UK Biodiversity Indicators 2018

This document, with additional supporting data and text, is available to be downloaded on the Joint Nature Conservation Committee website: www.jncc.defra.gov.uk/ukbi

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Introduction

UK Biodiversity Indicators 2018

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.

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 – in total nearly 100 organisations are involved. 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.

Links to the full detail of each of the previous editions are provided on the Joint Nature Conservation Committee website (stored on The National Archives website).

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

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   ✗ Deteriorating

≈ Little or no overall change   ⋯ Insufficient or no comparable data

Where possible statistical tests are used to decide if a positive or negative change has occurred. 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 applied when there is sufficient confidence that the change has occurred and is 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 3%, 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 3% 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.[1]

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 1% threshold, the direction of change is given simply as an acknowledgement of very recent trends and as a possible early indication of emerging trends.

[1] **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 and C3b have a six year short-term assessment**.

Overview of assessment of change for all indicators

The table below summaries traffic light assessments for 24 indicators and their component measures. For each indicator it's number, title, and measures (where applicable) are shown. Indicators are numbered according to the Strategic Goal with which they most closely link.

Indicator / measure(s)		Long-term change[2]	Short-term change[3]
A1. Awareness, understanding and support for conservation		⊙	⊙
A2. Taking action for nature: volunteer time spent in conservation		✓ 2000–2016	≈ 2011–2016
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	⊙	⊙

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Indicator / measure(s)			Long-term change[2]	Short-term change[3]
B1. Agricultural and forest area under environmental management schemes	B1a. Area of land in agri-environment schemes		✅ 1992–2017	❌ 2012–2017
	B1b. Area of forestry land certified as sustainably managed		✅ 2001–2018	🟡(≈) 2013-2018
B2. Sustainable fisheries	B2a. Proportion of fish stocks harvested sustainably		✅ 1990–2015	✅ 2010–2015
	B2b. Biomass of stocks at full reproductive capacity		✅ 1990–2016	🟡(≈) 2011-2016
B3. Climate change adaptation			Under development	
B4. Pressure from climate change (Spring Index)			Not assessed	Not assessed
B5. Pressure from pollution	B5a. Air pollution	B5a(i). Area affected by acidity	✅ 1996–2015	✅ 2010–2015
		B5a(ii). Area affected by nitrogen	✅ 1996–2015	🟡(≈) 2010–2015
	B5b. Marine pollution		✅ 1990–2016	✅ 2011–2016
B6. Pressure from invasive species	B6a. Freshwater invasive species		❌ 1960–2017	Not assessed
	B6b. Marine (coastal) invasive species		❌ 1960–2017	Not assessed
	B6c. Terrestrial invasive species		❌ 1960–2017	Not assessed
B7. Surface water status			⚪(...)	❌ 2012–2017
C1. Protected areas	C1a. Total extent of protected areas: on-land		✅ 1950–2018	🟡(≈) 2013–2018
	C1b. Total extent of protected areas: at-sea		✅ 1950–2018	✅ 2013–2018
	C1c. Condition of Areas/Sites of Special Scientific Interest		✅ 2005–2018	🟡(≈) 2013–2018
C2. Habitat connectivity			Experimental Statistic – under review	
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

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Indicator / measure(s)			Long-term change[2]	Short-term change[3]
C4. Status of UK priority species	C4a. Relative abundance		✗ 1970–2015	✗ 2010–2015
	C4b. Distribution		≈ 1970–2016	≈ 2011–2016
C5. Birds of the wider countryside and at sea	C5a. Farmland birds		✗ 1970–2015	✗ 2010–2015
	C5b. Woodland birds		✗ 1970–2015	≈ 2010–2015
	C5c. Wetland birds		≈ 1975–2015	≈ 2010–2015
	C5d. Seabirds		Not Assessed	Not Assessed
	C5e. Wintering waterbirds		✓ 1975/76–2014/15	✗ 2009/10–2014/15
C6. Insects of the wider countryside	C6a. Semi-natural habitat specialists		✗ 1976–2017	≈ 2012–2017
	C6b. Species of the wider countryside		✗ 1976–2017	≈ 2012–2017
C7. Plants of the wider countryside			Under development	
C8. Mammals of the wider countryside (bats)			✓ 1999–2016	✓ 2011–2016
C9. Genetic resources for food and agriculture	C9a. Animal genetic resources – effective population size of Native Breeds at Risk	C9a(i). Goat breeds	✓ 2004–2017	✓ 2012–2017
		C9a(ii). Pig breeds	✓ 2000–2017	✗ 2012–2017
		C9a(iii). Horse breeds	✗ 2000–2017	✗ 2012–2017
		C9a(iv). Sheep breeds	✓ 2000–2017	✓ 2012–2017
		C9a(v). Cattle breeds	✓ 2000–2017	✓ 2012–2017
	C9b. Plant genetic resources – Enrichment Index		✓ 1960–2018	✓ 2013–2018
D1. Biodiversity and ecosystem services	D1a. Fish size classes in the North Sea		≈ 1983–2016	✓ 2011–2016
	D1b. Removal of greenhouse gases by UK forests		✓ 1990–2016	✓ 2011–2016
	D1c. Status of pollinating insects		✗ 1980–2016	≈ 2011–2016

Indicator / measure(s)		Long-term change[2]	Short-term change[3]
E1. Biodiversity data for decision making	E1a. Cumulative number of records	✓ 2004–2018	✓ 2013–2018
	E1b. Number of publicly accessible records at 1km^2 resolution or better	✓ 2008–2018	✓ 2013–2018
E2. Expenditure on UK and international biodiversity	E2a. Public sector expenditure on UK biodiversity	✓ 2000/01–2016/17	✗ 2011/12–2016/17
	E2b. Non-governmental organisation expenditure on UK biodiversity	⊙	✓ 2011/12–2016/17
	E2c. UK expenditure on international biodiversity	✓ 2000/01–2016/17	✓ 2011/12–2016/17

[2] 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.

[3] 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 and C3b 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. The targets are known as 'Aichi Targets', after the province in Japan where they were agreed. 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. 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.

Assessment of change: all measures
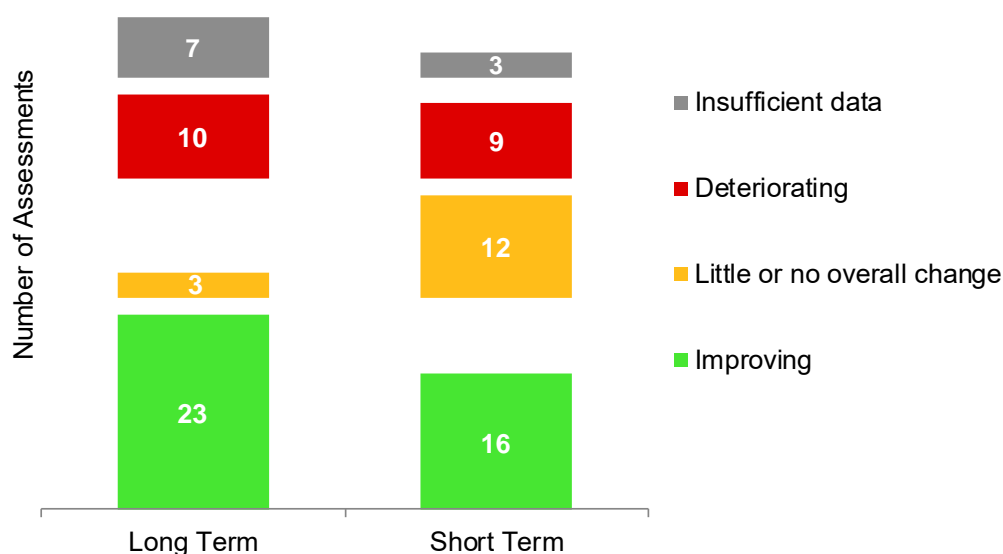
The UK biodiversity indicators set comprises 24 indicators and 50 measures. In 2018 41 measures within 18 indicators were updated. Seven measures are not assessed in the long-term, and ten in the short term, as the measures are either under development, or analytical methods for short-term assessment need to be refined. Twenty-three of the 43 measures assessed over the long term show an improvement, compared to 16 of the 40 measures that are assessed over the short term. Ten measures show a decline in the long term, and nine 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.

Key changes to the indicator set since the previous publication are:

i.   Corrections to the historic data for indicator A2 on conservation volunteering hours.

ii. Improvements to the biodiversity expenditure indicator (E2), in particular, clarification of what is included from different sources.

iii. A new experimental statistic on habitat connectivity based on population synchrony of butterflies monitored through the UK Butterfly Monitoring Scheme. The project team would welcome feedback on this.

iv. A method (see the full fiches) for assessing the confidence in the changes of the two indicators on priority species (C4a and C4b).

v.   The traffic light assessment for the seabirds measure (indicator C5d) was removed last year until a way of assessing variability is devised. This follows recommendations in a quality assurance science panel report, dated January 2016. Unfortunately this has not been possible in 2018, but it is hoped progress can be made in 2019.

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 long-term 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, air and marine 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 the area of forestry land certified as sustainably managed, in the biomass of fish stocks at full reproductive capacity, and in the area of

semi-natural habitats affected by eutrophication. There was a short-term decline in the area of land in higher-level / targeted agri-environment schemes, and in surface water status.
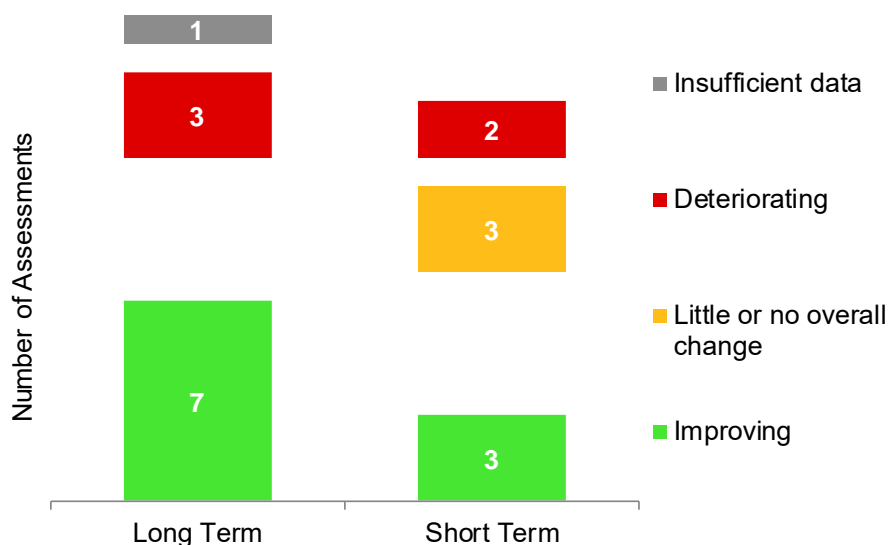
Goal C: Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity.

