wales: Tir Cynnal, Glastir Entry.
2. 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.

Assessment of change in area of land covered by agri-environment schemes			
	Long term	**Short term**	**Latest year**
Higher-level or targeted schemes	✓ 1992–2013	✓ 2008–2013	No change (2013)
Entry-level type, whole-farm schemes	…	✓ 2008–2013	Increased (2013)

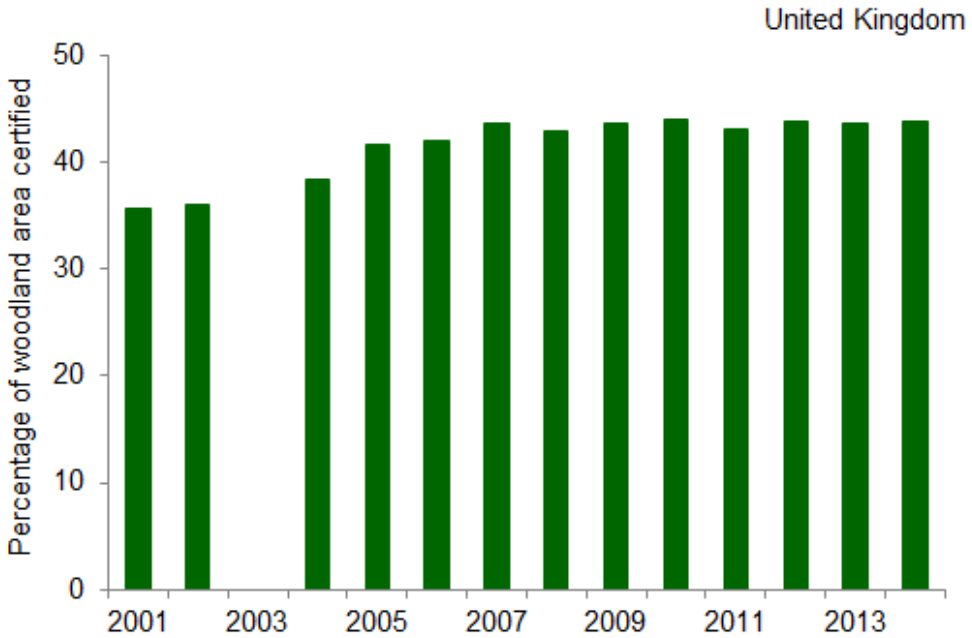
- Agri-environment schemes require farmers to implement environmentally-beneficial management and demonstrate good environmental practice on their farm.
- The higher-level or targeted schemes promote environmental management aimed to: conserve wildlife; maintain and enhance landscape quality and character; 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 2013 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 was 15 per cent in England; 25 per cent in Wales; 21 per cent in Scotland; and 37 per cent in Northern Ireland.
- In 2013 the total area of land in entry-level type schemes in England, Scotland and Wales was 7.4 million hectares. In the individual countries the proportion of agricultural land managed under entry-level schemes amounts to 72 per cent in England; 32 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 2014.



Notes: Figures relate to certificates that were valid up to 31 March 2014.

Source: Forestry Commission.

Assessment of change in area of woodland certified as sustainably managed			
	Long term	Short term	Latest year
Percentage of woodland certified	2001–2014	2009–2014	No change (2014)

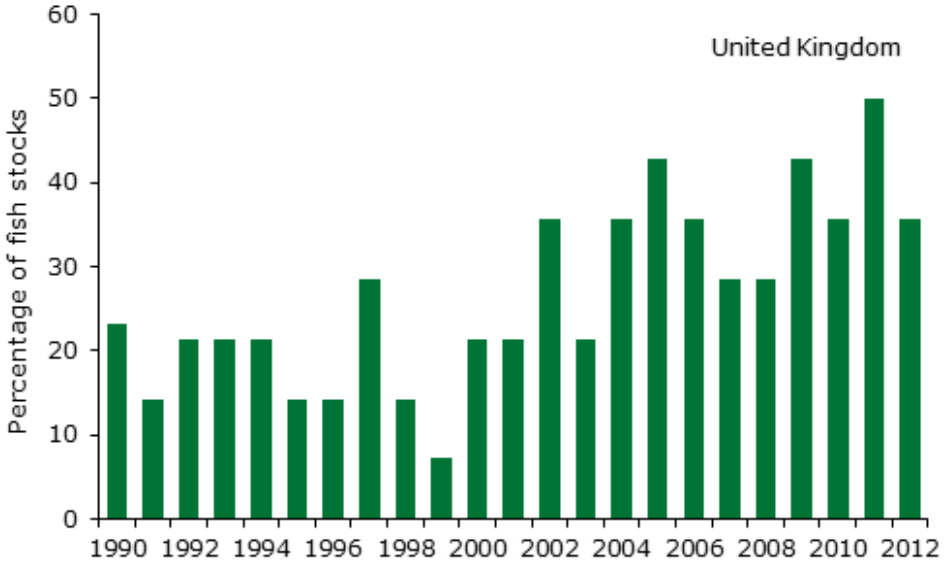
- Certification of woodlands promotes responsible forest management to safeguard forests' natural heritage and protect threatened species. The total area certified can change if new woodlands are certified, if existing certificate holders decide not to renew, or if there is a delay in renewal of an existing certificate.

- Across the UK, the percentage of woodlands under certified sustainable management schemes remained constant between 2013 and 2014 at 44 per cent.
- Within the UK in 2014, the percentage of woodlands certified as sustainably managed was 27 per cent in England, 46 per cent in Wales, 58 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 before 2013.

B2. Sustainable fisheries

Type: Pressure Indicator

Figure B2i. Percentage of fish stocks harvested sustainably and at full reproductive capacity, 1990 to 2012.



Notes: Based on 14 stocks for which accurate time series are available derived from stock assessment reports.

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

Assessment of change in stocks harvested sustainably and at full reproductive capacity			
	Long term	Short term	Latest year
Sustainable fisheries	1990–2012	2007–2012	Decreased (2012)

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

- In 2012 36 per cent of the assessed fish stocks around the UK (5 of the 14 stocks) were at full reproductive capacity and were being harvested sustainably. Since 2000, between 2 and 7 of the fish stocks around the UK have been at full reproductive capacity and being harvested sustainably, compared to between 1 and 4 stocks in the years from 1990 to 1999.
- There has been a progressive increase during the 2000s in the percentage of fish stocks harvested sustainably and at full reproductive capacity

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 climate change adaptation indicators need to cover are highlighted by the England Biodiversity Strategy Climate Change Adaptation Principles, 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, these principles include many elements that are neither new nor specific to climate change adaptation.

Following on from detailed consideration by UK specialists, review through the 6th UK Biodiversity Indicators Forum and decision by the UK Biodiversity Indicators Steering Group, two measures were chosen for delivery as indicators of climate change adaptation:

A. water stress in protected areas

B. gains and losses in coastal habitats (including intertidal and saltmarsh)

Detailed work is necessary to collate UK level data for these measures; it is planned to publish new measures in 2015.

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 2014.

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

Source: 1891 to 1947 Royal Meteorological Society; 1999 to 2014 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 2014 data by the UK Phenology Network.
- Since 1999, the annual mean observation dates have been around 7 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^{o}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

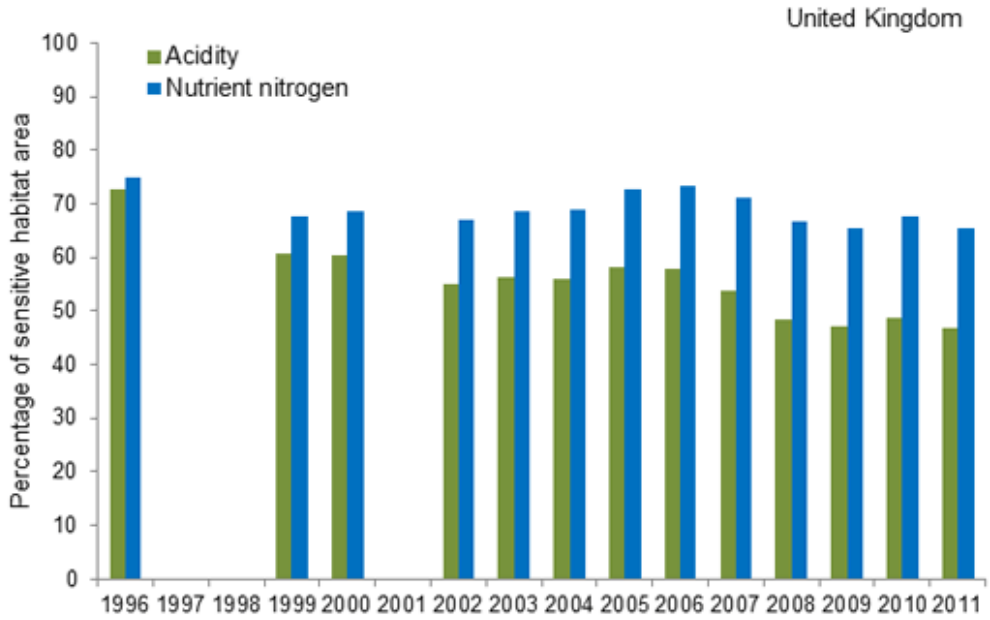
a. Air pollution

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 2011.



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 & Hydrology.

Assessment of change in area of sensitive habitat exceeding critical loads			
	Long term	Short term	Latest year
Area affected by acidity	1996–2011	2006–2011	Decreased (2011)
Area affected by nitrogen	1996–2011	2006–2011	Decreased (2011)

- 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, industry, road transport, and emissions

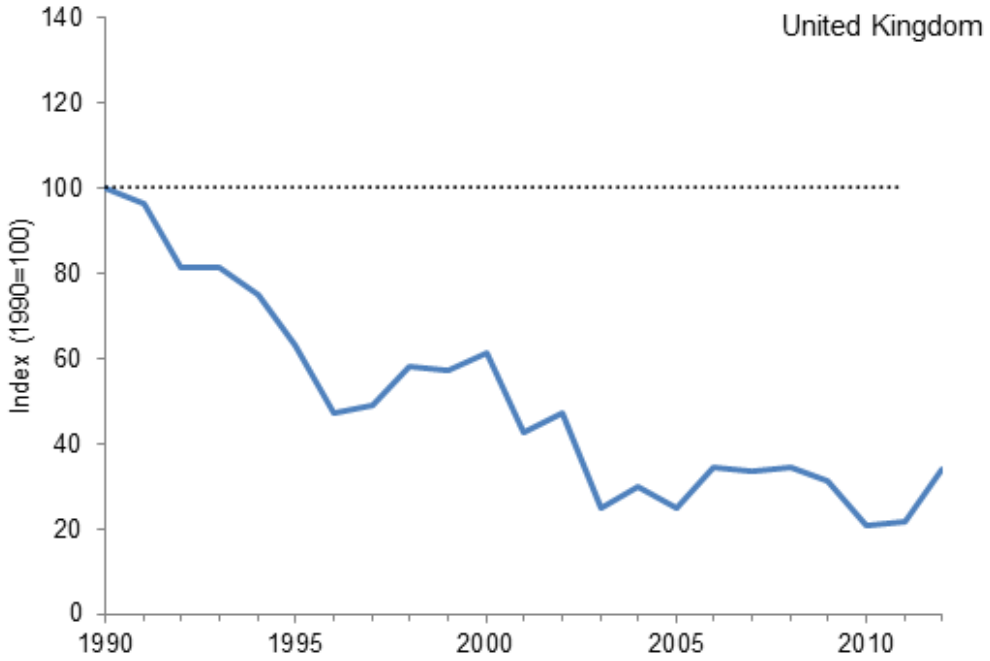
from livestock waste. Around a third of UK land area is sensitive to acidification, and a third to eutrophication (with some areas sensitive to both).

- In 1996, acid deposition exceeded critical loads in 73 per cent of the area of sensitive habitats. This declined to 47 per cent in 2011. There has also been a decrease in the area affected over the short term, since 2006 when the figure was 58 per cent.
- In 2011, nitrogen deposition exceeded critical loads in 65 per cent of sensitive habitats. This was a decrease from a level of 75 per cent in 1996. There was also a decrease between 2006 (73 per cent) and 2011.

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 2012.



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

Assessment of change in input of hazardous substances			
	Long term	Short term	Latest year
Combined input of hazardous substances	1990–2012	2007–2012	Increased (2012)

- 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 2012. Inputs of three substances (cadmium, lindane and mercury) declined by more than 70 per cent over this time period, while zinc has declined by 51 percent; copper by 44 per cent and lead by 7 per cent.

- In the short term, between 2007 and 2012, inputs of four substances declined, while inputs of lead and lindane have increased. The index as a whole has remained stable over this time period. However, inputs of all six substances increased between 2011 and 2012.

B6. Pressure from invasive species

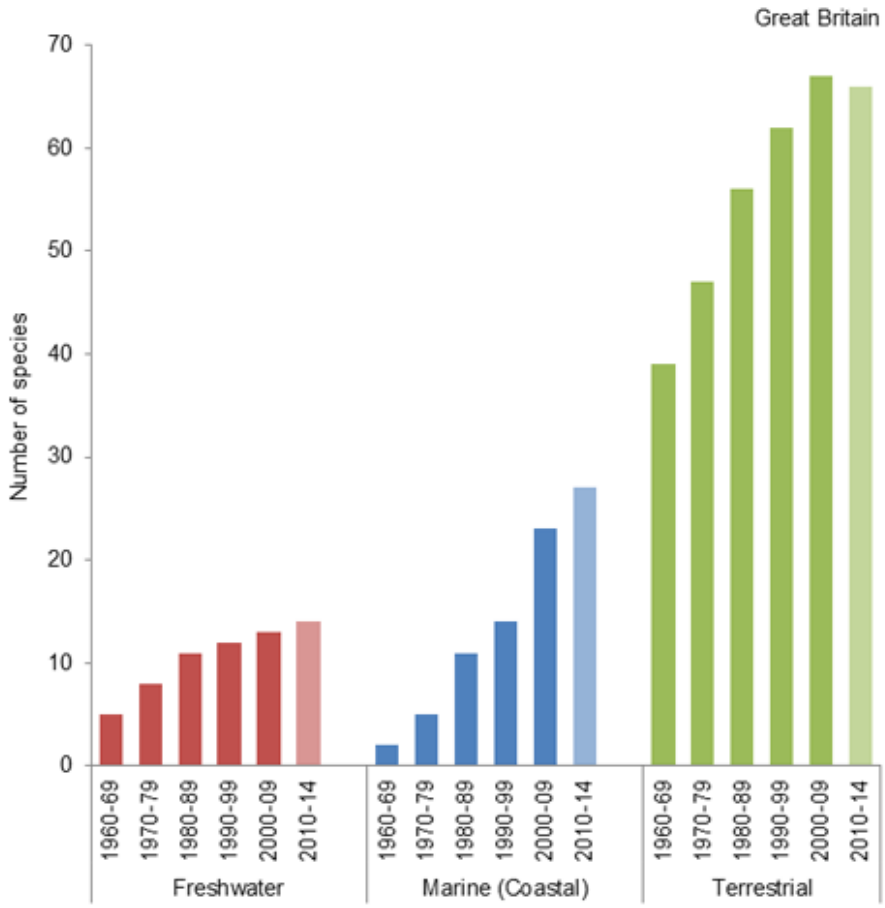
a. Freshwater invasive species

b. Marine (coastal) invasive species

c. Terrestrial invasive species

Type: Pressure Indicator

Figure B6i. Number of non-native invasive species established in or along more than 10 per cent of Great Britain's land area or coastline, 1960 to 2014.



Notes: The last time period covers a shorter period than the other bars (2010-2014).

Source: Botanical Society of Britain and Ireland, British Trust for Ornithology, Centre for Ecology & Hydrology, Marine Biological Association, National Biodiversity Network Gateway.

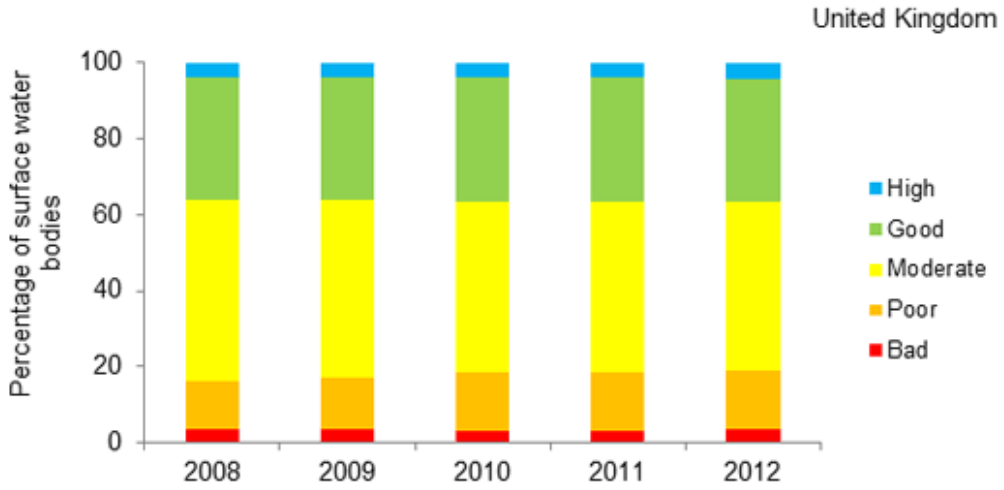
Assessment of change in the number of non-native invasive species established in or along more than 10 per cent of Great Britain's land area or coastline			
	Long term	Short term	Latest year
Freshwater invasive species	 1960-2014	Not Assessed	Not Assessed
Marine (coastal) invasive species	 1960-2014	Not Assessed	Not Assessed
Terrestrial invasive species	 1960-2014	Not Assessed	Not Assessed

- Non-native species are those that have reached Great Britain by accidental human transport, deliberate human introduction, or which arrived by natural dispersal from a non-native population in Europe. Species that arrived since 1500 are considered.
- Most non-native species are considered benign or positive but some 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 1960-2014, non-native species have become more prevalent in the countryside.
- Of the 3,050 non-native species recorded in Great Britain, 1,919 are considered to be established; and of those, 179 are considered to be exerting a negative impact on native biodiversity in Great Britain. The number of these 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 (coastal) environments, increasing the likely pressure on native biodiversity.

B7. Surface water status

Type: State Indicator

Figure B7i. Status classification of UK surface water bodies under the Water Framework Directive, 2008 to 2012.



Notes:

1. Based on numbers of surface water bodies classified under the Water Framework Directive in England, Wales, Scotland and Northern Ireland. Includes rivers, canals (Northern Ireland does not report on canals), lakes, estuaries and coastal water bodies.
2. A water body is a management unit, as defined by the relevant authorities.
3. Percentage of water bodies in each status class has been calculated based on the total number of water bodies assessed in each year.
4. Number of water bodies assessed varies slightly from year to year: in 2008 10,832 water bodies were assessed, in 2009 10,761 water bodies, in 2010 10,782, in 2011 10,704 and in 2012 10,763.
5. Water bodies that are heavily modified or artificial (HMAWBs) are included in this indicator alongside natural water bodies. HMAWBs are classified as high, good, moderate, poor or bad 'ecological potential'. Results have been combined; for example, the number of water bodies with a high status class has been added to the number of HMAWBs with high ecological potential.

Source: Department of the Environment for Northern Ireland, Environment Agency, Natural Resources Wales, Scottish Environment Protection Agency.

Assessment of change in 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	≈ 2008 – 2012	No change (2012)

- There was no significant change in the overall number of water bodies awarded high or good surface water status between 2008 and 2012. In 2012, 36.6 per cent of surface water bodies assessed under the WFD in the UK were in high or good status.