There were long-term declines for seven measures under Strategic Goal C (nine indicators and 23 measures prefixed 'C' in the summary table, covering status of biodiversity), reflecting the declines in many species populations seen in the 1970s and 1980s. There is some evidence that some of the previous declines have slowed, with some measures assessed as deteriorating in the long-term showing little or no overall change in the short-term (e.g. butterflies and woodland birds). In total, seven measures have shown improvement over the short term, including extent of protected areas at sea, 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.
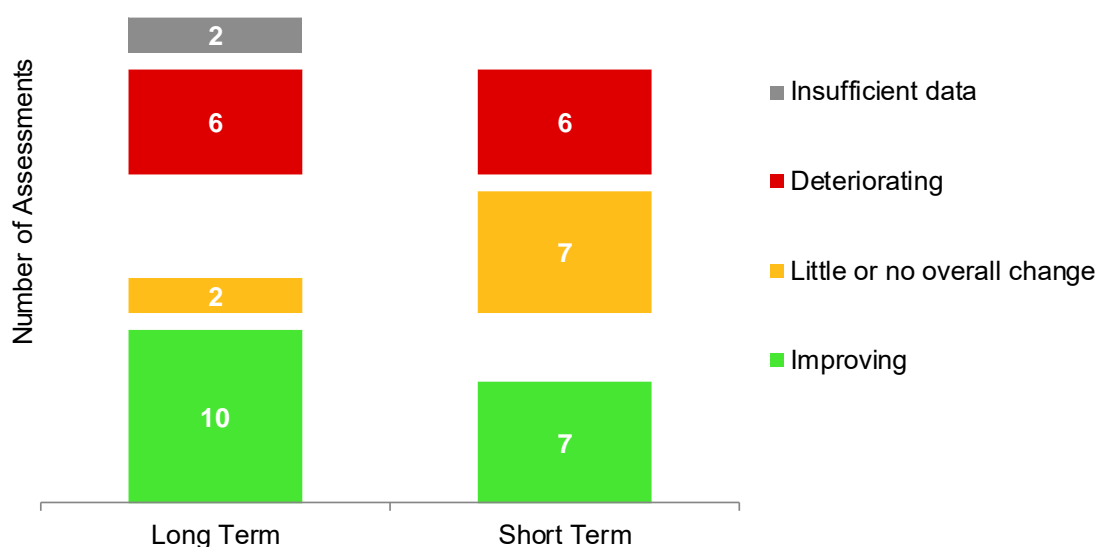
A1. Awareness, understanding and support for conservation

Type: Response indicator

No update since previous publication.

In 2014, 6% of people in the UK 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, including requiring some higher effort.

In 2014, 25% of people in the UK showed some engagement 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 some 'day-to-day' actions to support and protect biodiversity.

Indicator Description
This indicator addresses awareness of biodiversity and understanding of its value, concern about biodiversity loss, as well as support for performing actions that can help to conserve it. It uses a hierarchical system to group people in the UK according to the extent to which they are aware of the threat to biodiversity in the UK, their level of concern about the loss of biodiversity and the number and type of actions they take to support and protect it.

16% of people are aware of the threat to biodiversity, but are not concerned about it.

52% of survey respondents stated that they were not aware of the threat to biodiversity in the UK.

Figure A1i. **Public engagement with biodiversity loss: awareness, concern and action, 2014.**
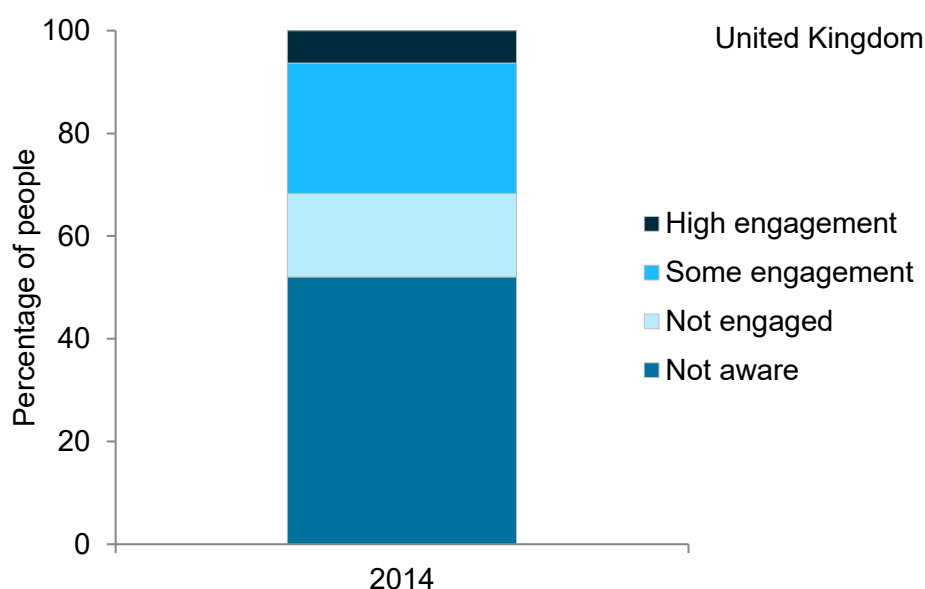
Notes:
1. Groups are defined as: 'not aware'; 'not engaged'; 'some engagement'; and 'high engagement', according to responses to survey questions concerning engagement with biodiversity loss, as described in the online fiche.
2. Data are weighted based on the relative population size of each country.

Source: Department of the Environment Northern Ireland, Natural England, Natural Resources Wales, 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

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

Type: Response Indicator

The amount of time people spend volunteering to assist in conservation in part reflects society's interest in and commitment to biodiversity.

Between 2000 and 2016, the amount of time contributed by volunteers in the UK has increased by 40%. It decreased by 6% in the 5 years to 2016, but in the most recent year available, the amount of time spent volunteering has increased by 4%.

The indicator is assessed as increasing over the long term and showing no change over the short term.

Indicator Description

This indicator presents an index of the number of hours worked by volunteers for 13 UK conservation charities and public bodies (including National Parks England which represents all National Parks in England – see the background section of the online fiche for a full list). Conservation volunteering includes any voluntary activity for an organisation or community undertaken to: further the understanding, protection or enjoyment of the natural environment, including wildlife recording and surveying; practical countryside management; providing education, training and guided walks; and administration or other office support.

Figure A2i.   Index of volunteer time spent in selected UK conservation organisations, 2000 to 2016.
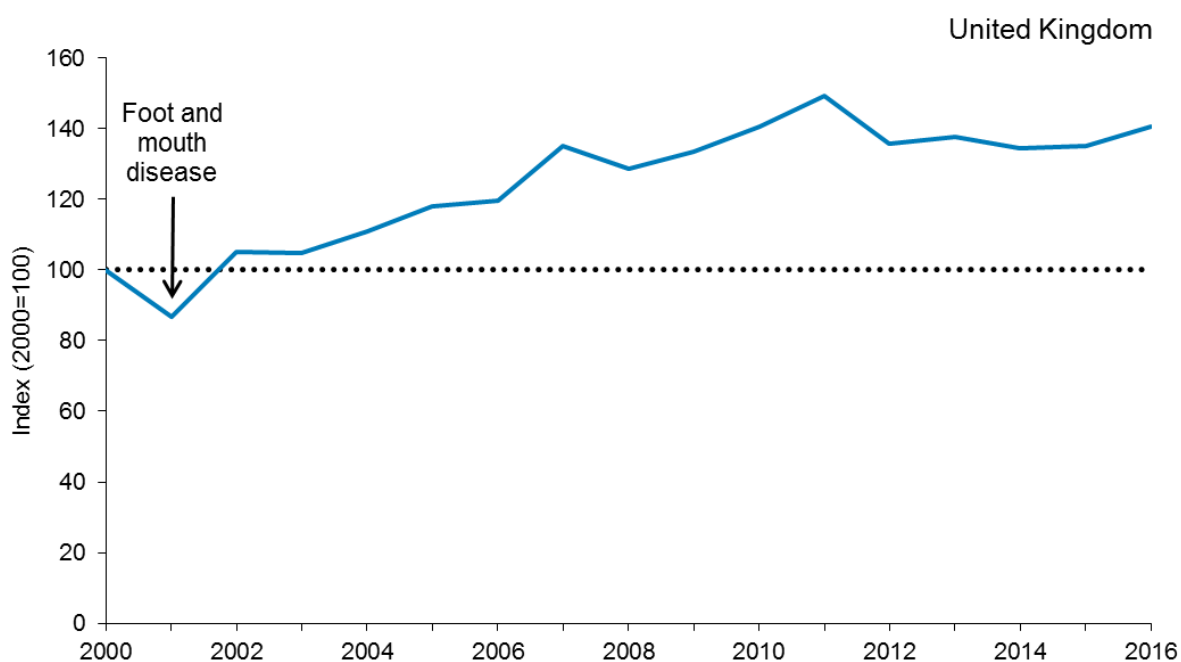
Notes:

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. Historical data were not available for all organisations in all years. To make best use of available data and to allow a combined index to be compiled, interpolation estimates have been used to fill gaps. Further details are given in the background section of the online fiche.

3. Data provided by The Conservation Volunteers, Loch Lomond & The Trossachs National Park Authority, Natural England, the Canal & River Trust (formerly British Waterways), National Parks England, RSPB and The Wildlife Trusts were for financial years rather than calendar years. Financial year data have been assigned to the first calendar year (e.g. 2016/17 data were allocated to 2016).

4. The data series has been revised since the 2017 publication due to some organisations, most notably The Wildlife Trusts, providing updated figures for previous years (see the background section of the online fiche for further details).

5. The methodology used to calculate the interpolated estimates was also revised in 2018. This chart is therefore not comparable to those presented in previous publications.

Source: Bat Conservation Trust, Botanical Society of Britain & Ireland (formerly Botanical Society of the British Isles), British Trust for Ornithology, Butterfly Conservation, Canal & River Trust (formerly British Waterways), The Conservation Volunteers, Loch Lomond & 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	✔️ 2000–2016	≈ 2011–2016	Increased (2016)

A3. Value of biodiversity integrated into decision making

Indicator under development – progress to date

No change from previous publication.

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.

Indicator Description

Indicator under development. The integration of biodiversity into mainstream social and economic processes should allow us to continue to enjoy the benefits of biodiversity that we currently achieve. However, this is a difficult concept to be able to measure, and it has not yet been possible to develop an indicator.

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

Indicator under development – progress to date

No change from previous publication.

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

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Indicator Description

Indicator under development. 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. A range of research work has been undertaken, but it has not at present been possible to develop an indicator.

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- 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.

A5. Integration of biodiversity considerations into business activity

a. Environmental Management Systems

b. Environmental consideration in supply chains

Type: Response indicator

No new data since the previous publication.

In 2013, 77% of large companies that responded to the EPE Survey had an Environmental Management System (EMS) in place, compared with 83% of responding companies in 2012 and 79% in 2011.

In 2013, 53 per cent of responding large companies had an EMS certified to ISO 14001.

Overall, in 2013 24% of respondents had an EMS in place which was not externally certified (i.e. it was developed and implemented to meet

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Indicator Description

The proportion of large businesses (250+ employees) in a range of sectors that are taking steps to minimise their environmental impact as measured using an Environmental Management System (EMS). The Environmental Protection Expenditure (EPE) survey (on which this indicator is based) has been discontinued. As a result it will not be possible to further update this indicator. Possibilities for a replacement are being considered.

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"in-house" needs). This compares to 31% of respondents having an "in-house" EMS in 2012.

Overall, 92% of large companies considered environmental issues within their supply chain in 2013, up from 78% in 2012. Within the 2013 figure, 58% formally considered environmental issues, 34% considered them informally; and 8% did not consider environmental issues at all.

Figure A5ai. **Percentage of large companies that use an Environmental Management System, 2011 to 2013.**
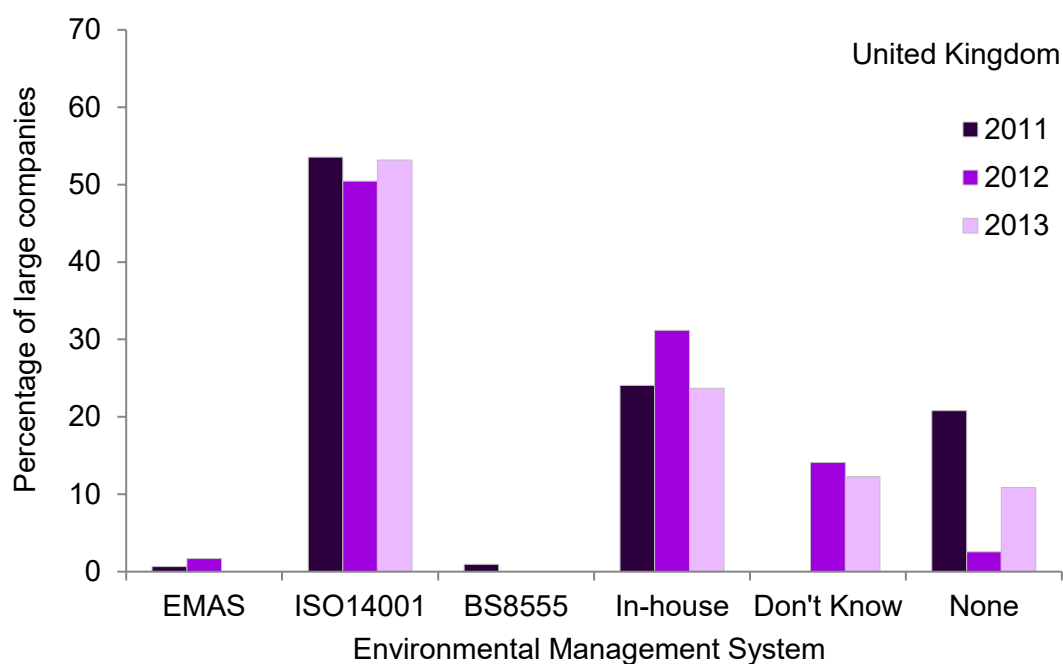
Notes:

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. Based on responses from 121 large companies in 2011, 127 large companies in 2012, and 134 large companies in 2013.
3. 'Large companies' are those that employ at least 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 that consider environmental issues in their supply chain, 2012 to 2013.**
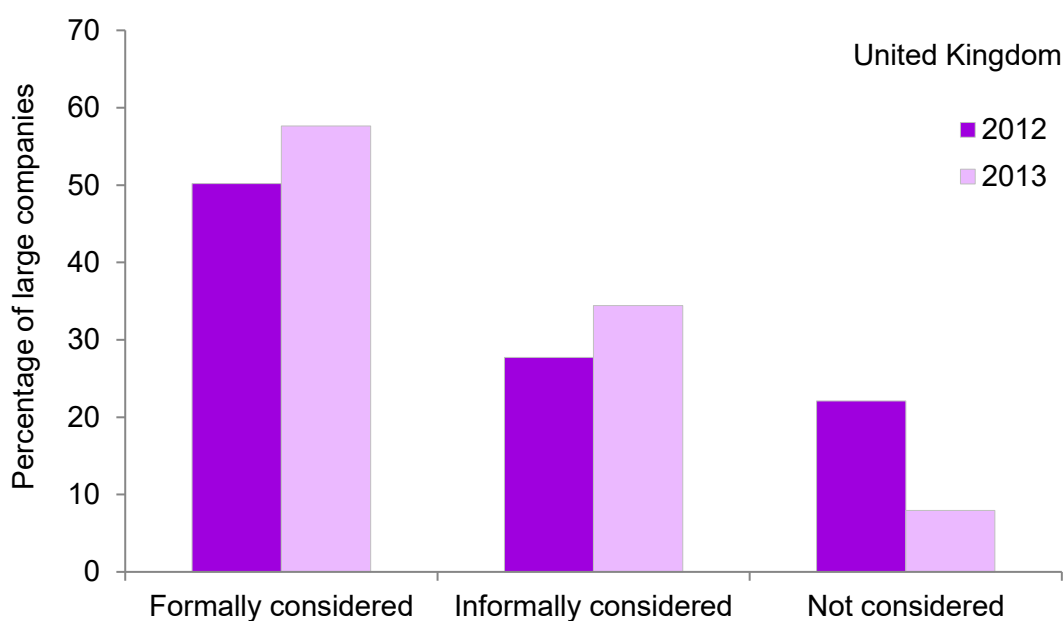
Notes:

1. Based on responses from 120 large companies in 2012, and 133 large companies in 2013.
2. 'Large companies' are those that employ at least 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 System (EMS)	⊙	⊙	Decreased (2013)
Percentage of companies where the environment is formally considered in the supply chain	⊙	⊙	Increased (2013)

B1. Agricultural and forest area under environmental management schemes

a.   Area of land in agri-environment schemes

Type: Response Indicator

In 2017, the total area of land in higher-level or targeted agri-environment agreements in the UK was 2.8 million hectares: 1.4 million hectares in England; 0.4 million hectares in Wales; just under 1.0 million hectares in Scotland; and 0.1 million hectares in Northern Ireland.

Fluctuations in areas of land under agri-environment agreements over time can occur as a result of the introduction of new schemes and the ending of previous scheme agreements. Existing agreements will continue until they expire.

Indicator Description

Agri-environment schemes require land managers, including farmers, to implement environmentally beneficial management and to demonstrate good environmental practice on their land. 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 promote public access and understanding of the countryside. The entry-level type schemes aim to encourage large numbers of land managers, to implement simple and effective environmental management on their land.

Figure B1ai.   Area of land covered by higher-level or targeted agri-environment schemes, 1992 to 2017.
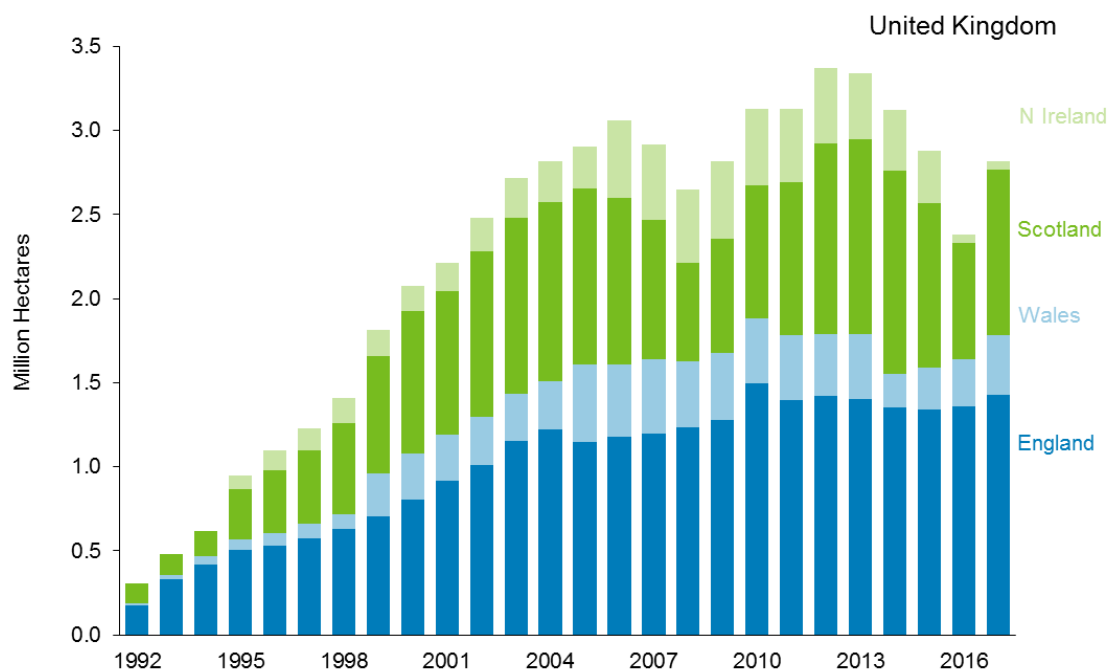
Notes:

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

    England: Environmentally Sensitive Areas (ESA), Countryside Stewardship, Higher Level Stewardship (which includes ELS linked to HLS) and from 2016 new Countryside Stewardship (Higher Tier and Mid Tier). England Mid Tier and Higher Tier schemes of the new Countryside Stewardship both contribute to B1ai.

    Scotland: ESA, Countryside Premium, and Rural Stewardship, Rural Priorities, and from 2016 Agri-Environment Climate Scheme.

    Wales: ESA, Tir Cymen, Tir Gofal, and Glastir Advanced and Decoupled Advanced (from 2016).

    Northern Ireland: ESA, Countryside Management and and Environmental Farming Scheme (from 2017).

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

Source: Department of Agriculture, Environment and Rural Affairs - Northern Ireland, 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	✓ 1992–2017	✗ 2012–2017	Increased (2017)

b. Area of forestry land certified as sustainably managed

Type: Response Indicator

In March 2018, there were 1.38 million hectares of certified woodland across the UK, representing 43% of the total woodland area. The proportion of woodland certified as sustainably managed has remained stable at either 43% or 44% since 2007.

Indicator Description

This indicator shows the percentage of the woodland area that is certified against agreed environmental standards. Woodland certification schemes promote good forest practice and are used to demonstrate that wood or wood products come from well-managed forests.

Figure B1bi. Percentage of woodland area certified as sustainably managed, 2001 to 2018.
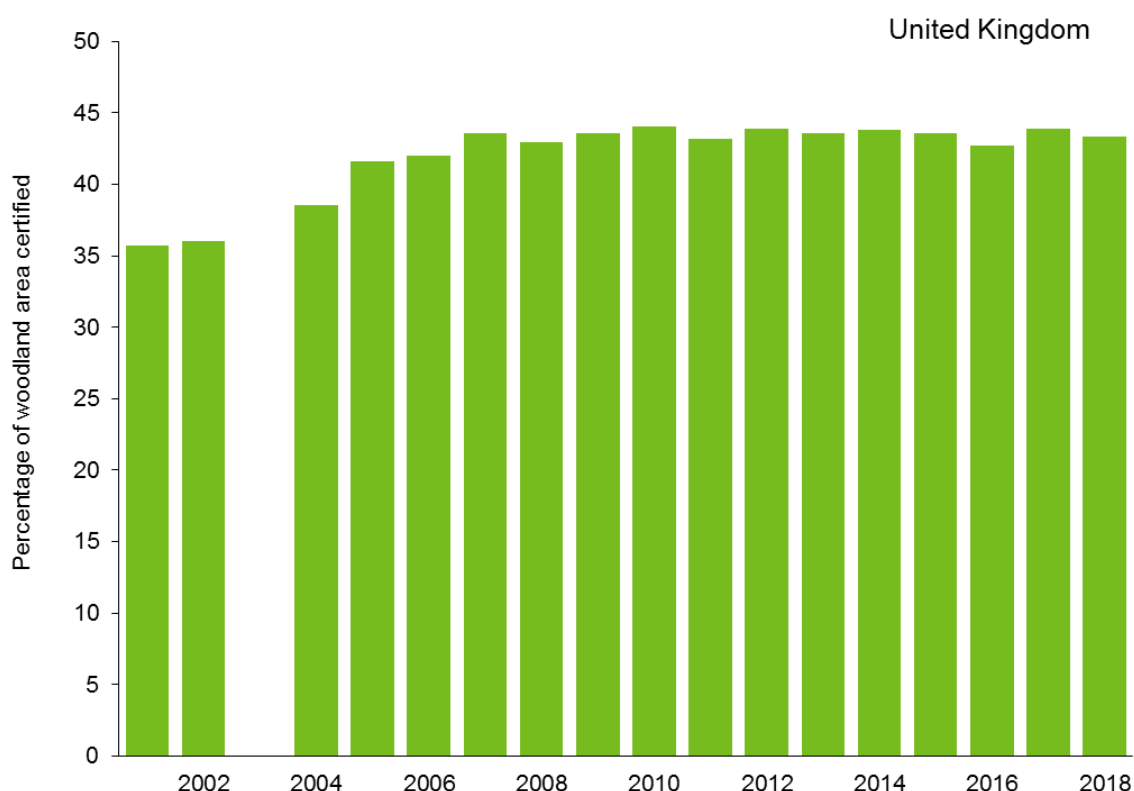
Notes: All figures relate to data at 31 March, apart from 2001 (31 December) and 2002 (30 September).

Source: Forestry Commission.

Certification of woodlands promotes responsible forest management to safeguard forests' natural heritage and protect threatened species. Since 2001, the percentage of woodland certified as sustainably managed in the UK has increased from 36% to 43% in 2018. The percentage of woodland certified as sustainably managed in the UK remains relatively stable with a slight decrease in the latest year.