C1. Protected areas

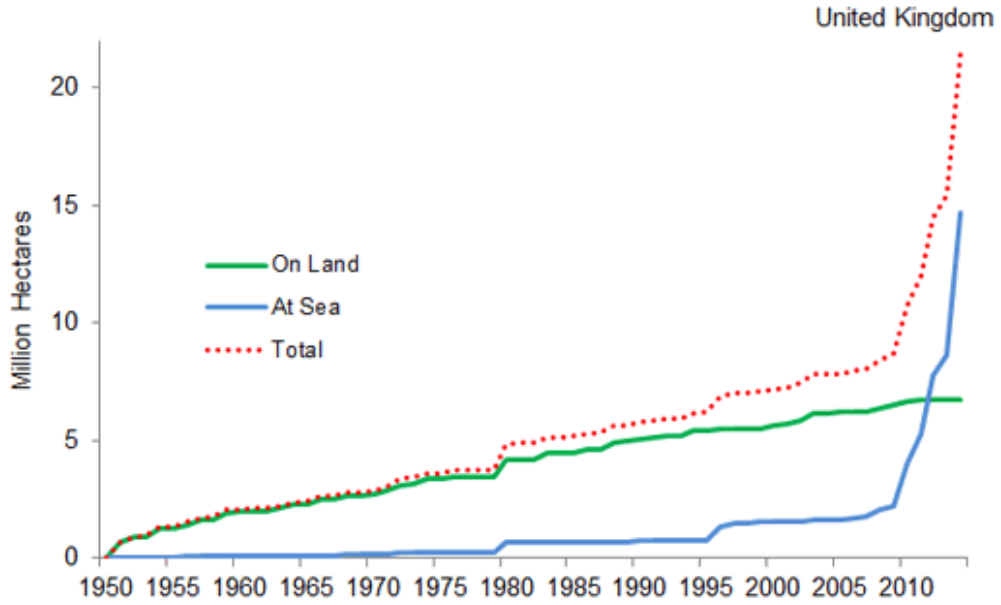
a. Total area of protected areas: on-land

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 2014.

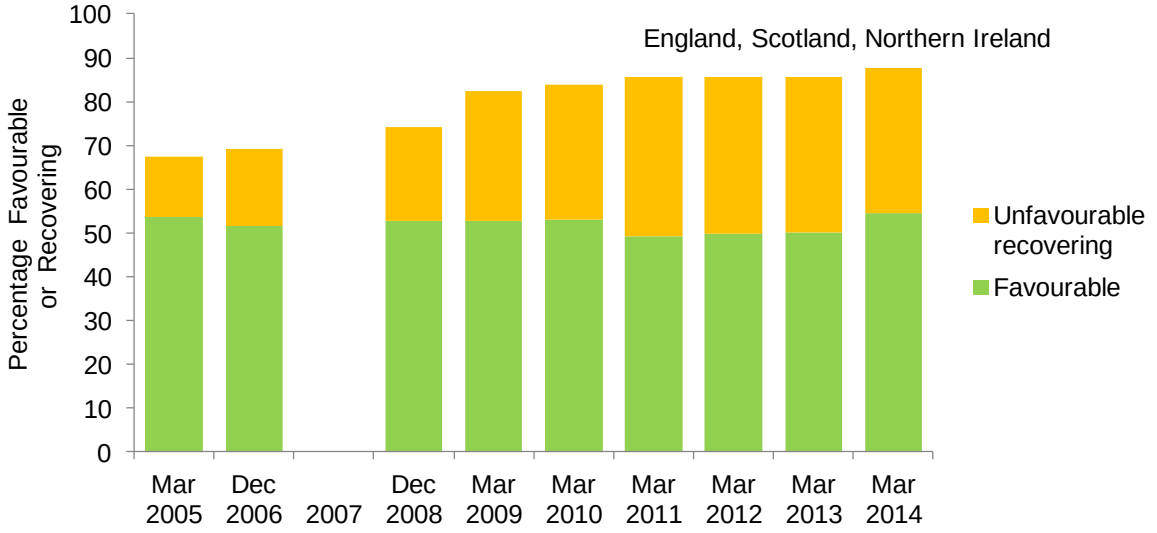


Notes:

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' if 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. For 2014 data only extend to 7 August (the date of designation of Scottish Nature Conservation Marine Protected Areas).
3. The 2013 indicator included 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 2014 indicator uses the same method. The indicator for the last two years 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 Importance), Special Protection Areas, Ramsar Sites, Marine Conservation Zones, Nature Conservation Marine Protected 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, 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 2014.



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. Data were not collated in 2007.
3. Imputation has been used to calculate the breakdown between favourable and unfavourable-recovering for Northern Ireland for the years 2009 to 2011.
4. 'Recovering' is used in the graph above, and throughout the document, as 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	✓ 1950–2014	✓ 2009–2014	No change (2014)
Total extent of protected areas at-sea	✓ 1950–2014	✓ 2009–2014	Increased (2014)
Condition of A/SSSIs	…	✓ 2008/09–2013/14	Increased (2013-14)

- 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 12.7 million hectares, from 8.7 million hectares in December 2009 to 21.4 million hectares at the start of August 2014.
- 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 designation of marine

conservation zones in English and Welsh waters, and designation of nature conservation marine protected areas in Scottish Waters. The area of protected areas at-sea increased by 12.5 million hectares between 2009 and 2014. The extent of protected areas on-land has increased by 212,000 hectares since 2009, mainly due to the designation in 2010 of six large Special Protection Areas in Scotland for golden eagle.

- 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').
- The percentage of features, or area, of A/SSSIs in favourable or recovering condition increased from 67 per cent in 2005 to 83 per cent in 2009 and to 88 per cent in 2014. The proportion of features or area of land in unfavourable-recovering condition has increased from 14 per cent in 2005 to 33 per cent in 2014. 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

Indicator under development – progress to date

A measure of connectivity has been published previously within the biodiversity indicators set, based on an analysis of changes in land cover recorded in the 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. The measure required further analysis to better explain the causes of the changes in connectivity and, as a result, the information available was insufficient for an assessment of change to be made, despite the statistically significant increase seen in connectivity in neutral grassland habitat observed. It has not been possible to undertake the analysis required and, given the latest data available for the indicator is from 2007, it has been decided by the UK Biodiversity Indicator Steering Group that this indicator is now too out-of-date to be retained within the indicator set, and the previous data and analysis has been moved to the background.

Consideration is being given to whether information on changes in distribution of species known to be sensitive to habitat fragmentation can be used as a proxy measure of changes in connectivity. This requires consideration of the ecology of species and detailed modelling of changes in distribution observed. It is hoped that a new interim measure can be published in 2015.

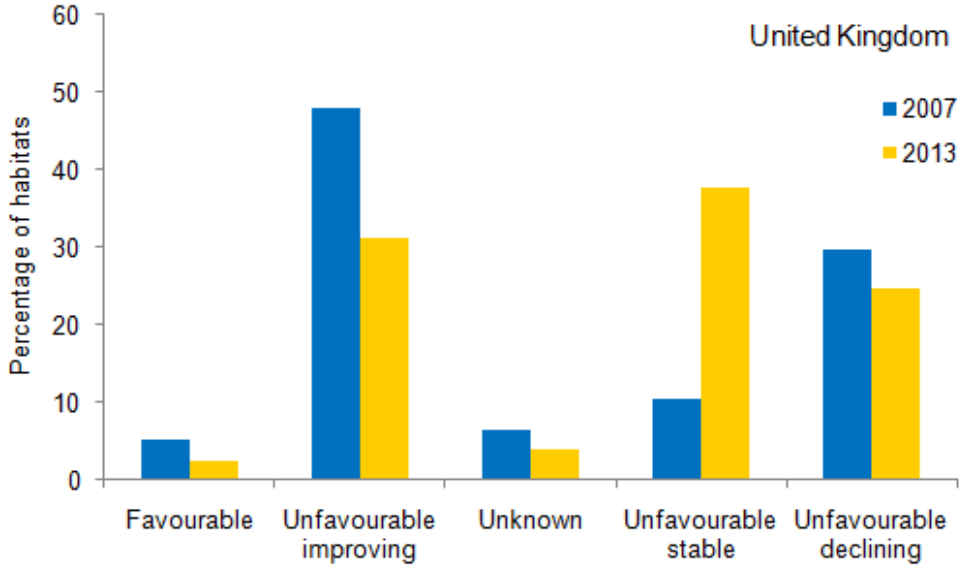
In the longer term, there may be opportunities to produce an indicator of habitat connectivity based on earth observation satellite data.

C3. Status of European habitats and species

a. Status of UK 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.

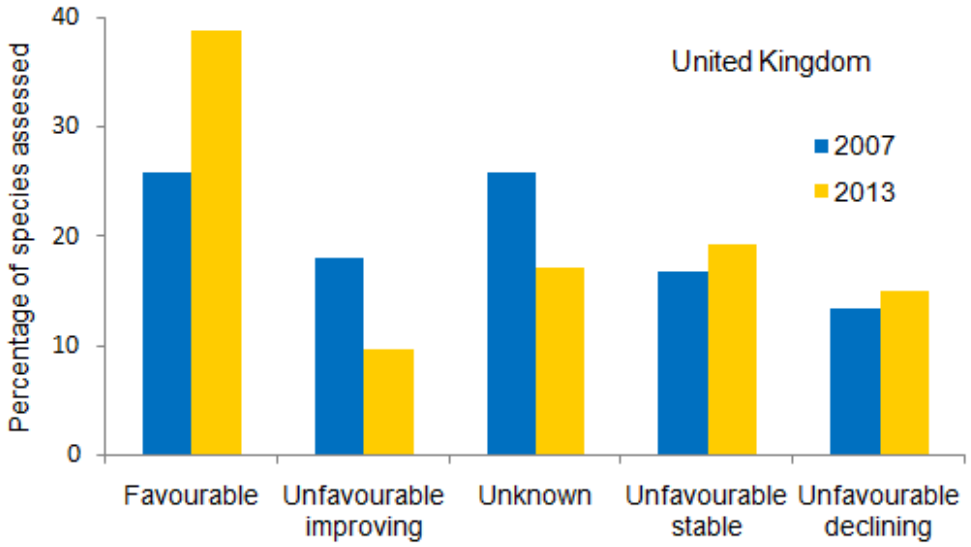
- In 2007 5 per cent of UK habitats listed on Annex I of the Habitats Directive were in favourable conservation status, declining to 3 per cent in 2013.
- The conservation status of 48 per cent of habitats was improving in 2007. In 2013, 31 per cent were improving.
- The conservation status of 30 per 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.

b. Status of UK species of European importance

Type: State Indicator

Figure C3bi. Percentage of UK species of European importance in improving or declining conservation status in 2007 and 2013.



Notes:

1. The number of species assessed was 89 in 2007, and 93 in 2013.
2. Graph based on species listed on Annexes II, IV and V of the Habitats Directive, but excluding vagrants.
3. 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 UK species listed on Annexes II, IV or V of the Habitats Directive were in favourable conservation status, increasing to 39 per cent in 2013.

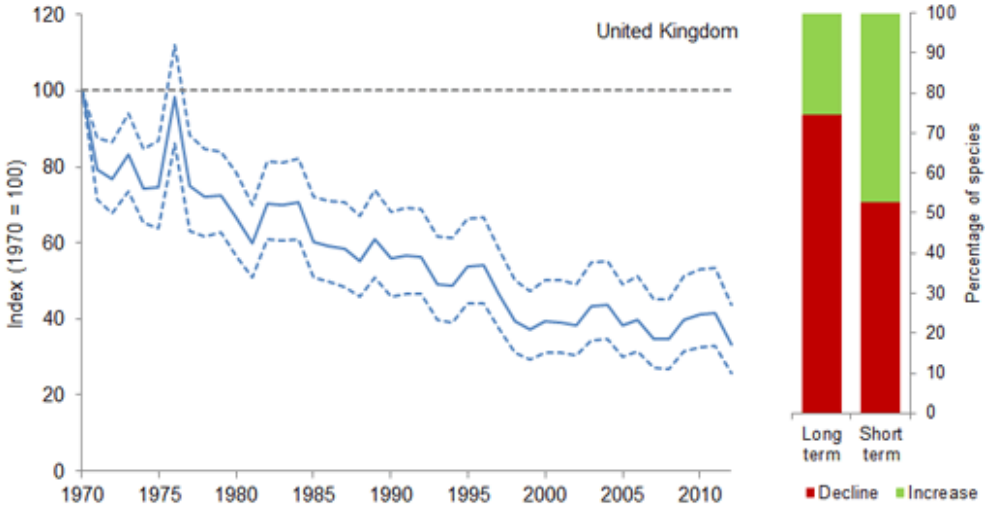
- The conservation status of 18 per cent of species was improving in 2007. In 2013, 10 per cent were improving.
- The conservation status of 13 per cent of the species was declining in 2007. In 2013, 15 per cent were declining.
- The information sources on which the assessments are based vary between 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.

C4. Status of UK priority species

a. Status of priority species – relative abundance

Type: State Indicator

Figure C4ai. Change in the relative abundance of priority species in the UK, 1970 to 2012.



Notes:

1. Based on 213 species. Dashed lines show the 95 per cent confidence intervals relative to the 1970 reference year.
2. Bar chart shows the percentage of species increasing or declining over the long-term (1970 to 2012) and the short-term (2007 to 2012).
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.

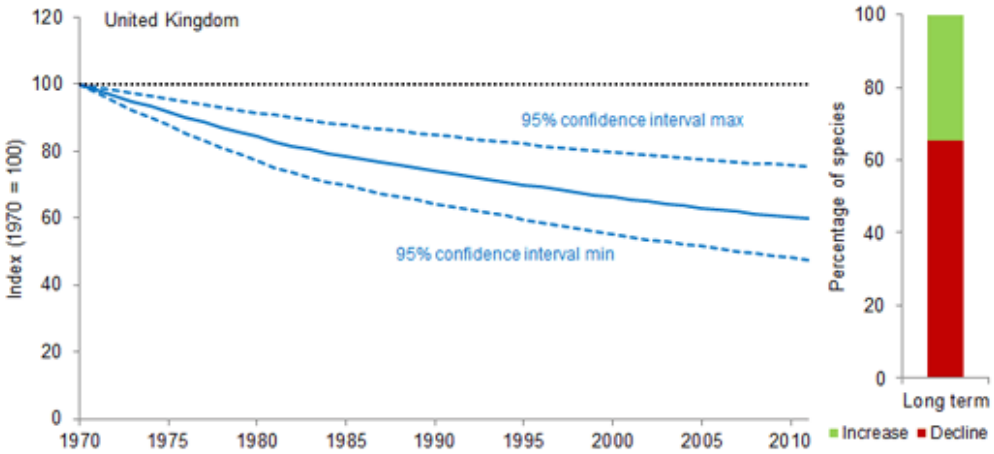
Assessment of change in the relative abundance of priority species in the UK			
	Long term	Short term	Latest year
Relative abundance of priority species	1970–2012	2007–2012	Decreased (2012)

- 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 biodiversity or environment strategies. The species included in the indicator are those on one or more of these priority species lists, for which population abundance data are available.
- By 2012, populations of priority species overall had declined to 33 per cent of the 1970 index value, a statistically significant decrease. Within this and over this long term period 25 per cent of species showed an increase and 75 per cent showed a decline.
- Between 2007 and 2012, populations of priority species declined by four per cent relative to their value in 2007. This decrease is not statistically significant. Within the index over this short term period, 47 per cent of species showed an increase and 53 per cent showed a decline.
- The measure is a composite indicator of trends in 213 species from the following taxonomic groups: 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 fully representative of species in the wider countryside. The time series that 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 priority species – frequency of occurrence - insects

Type: State Indicator

Figure C4bi. Change in frequency of occurrence of priority species, 1970 to 2011.



Notes:

1. Based on 179 species of insect.
2. Bar chart shows the percentage of species increasing or declining over the long-term (1970 to 2011).

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: Bees, Wasps and Ants Recording Society, British Dragonfly Society, Biological Records Centre (supported by the Centre for Ecology & Hydrology and the Joint Nature Conservation Committee), Butterfly Conservation, Hoverfly Recording Scheme, Orthoptera Recording Scheme.

Assessment of change in status of priority species in the UK			
	Long term	**Short term**	**Latest year**
Status of priority species – frequency of occurrence – insects	 1970-2011	Not Assessed	Not Assessed

Note: Short term and latest year assessments cannot be given as the analytical technique currently used is not appropriate for the production of short term trends.

- 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 biodiversity or environment strategies. The species included in the indicator are those on one or more of these priority species lists for which biological records are available.
- This indicator uses biological records to quantify changes in the frequency of occurrence of priority species for which there are sufficient data to identify a trend.
- Between 1970 and 2011, the frequency of occurrence of those priority species included in this indicator declined to 60 per cent of its value in 1970.
- Over this time period, 65 per cent of species experienced a decline and 35 per cent experienced an increase in their frequency of occurrence.
- The measure is a composite indicator of 179 species from the following taxonomic groups for which there are sufficient data to create a time series: moths, bees, wasps, ants, dragonflies, hoverflies and grasshoppers. These species 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 all species in the wider countryside. The time series have been combined to cover different time periods and were collected using different methods.

C5. Birds of the wider countryside and at sea

a. Farmland birds

b. Woodland birds

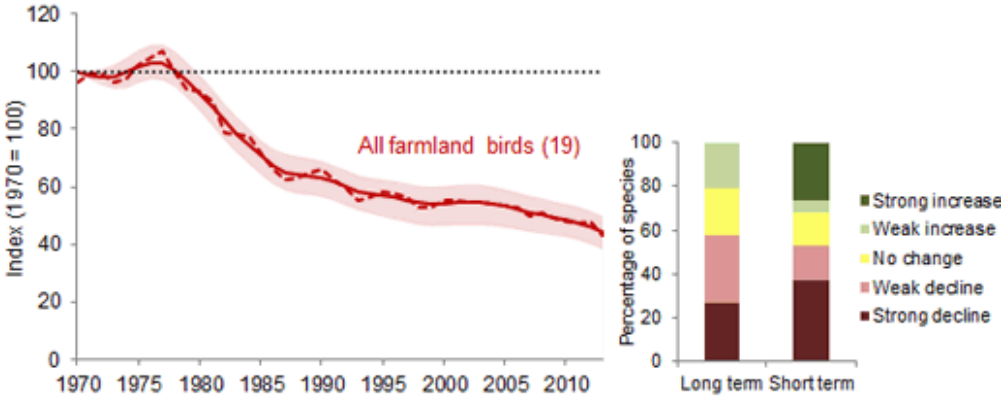
c. Wetland birds

d. Seabirds

e. Wintering water birds

Type: State Indicator

Figure C5ai. Breeding farmland birds in the UK, 1970 to 2013.

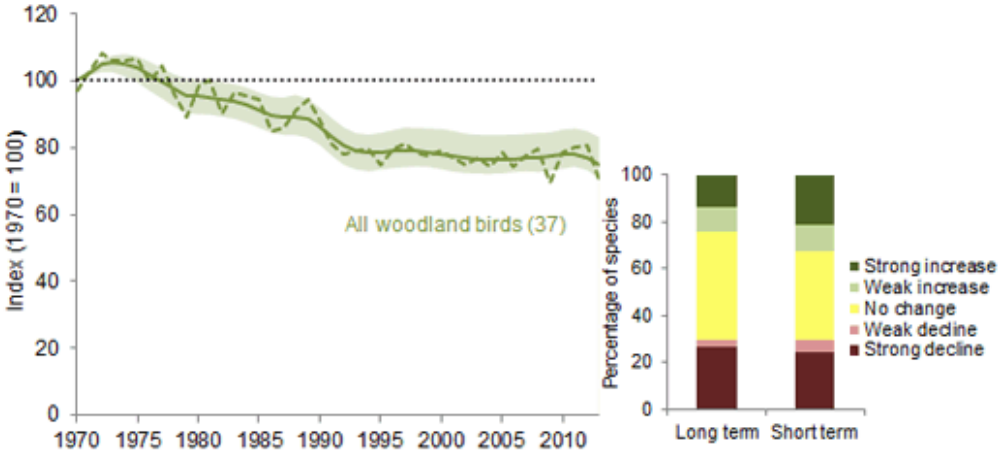


Notes:

1. Figure in brackets shows the number of species.
2. Graph shows unsmoothed trend (dashed line) and smoothed trend (solid line) with its 95 per cent confidence interval (shaded).
3. Bar chart shows the percentage of species within the indicator that have increased, decreased or shown no change, based on set thresholds of change.