The total area certified can change if new woodlands are certified, if existing certificates are not renewed, or if there is a time lag in renewal of an existing certificate.

Assessment of change in area of woodland certified as sustainably managed			
	Long term	**Short term**	**Latest year**
Percentage of woodland certified	✅ 2001–2018	😐 2013–2018	Decreased (2018)

Note: Assessment of the individual measures are based on a three-year average from the baseline, using the three earliest consecutive years available.

B2. Sustainable fisheries

a. Proportion of marine fish (quota) stocks of UK interest harvested sustainably

b. Proportion of marine fish (quota) stocks of UK interest with biomass at levels that maintain full reproductive capacity

Type: Pressure (a) and state (b) Indicator

Changes have been made to the indicator since the previous publication; using quota-fish assessments for UK good environmental status (GES) developed to meet the needs of the Marine Strategy Framework Directive (MSFD). Data have been updated to 2015 for fishing pressure and to 2016 for spawning stock biomass.

Indicator Description

Sustainable fisheries help to ensure marine ecosystems remain diverse and resilient, providing a long-term and viable fishing industry. The indicator comprises two measures assessed separately: a) the proportion of stocks fished at or below the level capable of producing Maximum Sustainable Yield (MSY); and b) the proportion of stocks with biomass above the level capable of producing MSY.

Figure B2a. Proportion of marine fish (quota) stocks of UK interest harvested sustainably, 1990 to 2015.
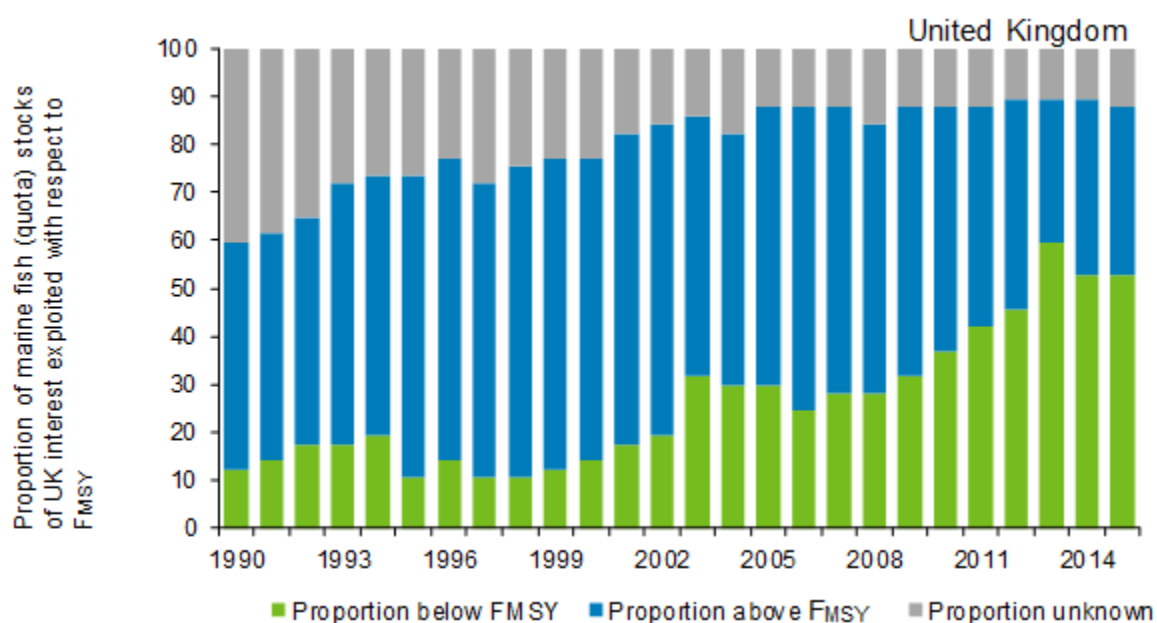
The percentage of fish stocks (including *Nephrops*) fished at or below levels capable of producing maximum sustainable yield (F_{MSY}) has increased from 12% in 1990 to 53% in 2015. To maintain

the reproductive capacity of stocks, each stock's spawning biomass (SSB) should be at or above the level capable of producing maximum sustainable yield (i.e. MSY $B_{trigger}$). The proportion of stocks subject to quota management and achieving this goal increased from 28% in 1990 to 56% in 2016. In the final year (2016) there was a slight (3%) decrease in the proportion of stocks with SSB > MSY $B_{trigger}$ due to data availability and consequently more stocks classified as "unknown". Overall a positive trend towards a greater proportion of stocks fished sustainably is evident in both long and short term. There is also a positive trend for fish within safe biological limits in the long term, and no change in the short term.

Figure B2b. Proportion of marine fish (quota) stocks of UK interest with biomass at levels that maintain full reproductive capacity, 1990 to 2016.
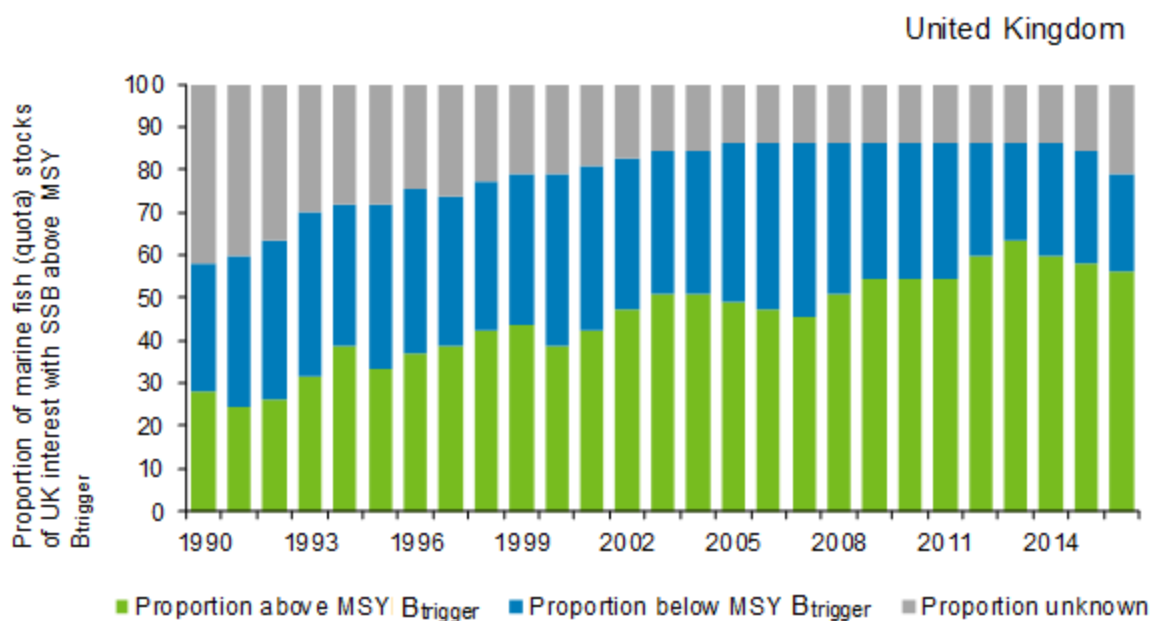
Notes: Based on 57 stocks for which data are available, derived from stock assessment reports. For spawning stock biomass (SSB) the final year will typically show an increase in 'unknown' status due to the cycle by which updates are made to stock assessments.

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

Overall assessment of change in stocks harvested sustainably and at full reproductive capacity			
	Long term	**Short term**	**Latest year**
Proportion of fish stocks harvested sustainably	✓ 1990–2015	✓ 2010–2015	No change (2015)
Biomass of stocks at full reproductive capacity	✓ 1990–2016	≈ 2011–2016	Decreased (2016)

B3. Climate change adaptation

Indicator under development – progress to date

No change from previous publication.

> **Indicator Description**
>
> This is a difficult concept to be able to measure, and it has not yet been possible to develop an indicator.

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.

Climate change indicators potentially need to cover a breadth of issues. Previous work highlighted possibilities to develop measures relating to water stress in protected areas, and gains and losses in coastal habitats, but a number of technical issues have meant that it is not possible to collate and present UK-wide data as previously expected.

B4. Pressure from climate change

Spring Index

Type: Context indicator

Since 1999, the annual mean observation dates have been around 6 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 equals or exceeds 7 degrees Celsius.

> **Indicator Description**
>
> This is a context indicator, and is not assessed; it is shown to highlight a biological response to climate change and a potential pressure on biological systems. It shows the impact of temperature change on the timing of biological events such as flowering or migration in the spring. 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*).

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 2017.**
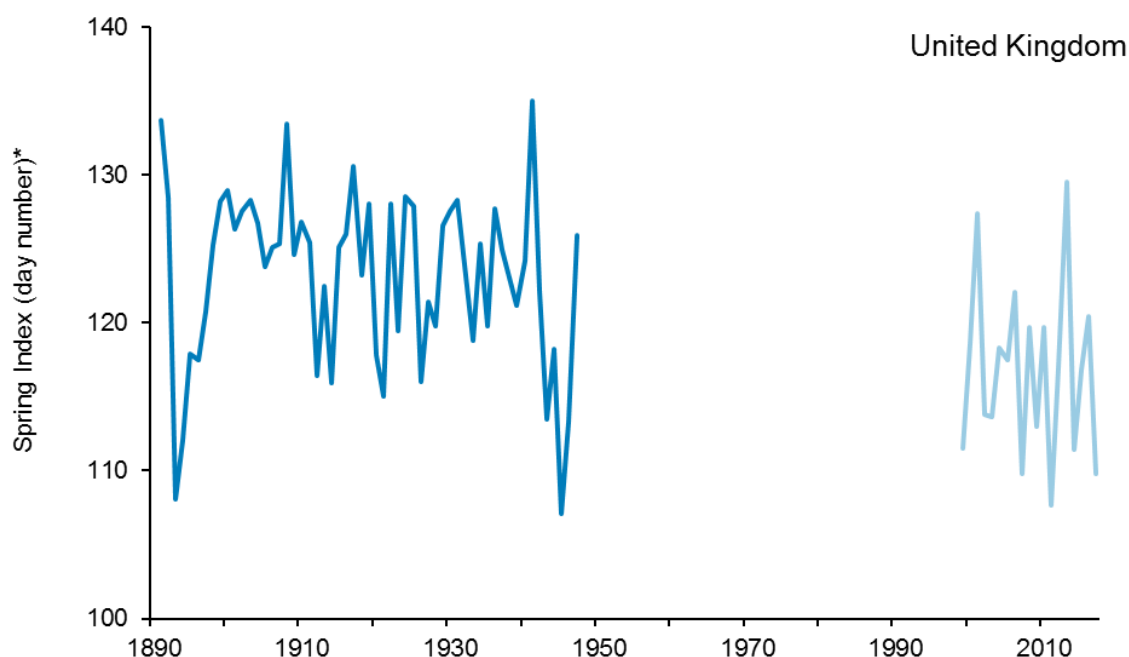
Notes: *Number of days after 31 December (e.g. day 121 = 1 May).

Source: 1891 to 1947 – Royal Meteorological Society; 1999 to 2017 – 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 Spring Index for the UK has high year-to-year variability, but since 1999 biological events in the spring have occurred around 6 days in advance of the average dates in the period 1891 to 1947 (Figure B4i). The figures published since 2015 are slightly different to those published previously as a result of data correction in the underpinning database.

The advancement of spring events is strongly linked to warmer temperatures in March and April. The mean observation dates in 2011 were the second earliest for which there are records. 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

The area of sensitive UK habitats that exceeds the critical load for acidification has continued to decline since 1996, but there has been less change in the area that exceeds the critical load for eutrophication. Acid deposition exceeded critical load in 42% sensitive habitats in 2015, and nitrogen deposition exceeded critical load in 62% of sensitive habitats in 2015.

Indicator Description

The air pollutants sulphur dioxide, nitrogen oxides and ammonia can contribute to acidification, and nitrogen oxides and ammonia can contribute to terrestrial eutrophication. These pollutants arise mainly from burning fossil fuels and 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). Critical loads are thresholds for pollutant load above which significant harmful effects may occur on sensitive habitats, so statistics on critical load exceedance indicate the risk of damage.

Figure B5ai. Area of sensitive UK habitats exceeding critical loads for acidification and eutrophication, 1996 to 2015.
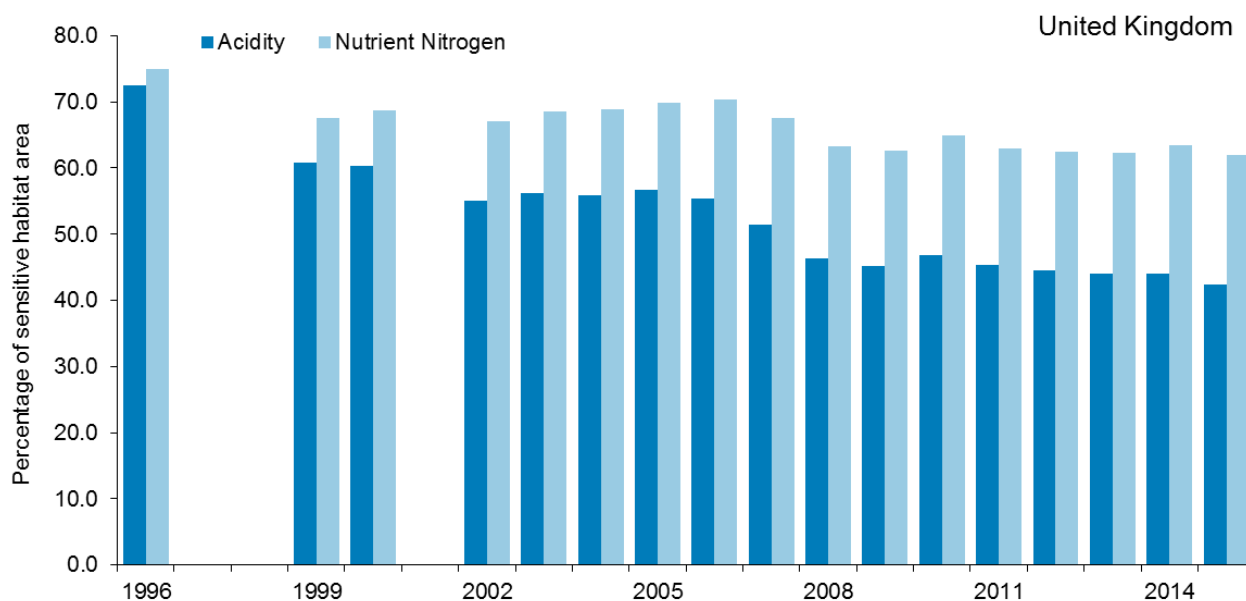
Notes:

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

2. Since 2002, nitric acid has been included in the estimates of nitrogen deposition, and since 2003 aerosol deposition loads of sulphate, nitrate and ammonium have also been included. This additional deposition led to some increases in critical load exceedance compared with earlier periods.

3. There was a revision to the calculation of deposition data for the period 2004 to 2013 in 2015, which means the exceedance results for this period are not directly comparable to those previously published.

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	✓ 1996–2015	✓ 2010–2015	Decreased (2015)
Area affected by nitrogen	✓ 1996–2015	≈ 2010–2015	Decreased (2015)

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. Approximately 78,000km^2 of UK terrestrial habitats is sensitive to acid deposition. About 73,000km^2 is sensitive to eutrophication; much of this is sensitive to both.

In 1996, acid deposition exceeded critical loads in 73% of the area of sensitive habitats. This declined to 42% in 2015. There has been a slight decrease in the area affected over the short term, since 2010, when the figure was 47%.

In 2015, nitrogen deposition exceeded critical loads in 62% of sensitive habitats. This was a decrease from a level of 75% in 1996. However there was little change in the short term.

Based on these figures the habitat areas at risk from acid and nitrogen deposition has declined over the long term (1996 to 2015), however, reducing deposition below the critical loads does not necessarily mean that ecosystems have recovered, as there can be a time-lags before the chemical environment and the flora and fauna recover.

b.   Marine pollution

Type: Pressure indicator

The combined inputs of all six hazardous materials into marine environments have shown a long term decrease of 80% since 1990. Inputs of five of these substances show decreases since 2011, however the input of copper has increased by 1% in the short term.

Indicator Description

The indicator shows the combined input of six of the most hazardous substances to the UK marine environment. The indicator is based on levels of five heavy metals (cadmium, mercury, copper, lead and zinc) and one organic compound (lindane). Pollution in the marine environment from these six substances should decrease to levels that are non-detrimental by 2020.

Figure B5bi.   Combined input of hazardous substances to the UK marine environment, as an index of estimated weight of substances per year, 1990 to 2016.
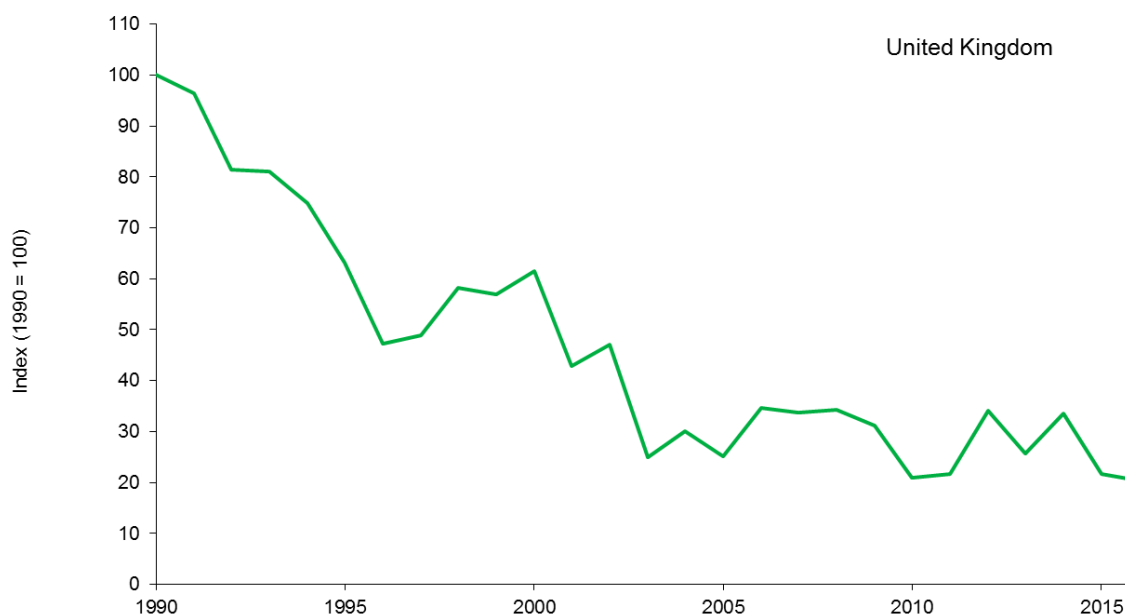
Source: Defra Marine Strategy and Evidence Division, using data provided by: Environment Agency, Northern Ireland Environment Agency, Scottish Environmental Protection Agency.

Levels of all six substances declined over the period 1990 to 2016: mercury and lindane each by 90%; cadmium by 87%; lead by 66%; zinc by 63% and copper by 57%.

In the short term, inputs of hazardous substances decreased by 20% from 2011 to 2016 (using a 3 year average for 2011). Inputs of five of these hazardous substances declined in the short term: lindane had the highest percentage decrease (-56%), followed by lead which decreased by 40%, and then zinc (-7%), and both cadmium and mercury decreased by -1%. The input of copper has increased by 1% since 2011.

Inputs into the marine environment are estimated from concentrations and flow rates in rivers entering the sea and those from estuarine and coastal point sources. Riverine inputs reflect both point and diffuse sources upstream of the sampling point and tend to be strongly influenced by flow rates. Flow rates are heavily affected by rainfall patterns so year to year fluctuations in pollutant loads are likely.

Assessment of change in input of hazardous substances			
	Long term	**Short term**	**Latest year**
Combined input of hazardous substances	✅ 1990–2016	✅ 2011–2016	Decreased (2016)

B6. Pressure from invasive species

a. Freshwater invasive species

b. Marine (coastal) invasive species

c. Terrestrial invasive species

Type: Pressure Indicator

There are 3,163 non-native species in Great Britain, 1,980 of which are classified as established (reproducing in the wild).

This indicator contains 190 non-native species that are considered to be exerting a negative impact on native biodiversity (46 freshwater species, 36 marine species and 108 terrestrial species). The majority (184) of these species are established; six[4] are long-term resident but not known to breed in the wild.

Over the period 1960 to 2017, invasive non-native species have become more prevalent in the countryside. Since 1960, the number of these species established in or along 10% or more of Great Britain's land area or coastline has increased in the freshwater, terrestrial and marine (coastal) environments, thereby increasing the likely pressure on native biodiversity.

Indicator Description

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 have arrived since 1500 are included within this indicator. 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; such species are termed invasive. Invasive non-native species have one or more of these negative impacts and a high capacity to spread to natural and semi-natural habitats. The indicator shows the change in number of invasive non-native species established across 10% or more of the land area of Great Britain, or along 10% or more of the extent of its coastline.

Comparing the latest period (2010 to 2017) with the previous one (2000 to 2009), the number of invasive non-native species established in or along 10% or more of Great Britain's land area or coastline has remained constant in terrestrial environments (at 56 species), and has increased in both freshwater (from 12 to 13 species) and marine environments (from 23 to 28 species).

[4]The six long-term resident species included the indicator are two species of terrapin (*Emys orbicularis, Trachemys scripta*) and four freshwater fish (*Ameiurus melas, Leuciscus idus, Salvelinus fontinalis, Oncorhynchus gorbuschas*).

Figure B6i. **Number of invasive non-native species established in or along 10% or more of Great Britain's land area or coastline, 1960 to 2017.**

Great Britain
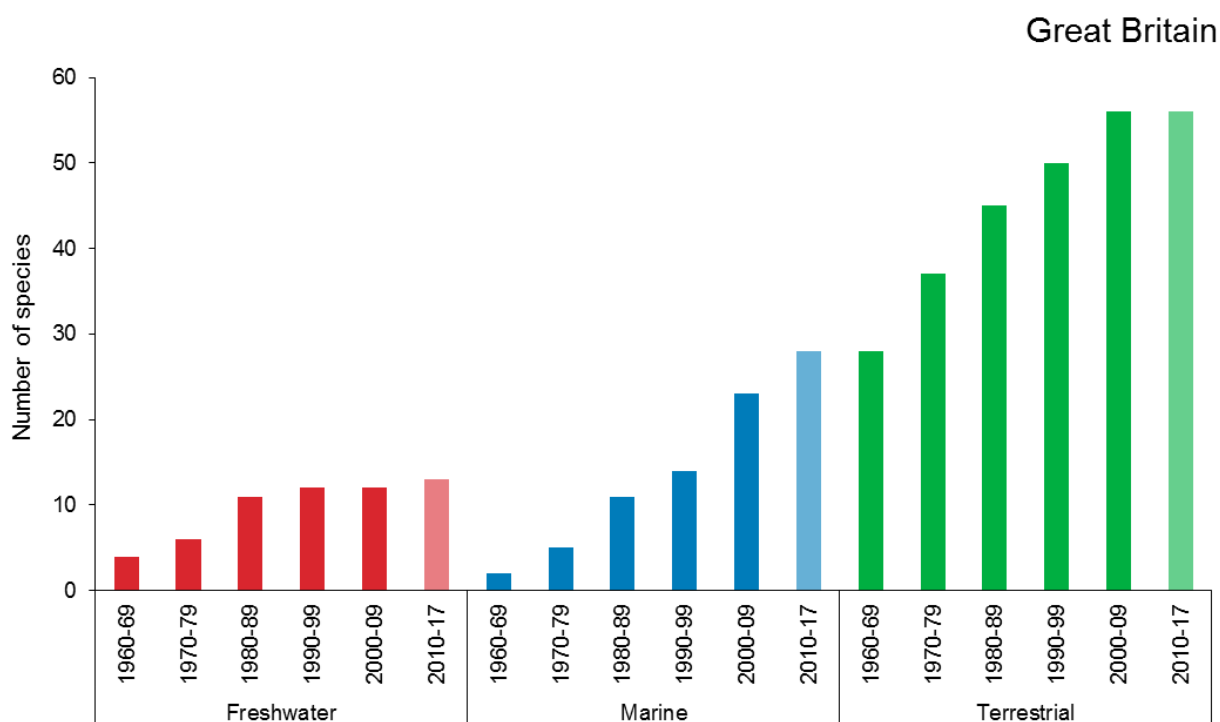
Notes: The last time period covers a shorter period than the other bars (2010–2017).