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

Figure C5bi. Breeding woodland birds in the UK, 1970 to 2013.

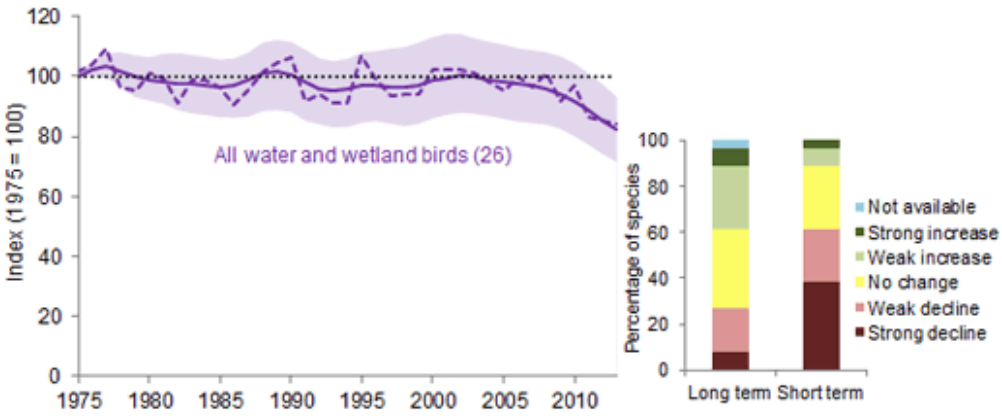


Notes:

1. Figure in brackets shows the number of species.
2. Graph shows unsmoothed trend (dashed line) and smoothed trend (solid line) with its 95 per cent confidence interval (shaded).
3. Bar chart shows the percentage of species within the indicator that have increased, decreased or shown no change, based on set thresholds of change.

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

Figure C5ci. Breeding water and wetland birds in the UK, 1975 to 2013.

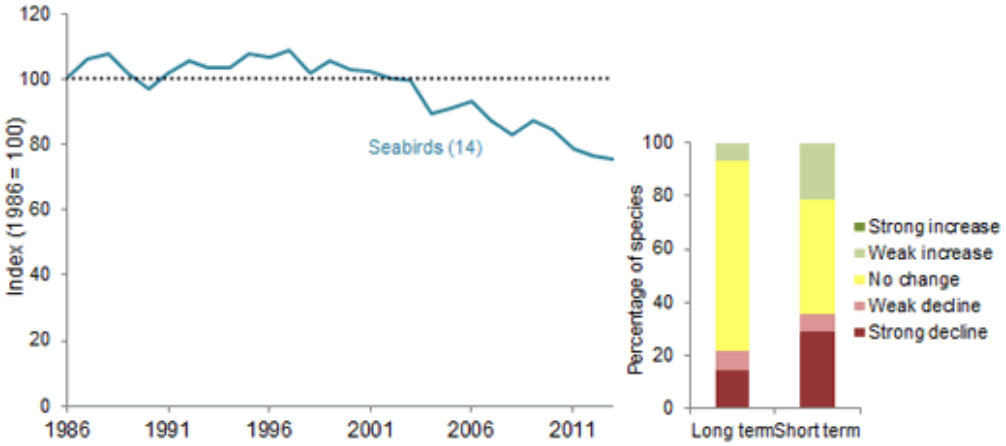


Notes:

1. Figure in brackets shows the number of species.
2. Graph shows unsmoothed trend (dashed line) and smoothed trend (solid line) with its 95 per cent confidence interval (shaded).
3. Bar chart shows the percentage of species within the indicator that have increased, decreased or shown no change, based on set thresholds of change.

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

Figure C5di. Breeding seabirds in the UK, 1986 to 2013.

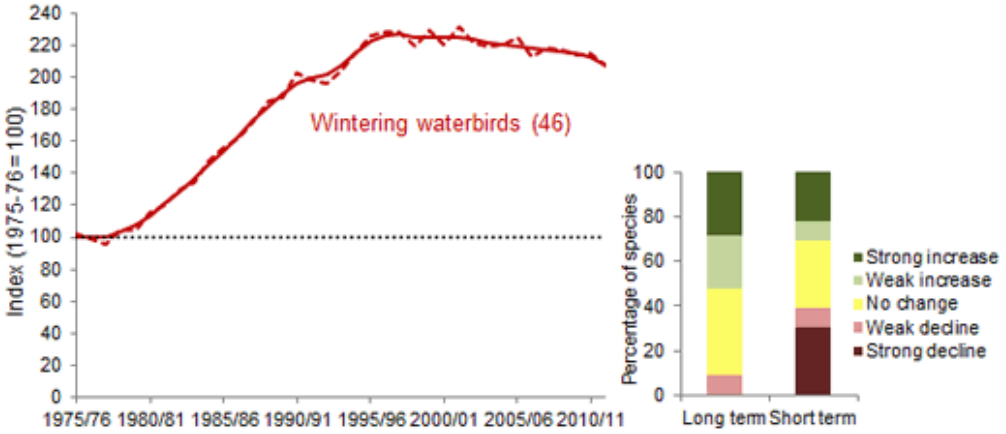


Notes:

1. Figure in brackets shows the number of species.
2. Graph shows unsmoothed trend (solid line) - no smoothed trend is available for seabirds as individual species population trends are analysed using an imputation procedure that does not include smoothing. As data are based on a mixture of full counts and sample sites, standard bootstrapping methods used for other indicators cannot be applied and the trend is presented without confidence intervals.
3. Bar chart shows the percentage of species within the indicator that have increased, decreased or shown no change, based on set thresholds of change.

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

Figure C5ei. Wintering waterbirds in the UK, 1975-76 to 2012-13.



Notes:

1. Figures in brackets shows the number of species.
2. Based on financial years.
3. Graph shows unsmoothed trend (dashed line) and smoothed trend (solid line).
4. Data from surveys of wintering waterbirds are based on full counts on wetland and coastal sites of markedly varying size. This means that standard indicator bootstrapping methods cannot be applied and the trend is presented without confidence intervals.
5. Bar chart shows the percentage of species within the indicator that have increased, decreased or shown no change, based on set thresholds of change.

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

Assessment of change in bird populations			
	Long term	**Short term**	**Latest year**
Farmland birds	 1970–2012	 2007–2012	Decreased (2013)
Woodland birds	 1970–2012	 2007–2012	Decreased (2013)
Wetland birds	 1975–2012	 2007–2012	No change (2013)
Seabirds	 1970–2013	 2008–2013	No change (2013)
Wintering waterbirds	 1975/76–2011/12	 2006/07–2011/12	Decreased (2012-13)

Notes: While percentage changes in these indices are reported based on the most recent unsmoothed data point (2013), the formal long- and short-term assessments of the statistical significance of these changes is are made using the smoothed data to 2012. This is because the most recent smoothed data point (for 2013) is likely to change in next year's update when additional data are included for 2014. Analysis of the underlying trends is undertaken by the data providers. Smoothed data are available for farmland, woodland, wetland and wintering waterbirds, but not for seabirds.

- Between 1970 and 2013, populations of breeding farmland and woodland birds decreased by 55 per cent and 28 per cent respectively. In 2013 breeding seabird populations were 24 per cent lower than their 1986 level, and the population index for breeding water and wetland birds was 17 per cent lower than in 1975. All of these changes are statistically significant.
- In the shorter-term, between 2007 and 2012, populations of woodland birds have remained stable, whilst farmland birds have shown a statistically significant decrease of 10 per cent, and water and wetland birds a significant decrease of 12 per cent. Seabirds have shown a significant decrease of nine per cent between 2008 and 2013.
- In 2012-13, populations of the wintering waterbirds were 95 per cent higher than in 1975-76. There has been a decline in more recent years since populations peaked in 2001-02, but the index has remained stable in the five years between 2006-07 and 2011-12.

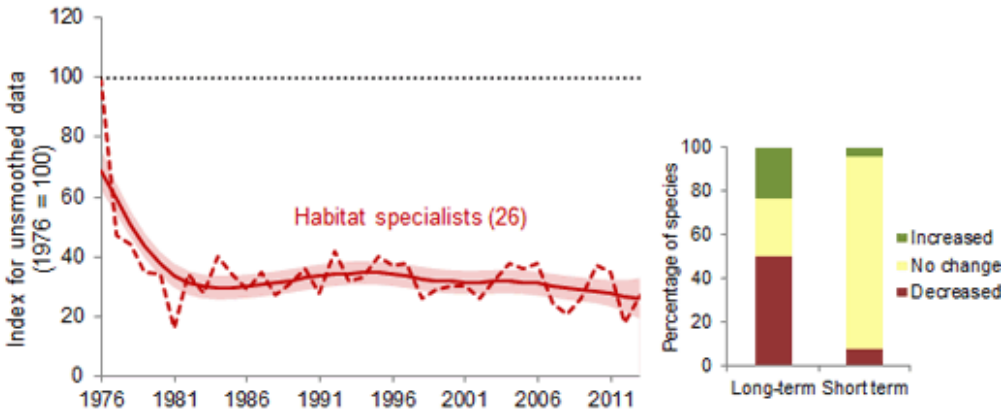
C6. Insects of the wider countryside (butterflies)

a. Semi-natural habitat specialists

b. Species of the wider countryside

Type: State Indicator

Figure C6ai. Trends in butterfly populations in the UK: habitat specialists, 1976 to 2013.