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

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	⊗ 1960–2017	Not assessed	Not assessed
Marine (coastal) invasive species	⊗ 1960–2017	Not assessed	Not assessed
Terrestrial invasive species	⊗ 1960–2017	Not assessed	Not assessed

B7. Surface water status

Type: State Indicator

There has been a small decrease in the overall number of surface water bodies in the UK awarded high or good status between 2012 and 2017. In 2017, 35% of surface water bodies were assessed under the Water Framework Directive (WFD) as being in high or good status compared with 36% in 2012; the indicator is assessed as declining in the short term.

Indicator Description

The Water Framework Directive (WFD) is an important mechanism for assessing and managing the water environment in the EU, through a 6 yearly cycle of planning and implementing measures to protect and improve the water environment. This indicator shows the percentage of surface water bodies in each status class and the change in the percentage of water bodies in the UK awarded a good or high surface water status class under the WFD. Around 10,000 water body assessments are included each year of the indicator; including rivers, canals, lakes, estuaries and coastal waters.

Figure B7i.   Status classification of UK surface water bodies under the Water Framework Directive, 2009 to 2017.
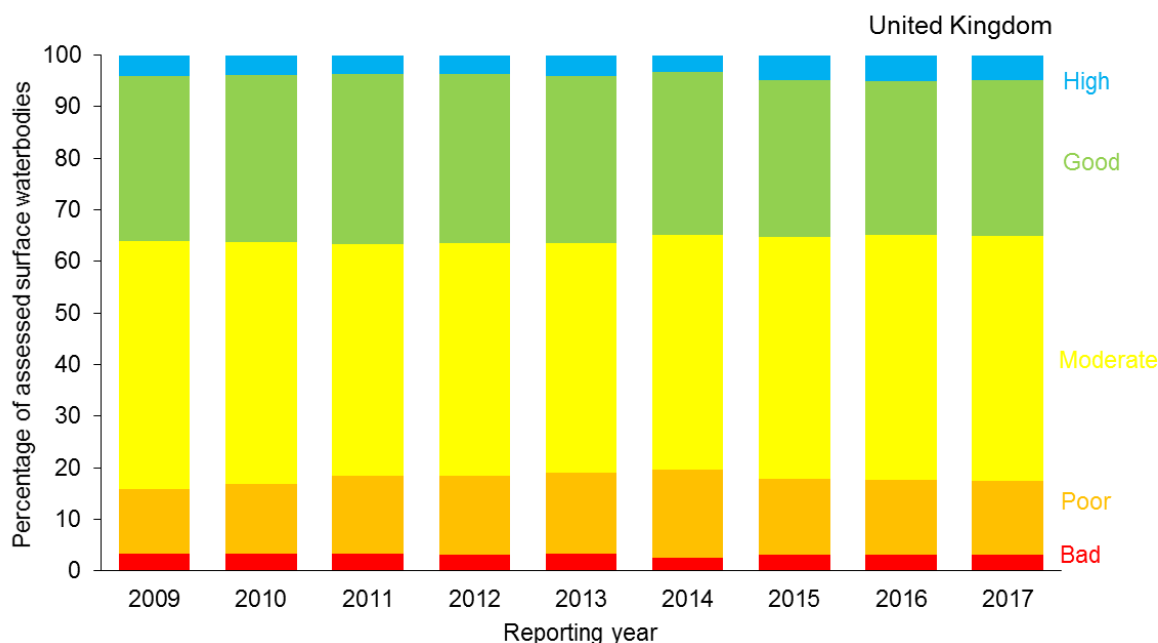
Notes:

1. Based on numbers of surface water bodies classified under the Water Framework Directive (WFD) 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. Water bodies that are heavily modified or artificial (HMAWBs) are included in this indicator alongside natural water bodies. HMAWBs are classified as 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.

4. The results published each year relate to data reported in that year under the WFD; data reported in a given year relates to data collected over the previous year. From 2016, England, Wales and Northern Ireland have moved to a triennial reporting system. Wales

and Northern Ireland reported in 2015 and will report next in late 2018; England reported in 2016 and will report next in 2019. Classifications are valid until they are next assessed; therefore, for years where a country does not report, their latest available data are carried forward.

5. The percentage of water bodies in each status class has been calculated based on the total number of water bodies assessed in each year.

6. The number of water body assessments included varies slightly from year to year: 10,835 water body assessments were included in 2009; 10,763 were included in 2010; 10,783 in 2011; 10,705 in 2012; 10,764 in 2013; 10,799 in 2014; 9,297 in 2015 and 2016; and 9,298 in 2017. These figures have been revised since the 2016 publication.

7. The reductions in the number of assessments made in 2015 were due to England, Wales and Northern Ireland adopting the monitoring and classification standards laid down in cycle 2 of the WFD. This means that data from 2014 onwards (when Scotland adopted the cycle 2 monitoring and classification standards) are not directly comparable to those in earlier years.

Source: Department of Agriculture, Environment and Rural Affairs 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'	⊙	❌ 2012–2017	No change (2017)

Note: Assessment of the measure is based on a 3-year average from the baseline.

The WFD specifies the quality elements that can be used to assess the surface water status of a water body. Quality elements can be biological (e.g. fish, invertebrates and plants), chemical (e.g. heavy metals, pesticides and nutrients) or indicators of the condition of the habitats and water flows and levels (e.g. presence of barriers to fish migration and modelled lake level data). Classifications indicate where the quality of the environment is good, where it may need improvement and what may need to be improved. They can also be used, over the years, to plan improvements, show trends and monitor progress.

The ecological status of UK surface water bodies is a measure that looks at both the biological and habitat condition status of a water body. Some small differences exist in the way the administrations and environment agencies implement the methods and tools for assessing water body status.

The introduction of new WFD monitoring data and classification standards (including a new baseline adopting all of the new standards, tools, designations and water body boundaries) in 2014 has led to a step change in the number of water bodies assessed as being in each status class in following years. It also led to a reduction in the total number of water bodies being assessed because under the new WFD guidance, water bodies below the 10km^2 catchment area no longer need to be included. The formal reporting of new standards in cycle 2 of the WFD has used the second cycle plans published in 2015. The introduction of reporting the cycle 2 standards has differed amongst the UK countries (see the online fiche for more detail).

C1. Protected areas

a. Total extent of protected areas: on-land

b. Total extent of protected area: at-sea

c. Condition of Areas / Sites of Special Scientific Interest

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

The total extent of land and sea protected in the UK through national and international protected areas, and through wider landscape designations, has increased by 12.6 million hectares, from 15.4 million hectares in December 2013 to 28.0 million hectares at the end of March 2018.

This 12.6 million hectare increase is almost entirely down to the designation of inshore and offshore marine sites under the European Union (EU) Habitats Directive, the designation of Marine Conservation Zones in English, Welsh, and Northern Irish waters, and designation of Nature Conservation Marine Protected Areas in Scottish waters. The extent of protected areas on land has increased by 12,900 hectares since 2013.

Indicator Description

The extent measures are a calculation of the net (non-overlapping) extent of protected areas using mean high water as the boundary between the at-sea and on-land measures.

The indicator also shows the condition of terrestrial and coastal features on Areas or Sites of Special Scientific Interest (A/SSSIs). A/SSSIs are designated for their 'features' – habitats or species which give them their scientific interest. Each country assesses the condition of features and reports either the area or the number of features in favourable or unfavourable-recovering ("recovering") condition. These assessments are converted to percentages in this indicator, to allow them to be combined, but the percentage does not equate exactly with the area that is favourable or recovering.

Figure C1i.   Extent of UK nationally and internationally important protected areas: (a) on-land; (b) at-sea, 1950 to 2018.
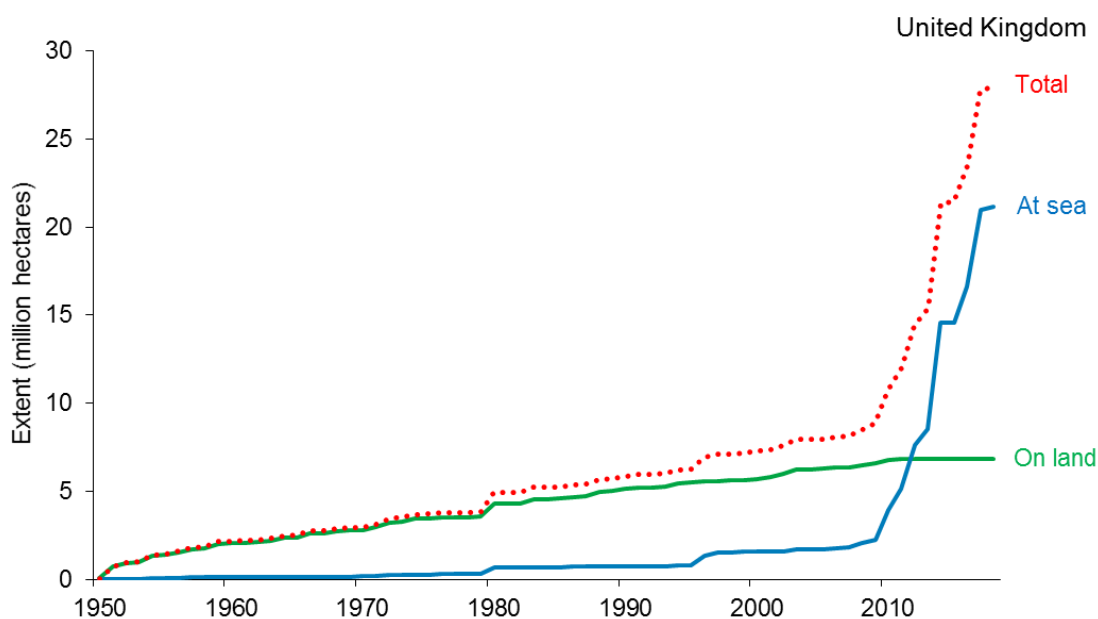
Notes:

1. The boundary 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 2018, the data cut-off is 31 March.

3. Extent is based on the following site designations: Areas of Special Scientific Interest, Sites of Special Scientific Interest, National Nature Reserves, Marine Conservation Zones, Nature Conservation Marine Protected Areas, Ramsar Sites, Special Areas of Conservation (including candidate Special Areas of Conservation and Sites of Community Importance), Special Protection Areas, Areas of Outstanding Natural Beauty, National Scenic Areas, 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 2018.**
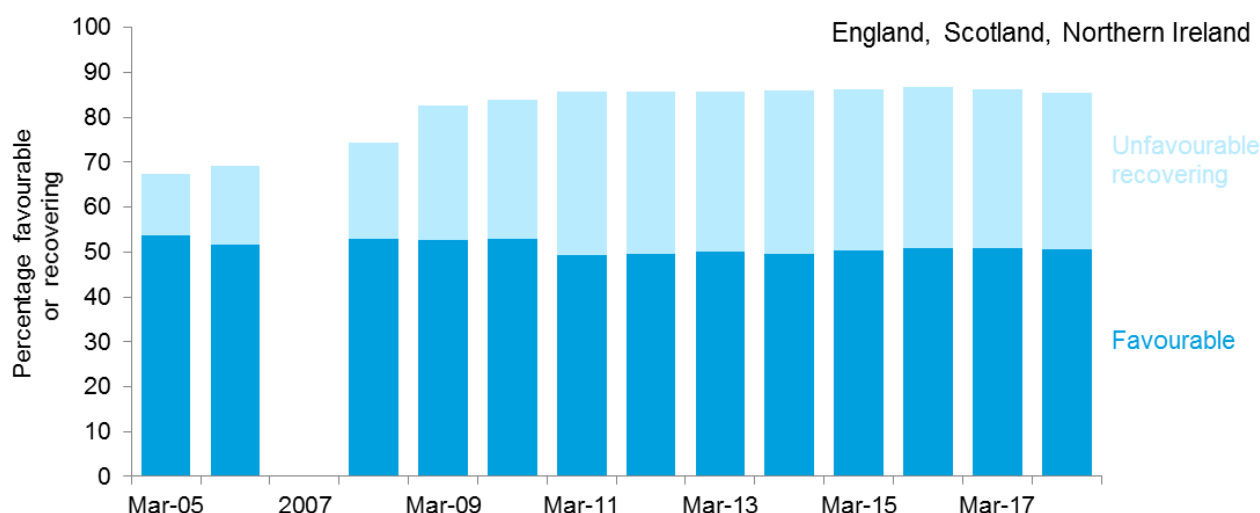
Notes:

1. England figures based on area. Scotland and Northern Ireland figures based on number of features.

2. Based on data to the end of the calendar month shown. 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. Figures exclude condition of A/SSSIs notified for geological features only.

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

The percentage of features, or area, of A/SSSIs in favourable or unfavourable-recovering condition increased from 67% in 2005, to 86% in 2013, and remained stable at 85% in 2018. The proportion of features or area of land in unfavourable-recovering condition (the light blue part of Figure C1ii) has increased from 14% in 2005 to 35% in 2018. These changes reflect improved management of sites, but may also be affected by a greater number of sites/features having been assessed over time.

Assessment of change in area and condition of UK protected areas			
	Long term	**Short term**	**Latest year**
Total extent of protected areas: on-land	✓ 1950–2018	≈ 2013–2018	No change (2018)
Total extent of protected areas: at-sea	✓ 1950–2018	✓ 2013–2018	No change 2018)
Condition of A/SSSIs	✓ 2005–2018	≈ 2013–2018	No change (2018)

C2. Habitat connectivity

Experimental statistic: The UK biodiversity indicators project team would welcome feedback on the novel methods used in the development of this indicator.

Type: State indicator

Between 1985 and 1995, the average functional connectivity of UK butterfly species was relatively stable, the index fell to a low of 48% in 2004, and then rose. The level of functional connectivity in 2012 is 10% greater than the level in the start year of 1985 (Figure C2i).

Assessing trends for individual species, between 1985 and 2000, 62% of species declined in connectivity with only 3% showing significant increases (Figure C2ii). In the latter half of the time series between 2000 and 2012, most species increased in connectivity (72%) with only 19% of species declining. The long-term trend from 1985 to 2012 masks mixed, individual species trends, with 33% of species increasing in functional connectivity, 19% decreasing, and 48% showing no significant change.

Indicator Description

Connectivity is a measure of the size and distribution of patches of habitat and the relative ease with which typical species can move through the landscape between the patches. Habitat loss and fragmentation can reduce the size of populations and hinder the movement of individuals between increasingly isolated populations, threatening their long-term viability.

The indicator illustrates changes in functional connectivity – the ability of species to move between resource patches – of 33 butterfly species in the UK. The indicator is based on a measure of population synchrony, which is the level of correlation in time-series of population growth rates from different monitoring sites. Quantifying functional connectivity will allow more targeted landscape conservation management to help reduce species extinction risk.

As this is an experimental statistic it has not been assessed. Views on whether Figure C2i or Figure C2ii should be the headline measure would be welcome, together with comments on the value of this new indicator (is this measuring something readers feel should be measured?) and the quality of the new metric (how well does it measure connectivity?).

Figure C2i. **Change in functional connectivity, 1985 to 2012, using a 10-year moving window.**

United Kingdom
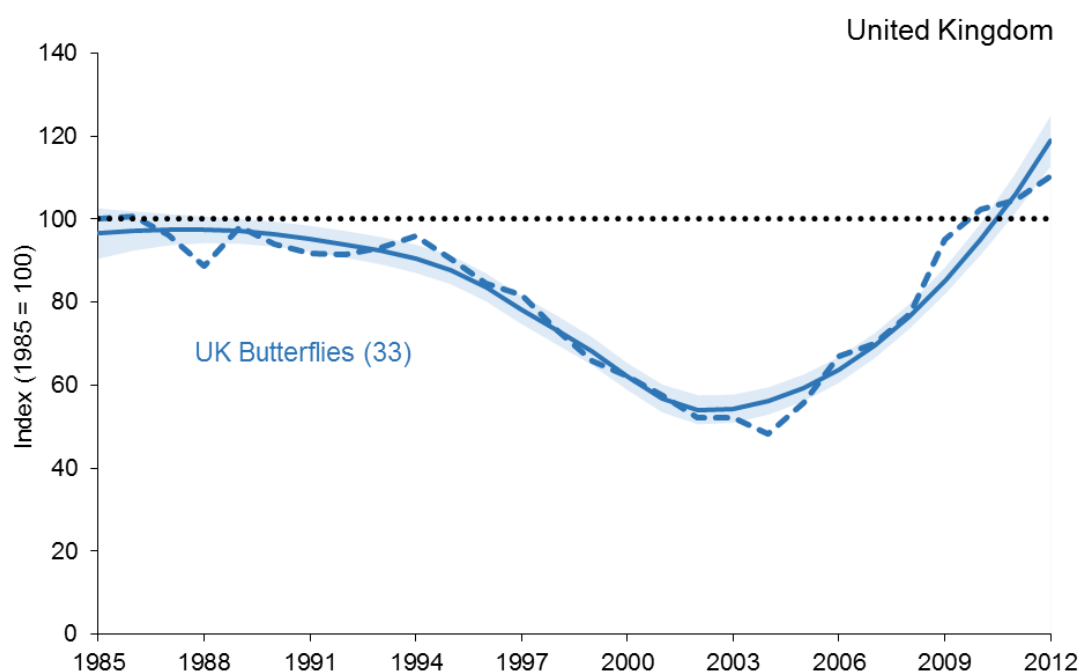
Figure C2ii. **The percentage of species which have shown an increase, decrease or no change in functional connectivity over three time periods.**

United Kingdom
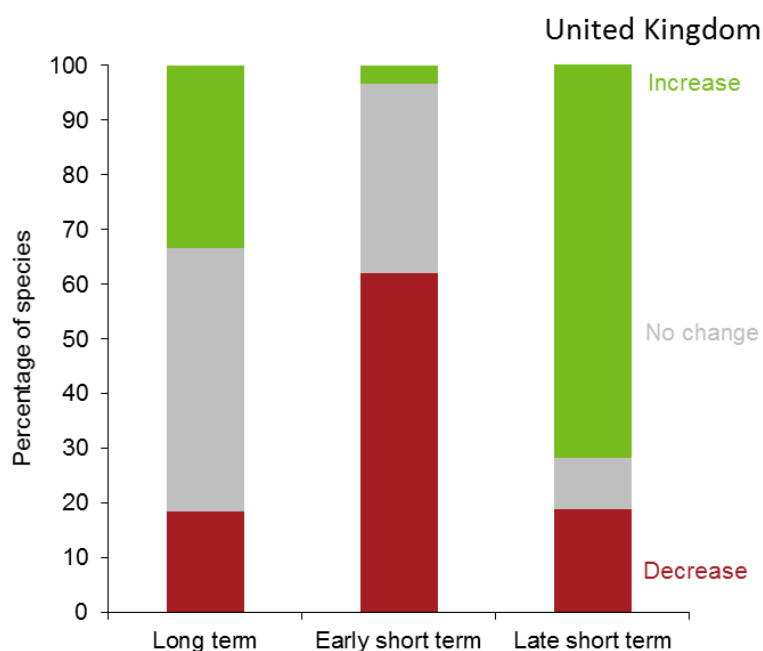
Notes:

1. The number of individual species included in each time period varies due to the availability of data: there were 27 species in the long-term period, 29 in the early short-term period and 32 in the late short-term period. In all 33 species from three habitat types (woodland, grassland, and garden and hedgerows) are included in the indicator.

2. The connectivity index was calculated as the mean value of population synchrony using a 10-year moving window. The index values were extracted from a statistical (mixed effects) model which accounts for other factors known to influence population synchrony, therefore focusing the measure on functional connectivity.

3. The line graph (Figure C2i) shows the unsmoothed average trend (dashed line), and the smoothed average trend (using a LOESS regression function) (solid line) of functional connectivity over time across all 33 species. The shaded area represents the 95% confidence interval around the smoothed average trend.
4. The bar chart (Figure C2ii) shows the percentage of species within the indicator that have shown a statistically significant increase, statistically significant decrease, or no significant change in functional connectivity over three time periods (long term, 1985 to 2012; early short term, 1985 to 2000; and late short term, 2000 to 2012).

Source: UK Butterfly Monitoring Scheme.

C3. Status of European habitats and species

a.   Status of UK habitats of European importance

Type: State Indicator

No new data since the previous publication.

In 2007, 5% of UK habitats listed on Annex I of the Habitats Directive were in favourable conservation status, decreasing to 3% in 2013.

The conservation status of 48% of habitats was unfavourable-improving in 2007, decreasing to 31% in 2013.

The conservation status of 30% of the habitats was unfavourable-declining in 2007, decreasing to 25% in 2013.

Indicator Description

Member States of the European Union are required to report every six years on the conservation status of habitats and species listed on the annexes of the Habitats Directive. Each assessment needs to conclude whether the habitat is in one of the following states: Favourable, Unfavourable-Inadequate, Unfavourable-Bad or Unknown. The indicator is based on an evaluation of whether the results are better or worse in 2013 than in 2007.

Figure C3ai.   Percentage of UK habitats of European importance in improving or declining conservation status in 2007 and 2013.
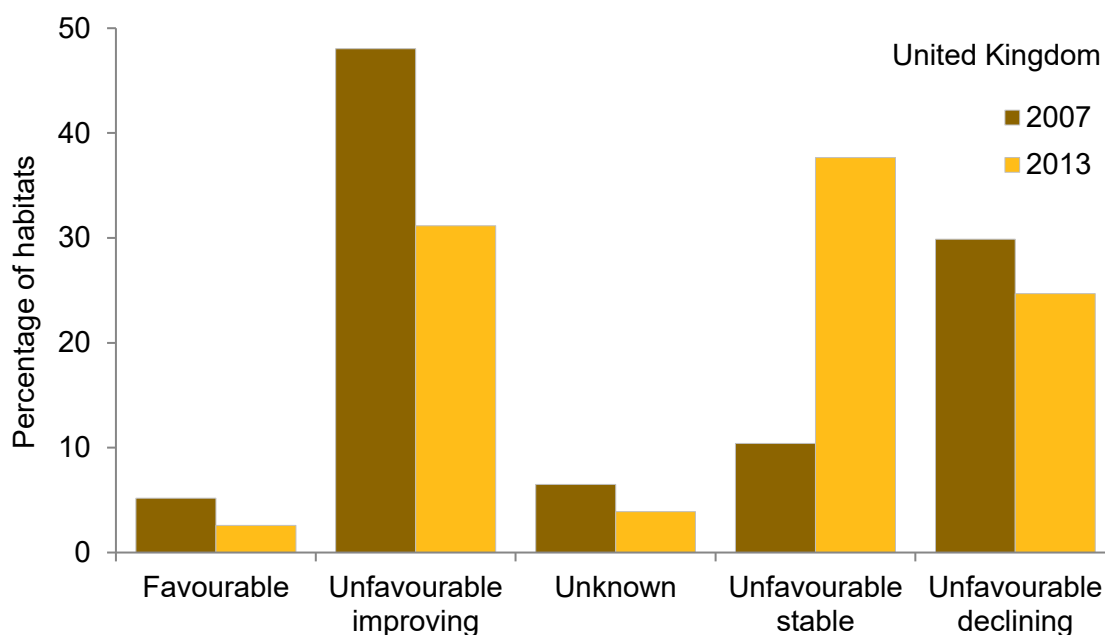
Notes:
1. The chart is based on 77 habitats listed on Annex I of the Habitats Directive.