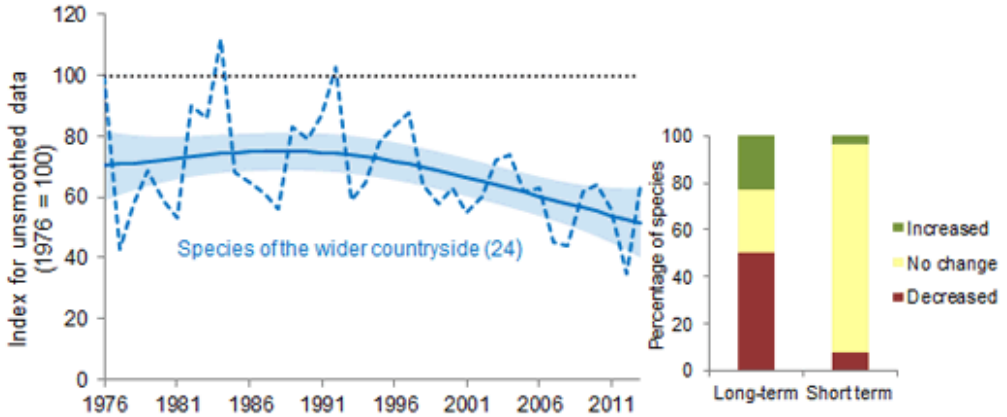


Notes:

1. Figure in brackets shows the number of species included in the index.
2. Graph shows unsmoothed trend (dashed line) and smoothed trend (solid line) with its 95 per cent confidence interval (shaded).
3. Bar chart shows the percentage of species within the indicator that have shown a statistically significant increase, statistically significant decrease or no change.

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

Figure C6bi. Trends in butterfly populations in the UK: species of the wider countryside, 1976 to 2013.



Notes:

1. Figure in brackets shows the number of species included in the index.
2. Graph shows unsmoothed trend (dashed line) and smoothed trend (solid line) with its 95 per cent confidence interval (shaded).

3. Bar chart shows the percentage of species within the indicator that have shown a statistically significant increase, statistically significant decrease or no change.

4. In 2013 an improved analysis method was applied to the measure for species of the wider countryside (see 'Background' section for further information).

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

Assessment of change in butterfly populations			
	Long term	**Short term**	**Latest year**
Semi-natural habitat specialists	1976–2013	2008–2013	Increased (2013)
Species of the wider countryside	1976–2013	2008–2013	Increased (2013)

- Since 1976, the indices for butterflies strongly associated with semi-natural habitats (habitat specialists) and for those found in the wider countryside have decreased by 73 per cent and 36 per cent respectively.
- Large fluctuations in numbers between years are typical features of butterfly populations. The statistical assessment of change is therefore made on an analysis of the underlying smoothed trends.
- This analysis shows that, since 1976, populations of habitat specialists and species of the wider countryside have declined significantly.
- The unsmoothed data for both the habitat specialist butterflies and species of the wider countryside show an increase between 2008 and 2013. However, the underlying analysis of the smoothed trend shows that these increases are not significant; there has been no overall change in either of the two indices in the five years to 2013.
- In the most recent year, 2013, habitat specialist butterflies increased by 9 per cent from the previous year, whilst wider countryside species increased by 29 per cent.

C7. Plants of the wider countryside

Indicator under development – progress to date

An indicator of plant species richness has been published previously within the biodiversity indicators set, based on an analysis of changes in land cover recorded in the Countryside Survey – a detailed periodic audit of a statistically representative sample of land across Great Britain. As the latest Countryside Survey data are from 2007, the data previously presented for this indicator is considered too out of date to be fit-for-purpose and retained within the indicator set as a headline measure: the UK Biodiversity Indicators Steering Group therefore took the decision to move this data and analysis to background.

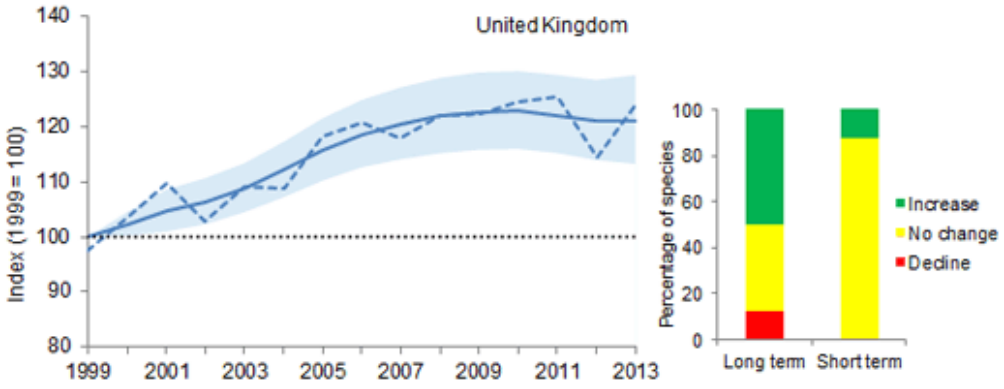
New analysis techniques that allow the derivation of individual plant species trend information from occurrence records may offer an opportunity to produce a new measure that can be updated more frequently, and cover a wider range of plant species. There are plans to publish a new interim measure on this basis in 2015.

In the slightly longer term it is hoped that a new plant monitoring scheme being developed by the Centre for Ecology and Hydrology, the Botanical Society of Britain and Ireland, Plantlife and the Joint Nature Conservation Committee will provide data more equivalent to those underpinning the birds, bats and butterfly indicators, allowing a more representative indicator of plant trends to be developed. Although data will start to be delivered within three years, it will not be possible to produce a trend before 2020 as time is needed to collect enough data to be able to calculate the statistical significance of the trend.

C8. Mammals of the wider countryside (bats)

Type: State Indicator

Figure C8i. Trends in bat populations, 1999 to 2013.



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. Graph shows unsmoothed trend (dashed line) and smoothed trend (solid line) with its 95% confidence interval (shaded).
3. The bar chart shows the percentage of species which, over the time period of the short-term or long-term assessment respectively, have shown a statistically significant increase or decrease.

Source: Bat Conservation Trust.

Assessment of change in widespread bat populations			
	Long term	**Short term**	**Latest year**
Bat populations	1999–2012	2007-2012	Increased (2013)

Note: Long term and short term assessments are made on the basis of smoothed trends to the penultimate year (2012) by the Bat Conservation Trust. This is because the most recent smoothed data point (2013) is likely to change in next year's update when additional data are included for 2014. The latest year assessment is based on unsmoothed data.

- Between 1999, when trends from standardised large-scale monitoring became available through the National Bat Monitoring Programme (NBMP), and 2012, bat populations have

increased by 18 per cent; an assessment of the underlying smoothed trend shows this is a statistically significant increase.

- In the short term, between 2007 and 2012, an assessment of the underlying smoothed trend shows that bat populations have shown a small, insignificant decrease of less than three per cent, and are therefore considered to be stable.
- Four species (50 per cent) have increased in the long-term; one species, soprano pipistrelle, has decreased. In the short term, between 2007 and 2012, seven of the eight species have shown no significant change in population size. Lesser horseshoe bats have shown a statistically significant increase.
- Bats have undergone severe declines historically. Data from roost counts of pipistrelle bats show there was a 60 per cent decline from 1977 to 1999 in England; assessment of the underlying smoothed trend shows this was a significant decrease.

C9. Genetic resources for food and agriculture

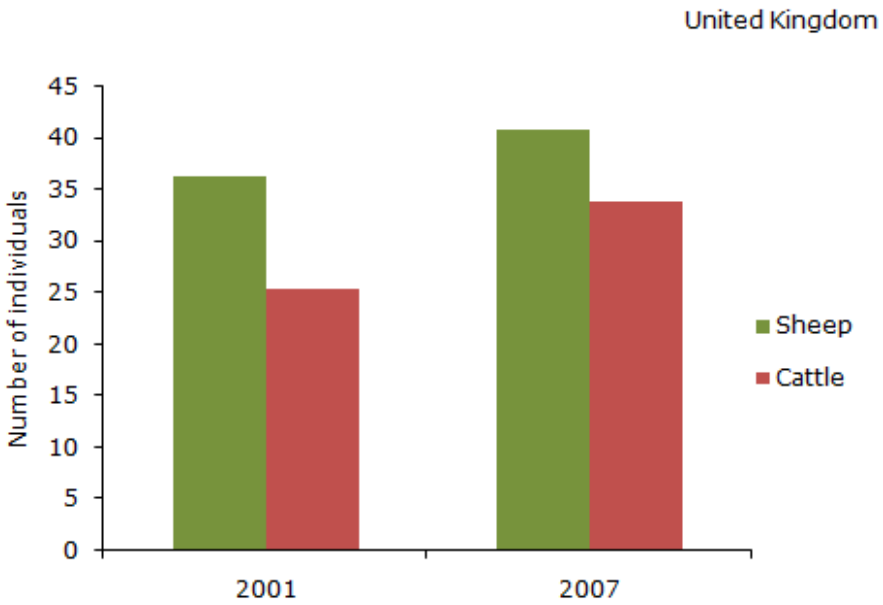
a. Animal genetic resources – effective population size

i. Native sheep breeds

ii. Native cattle breeds

Type: State / Benefit Indicator

Figure C9ai. 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 and 18 cattle breeds. The 2007 values are based on assessments for 26 sheep 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: Grassroots Systems Ltd, Roslin Institute, Scottish Agricultural College.

Assessment of change in effective population size			
	Long term*	Short term	Latest year
Native sheep breeds		2001–2007	Not Assessed
Native cattle breeds		2001–2007	Not Assessed

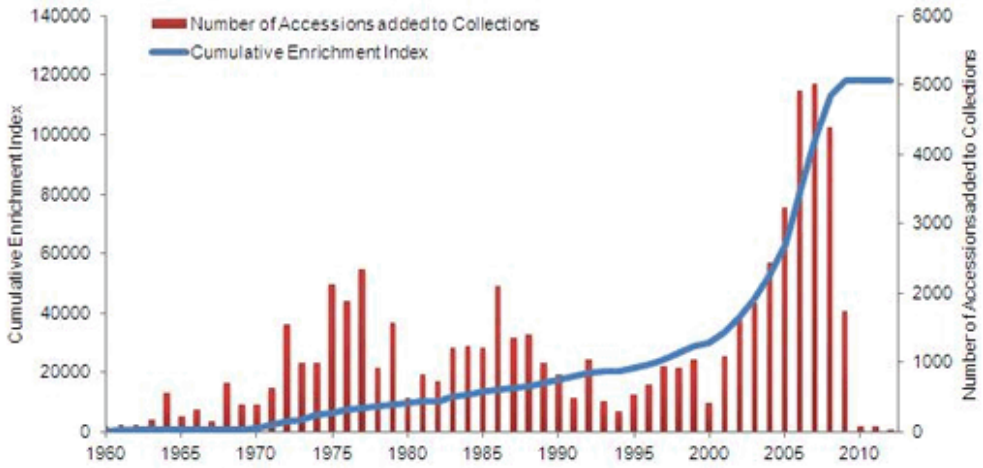
*A long term assessment is not made as the data do not go back more than 10 years.

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

3. An update for the UK data holdings in EURISCO is planned to be completed by the end of 2014, so it is hoped this indicator can be updated in 2015.

Source: EURISCO Catalogue (http://eurisco.ipk-gatersleben.de/apex/f?p=103:1:9635411549197, 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; Germplasm Resources Unit, John Innes Centre, Norwich Research Park; Millennium Seed Bank Project; Nottingham Arabidopsis Stock Centre; 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)

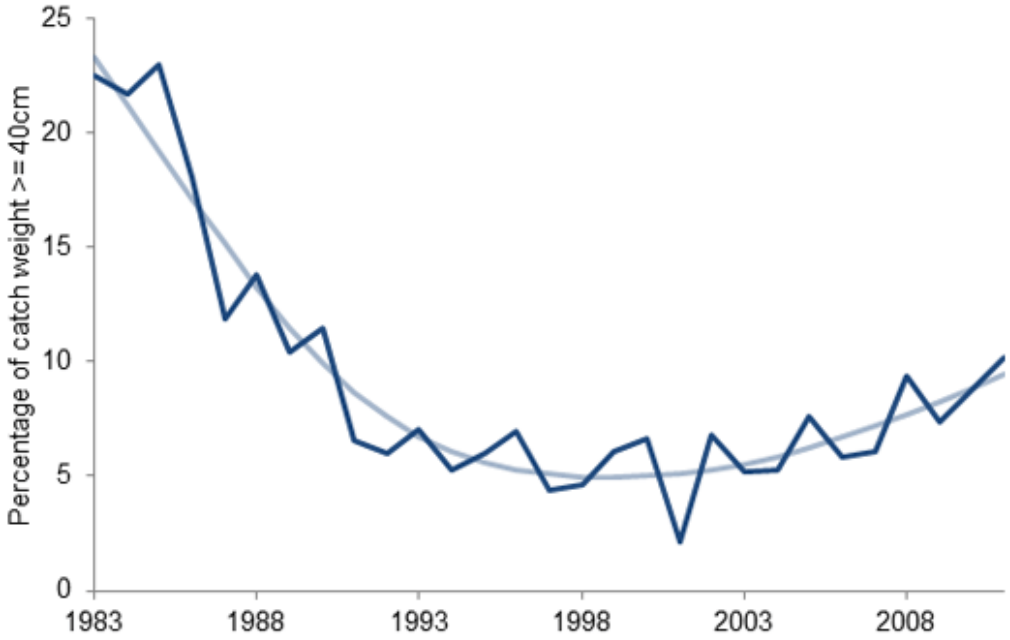
- Genetic diversity is an important component of biological diversity. The genetic diversity of UK plant resources includes domesticated plants and their wild relatives, as well as socio-economically and culturally valuable plant species. These encompass plants grown in a farming or horticultural setting, 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 a 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

a. Fish size classes in the North Sea

Type: State Indicator

Figure D1ai. Proportion of large fish (equal to or larger than 40cm), by weight, in the North-western North Sea, 1983 to 2011.



Notes: Graph shows unsmoothed trend (darker line) and smoothed trend (lighter line).

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

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 (CEFAS) 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 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 percentage points between 2010 and 2011, based on the unsmoothed index. Fluctuations in numbers between years are typical features of the size of North Sea fish populations.

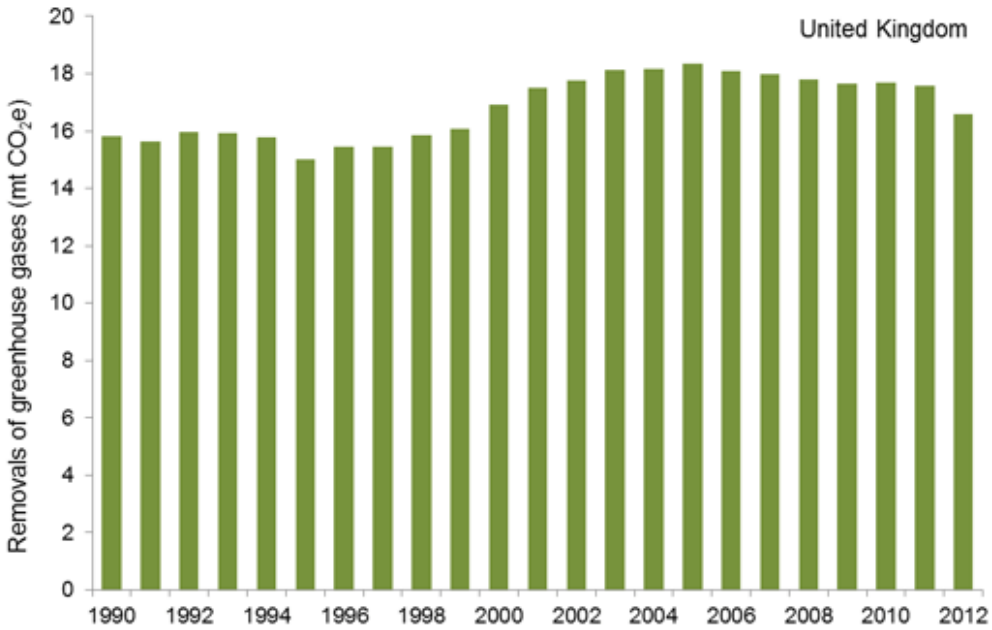
- The measure for the North-western North Sea is used as the main indicator because it is based on the largest dataset and provides the most reliable indicator of change. In addition, the North Sea supports important fisheries and several are still recovering from over-exploitation. Although the figures are less up-to-date, there has been a similar modest increase in recent years in some other seas around the UK since 2000.

b Removal of greenhouse gases by UK forests

Type: Benefits Indicator

This indicator is under development. At present it is only possible to show net annual removal of greenhouse gases by forests in the UK. In future updates of the UK Biodiversity Indicators we anticipate that it will be possible to provide greenhouse gas removals by type of woodland (conifer or broadleaf). This is interesting from a biodiversity perspective as it allows clearer presentation of the contribution made to greenhouse gas removals by native woodland habitat (i.e. broadleaf). The methodology used to produce the estimates of greenhouse gas removals, published in the Land Use, Land Use Change and Forestry greenhouse gas inventory (LULUCF), is currently under review and is likely to change significantly in 2015. The information presented below gives an indication of the data that are currently available.

Figure D1bi. Annual net removal of greenhouse gases by UK forests, 1990 to 2012.



Notes:

1. Annual net removals of greenhouse gases (carbon dioxide (CO_2), methane (NH_4) and nitrous oxide (N_2O)) from the atmosphere by forests in the UK.
2. The indicator presented here is provisional, prior to significant changes to input data and model development that will be implemented in 2015.

Source: Land Use, Land Use Change and Forestry greenhouse gas inventory.

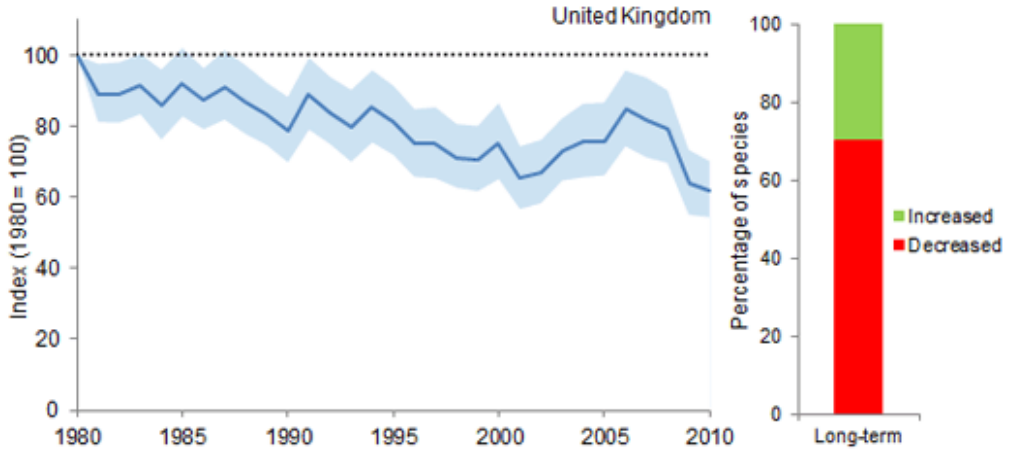
- This indicator is in development and is not assessed. It shows the annual net removal of greenhouse gases from the atmosphere by UK forests between 1990 and 2012.
- In 2012, UK forests are estimated to have removed the equivalent of 16.6 million tonnes (mt) of CO_2 from the atmosphere.

- Broadleaf woodland – predominantly priority native woodland habitat – contributed 33 per cent of the removals, a figure that has increased from 22 per cent in 1990.

c. Status of pollinating insects

Type: State indicator

Figure D1ci. Change in the relative occupancy of bees in the UK, 1980 to 2010.



Notes:

1. Based on 216 species of bee.
2. Graph shows unsmoothed trend (solid line) with its 95 per cent confidence interval (shaded).
3. The bar chart to the right shows the percent of species that increased or decreased between 1980 and 2010.

Source: Bees, Wasps & Ants Recording Society, Biological Records Centre (supported by the Centre for Ecology & Hydrology and the Joint Nature Conservation Committee).

Assessment of change in relative occupancy of bees in the UK			
	Long term	Short term	Latest year
Relative occupancy of bees in the UK	Not Assessed	Not Assessed	Not Assessed

Note: The indicator has not been assessed as it is an experimental, interim statistic. Further development of the analytical technique and refinements to the species list should allow the indicator to be assessed in future years.

- Between 1980 and 2010, the change in the relative occupancy of bees in the UK fell to 62 per cent of its 1980 value.
- There was a steady decline in relative pollinator occupancy from 1980 to a low of 65 in 2001. This was followed by a recovery and the index reached a value of 85 in 2006. This was then followed by a rapid decline to a value of 62 in 2010.
- 70 per cent of bee species declined between 1980 and 2010.

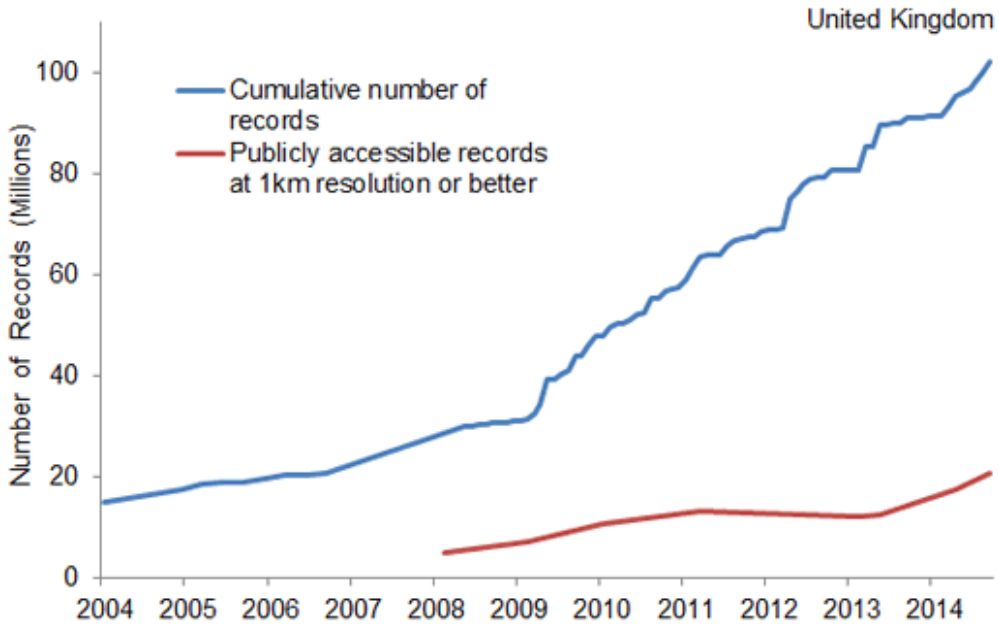
E1. Biodiversity data for decision making

a. Cumulative number of records

b. Number of publicly accessible records at 1km^2 resolution or better

Type: State Indicator

Figure E1i. Records added to the National Biodiversity Network Gateway, 2004 to 2014.



Notes: Data available to 1st September 2014.

Source: National Biodiversity Network.

Assessment of change in data for decision making			
	Long term	**Short term**	**Latest year**
Cumulative number of records	2004–2014	2009–2014	Increased (2014)
Number of publicly accessible records at 1km^2 resolution or better		2009–2014	Increased (2014)

- The number of records within the National Biodiversity Network Gateway has increased from 15 million at the start of 2004 to 31 million at the start of 2009, and to over 101 million at the end of August 2014. Since the start of 2009 there has been an increase of over 70 million records.
- The number of publicly accessible records which are at 1km^2 resolution or better increased from 7.2 million at the start of February 2009 to 20.7 million at the start of September 2014.

E2. Expenditure on UK and international biodiversity

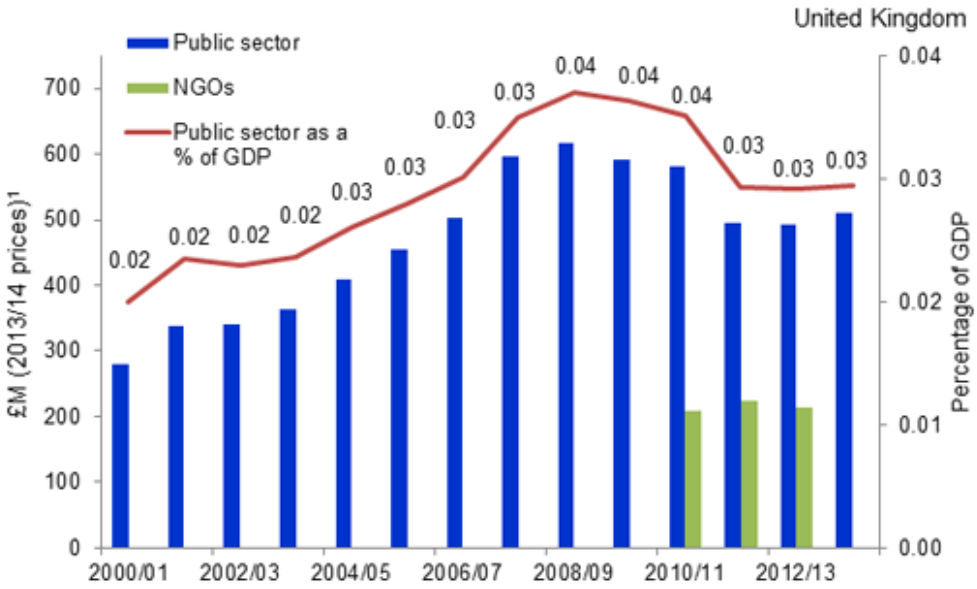
a. Public sector expenditure on UK biodiversity

b. Non-governmental organisation expenditure on UK biodiversity

c. UK expenditure on international biodiversity

Type: Response Indicator

Figure E2i. Expenditure on biodiversity in the UK, 2000-01 to 2013-14.

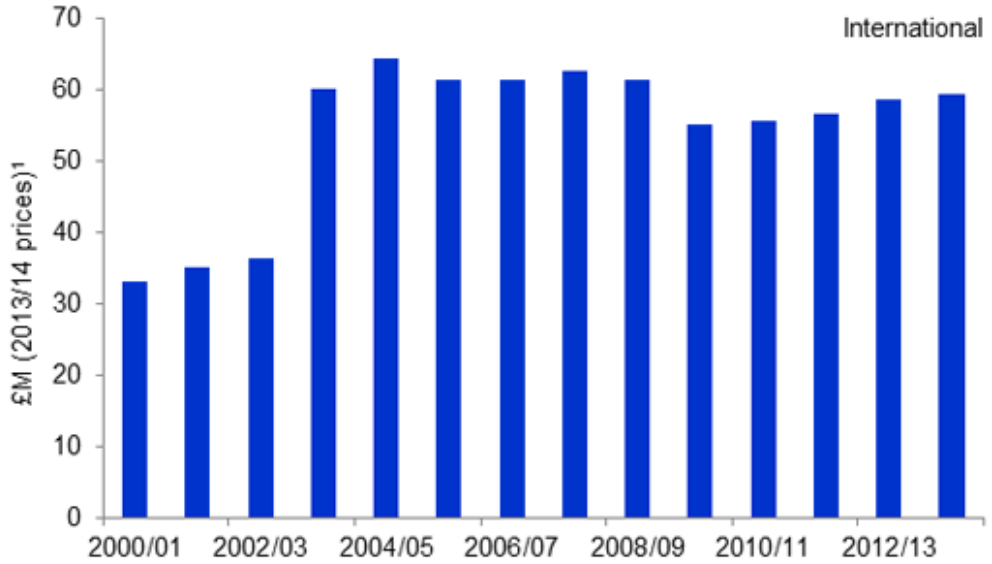


Notes:

1. Deflated using UK Gross Domestic Product Deflator.
2. Non-governmental spend is net of government funding.
3. Small revisions to past data series as a result of improved estimation methodology can mean the indicator does not show exactly the same pattern between years.

Source: Defra, Her Majesty's Treasury.

Figure E2ii. UK public sector expenditure on international biodiversity, 2000-01 to 2013-14.



Notes: 1. Deflated using UK Gross Domestic Product Deflator.

Source: Defra.

Assessment of change in public expenditure on biodiversity			
	Long term	**Short term**	**Latest year**
Public sector spending on biodiversity in the UK	2000/01–2013/14	2008/09–2013/14	Increased (2013-14)
Non-governmental organisation spending (net of Government funding) on biodiversity in the UK			Decreased (2012-13)
UK public sector expenditure on international biodiversity	2000/01–2013/14	2008/09–2013/14	No change (2013-14)

- 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, along with other international biodiversity policy commitments.
- In 2013-14, £511 million of UK public sector funding was spent on UK biodiversity; this value has increased since 2012-13. Between 2000-01 and 2013-14, public sector spending on UK biodiversity increased by 82 per cent in real terms, although it declined between 2008-09 and 2011-12.
- Public sector funding on UK biodiversity relative to GDP has remained stable in 2013-14 compared to 2012-13. In 2013-14 approximately £3 was spent on biodiversity for every £10,000 of GDP.
- Spending on biodiversity in the UK by non-governmental organisations (NGOs) with a biodiversity or nature focus was £213 million in 2012/13 (net of Government funding). This value is likely to be an underestimate as the indicator does not include all NGOs with a

biodiversity or nature focus. Based on the current indicator, spending has increased slightly since the first year of data collection (2010-11), but declined in the latest year between 2011-12 and 2012-13.

- In 2013-14, UK public sector funding for international biodiversity totalled £60 million. International spending by the UK public sector has increased by 81 per cent since 2000-01 in real terms. There was a reduction of about 10 per cent in 2009-10 compared with 2008-9, since when spending has increased gradually.

Enquiries about the biodiversity indicators or this publication

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

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Information on other environmental statistics is also available on Defra's webpages at https://www.gov.uk/government/organisations/department-for-environment-food-rural-affairs/about/statistics.

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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: http://jncc.defra.gov.uk/ukbi.

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[6]. 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 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.

[6] http://www.statisticsauthority.gov.uk/assessment/code-of-practice/