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)

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

b. Status of UK species of European importance

Type: State Indicator

No new data since the previous publication.

In 2007, 26% of UK species listed on Annexes II, IV or V of the Habitats Directive were in favourable conservation status, increasing to 39% in 2013.

The conservation status of 18% of species was improving in 2007, decreasing to 10% in 2013.

The conservation status of 13% of the species was declining in 2007, increasing to 15% in 2013.

Indicator Description

Member States of the European Union are required to report every six years on the conservation status of habitats and species listed on the annexes of the Habitats Directive. Each assessment needs to conclude whether the species is in one of the following states: Favourable, Unfavourable-Inadequate, Unfavourable-Bad or Unknown. The indicator is based on an evaluation of whether the results are better or worse in 2013 than in 2007.

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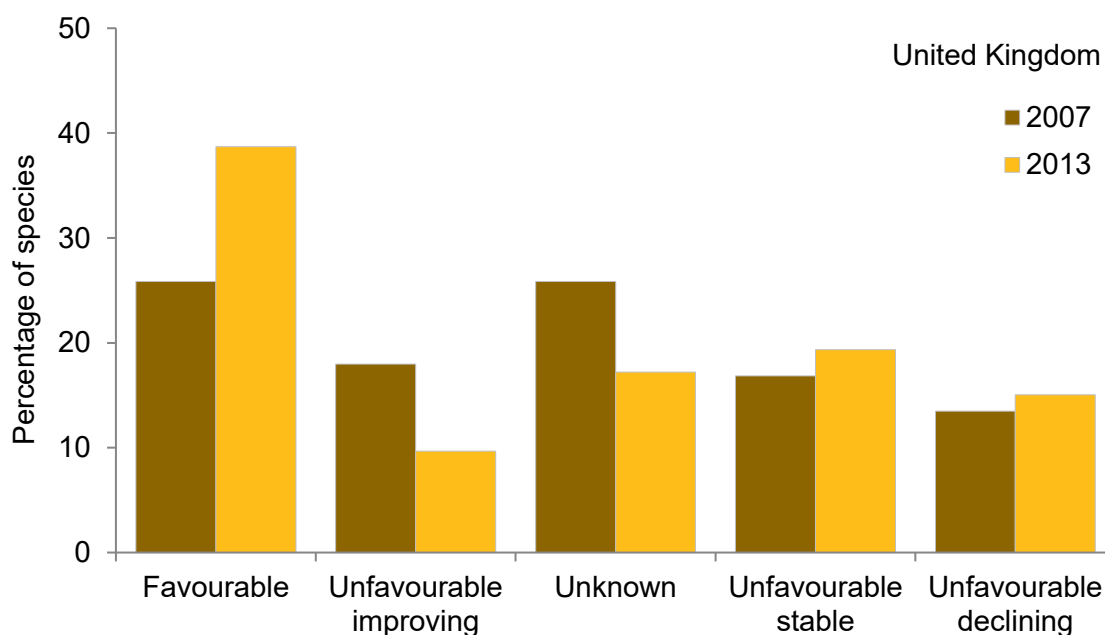
Notes:

1. The number of species assessed was 89 in 2007, and 93 in 2013.
2. The chart is 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)

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

C4. Status of UK priority species

a. Relative abundance

Type: State Indicator

No new data since the previous publication, however a combined evaluation of the long-term change in the relative abundance *and* distribution of priority species (C4a and C4b) has been added to the background section of the online fiche in this update.

Official lists of priority species have been published for each UK country. There are 2,890 species on the combined list; actions to conserve them are included within the respective countries' biodiversity or environment strategies.

By 2015, the index of relative abundance of priority species in the UK had declined to 32% of its value in 1970, a statistically significant decrease. Over this long-term period, 27% of species showed an increase and 73% showed a decline.

Indicator Description

This indicator shows changes in the relative abundance of priority species in the UK for which data are available. The relative abundance of each priority species in this indicator is the estimated population (abundance) of that species in the latest year of the time series taken as a percentage of its estimated population in the earliest year of the time series (i.e. the base year). The indicator will increase when the population of priority species grows on average and decrease when the population declines. This indicator should be read in conjunction with C4b which provides data on those UK priority species for which distribution information is available.

Between 2010 and 2015, the index declined by 18% relative to its value in 2010, again showing a statistically significant decrease. Over this short-term period, 42% of species showed an increase and 58% showed a decline.

Figure C4ai.   Change in the relative abundance of priority species in the UK, 1970 to 2015.

Notes:

1. Based on 215 species. The line graph shows the unsmoothed trend (dotted line) with its 95% confidence interval (shaded).

2. The bar chart shows the percentage of species increasing or declining over the long term (1970 to 2015) and the short term (2010 to 2015).

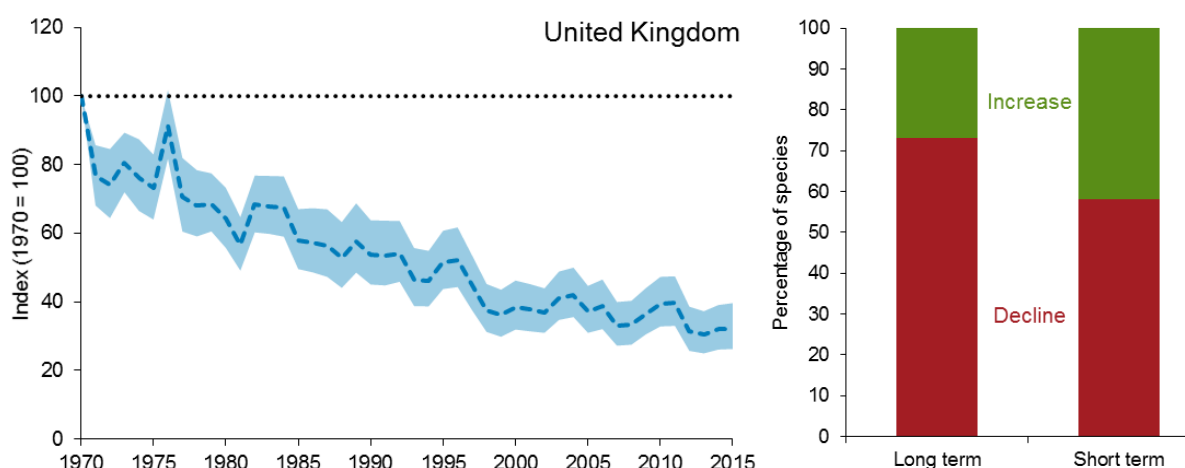3. All species in the indicator are present on one or more of the country priority species lists (Natural Environmental and Rural Communities Act 2006 – Section 41 (England), Environment (Wales) Act 2016 section 7, Northern Ireland Priority Species List, Scottish Biodiversity List).

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**
Priority species – Relative abundance	❌ 1970–2015	❌ 2010–2015	No change (2015)

Of the 2,890 species in the combined priority species list, the 215 for which robust quantitative time series of relative species abundance are available are included in the indicator. These 215 species include birds (103), butterflies (21), mammals (11) and moths (80). This selection is taxonomically limited at present; it includes no vascular or non-vascular plants, fungi, amphibians, reptiles, or fish. The only invertebrates included are butterflies and moths. The 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 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 online fiche and technical background document for more detail.

b.   Distribution

Type: State Indicator

No new data since the previous publication, however a combined evaluation of the long-term change in the relative abundance *and* distribution of priority species (C4a and C4b) has been added to the background section the online fiche of this update.

Official lists of priority species have been published for each UK country. There are 2,890 species on the combined list; actions to conserve them are included within the respective countries' biodiversity or environment strategies.

Between 1970 and 2016, the index was relatively stable; there was an even balance of species increasing and decreasing in distribution and the 5% long-term increase was not statistically significant.

Indicator Description
This indicator measures change in the number of 1km grid squares across the UK in which priority species were recorded in any given year. This is referred to as the 'occupancy index' and is effectively equivalent to changes in the distribution of priority species for which data are available. The indicator will increase when priority species become more widespread on average, and decrease when species becomes less widespread. This indicator should be read in conjunction with C4a which provides data on those species for which abundance information is available.

The index was 3% higher in 2016 than in 2011, with 39% of species showing an increase and 35% showing a decline. Once again, however this short-term increase was not significant.

Figure C4bi.   Change in distribution of UK priority species, 1970 to 2016.
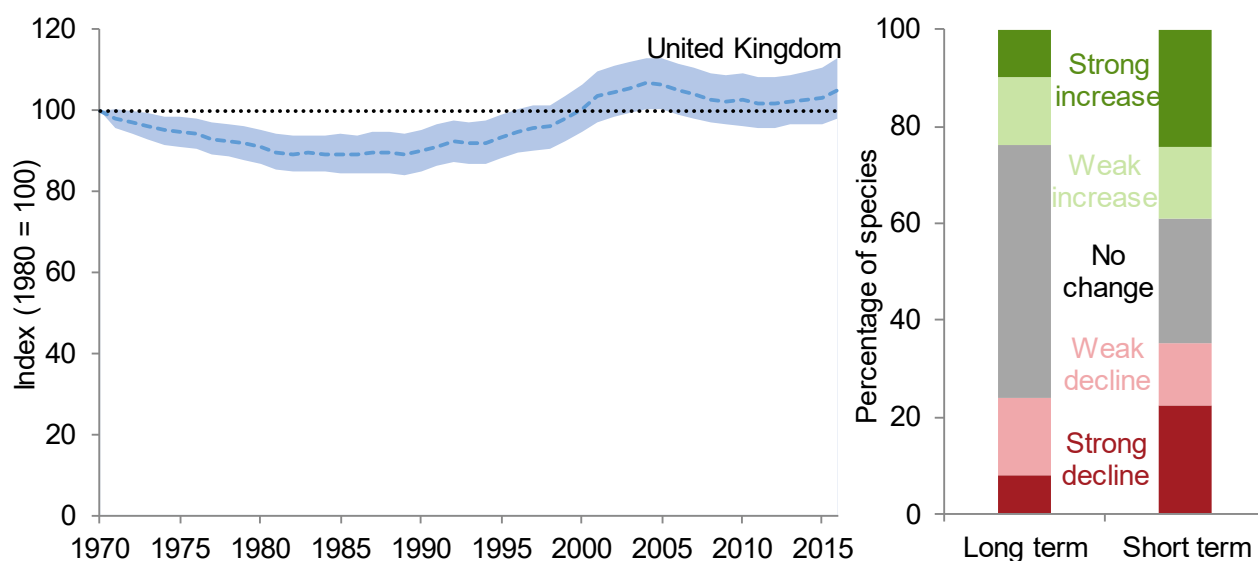
Notes:

1.   Based on 714 species. The graph shows the unsmoothed composite indicator trend (dotted line) with variation around the line (shaded) within which we can be 90% confident that the true value lies (credible interval).

2.   The bar chart shows the percentage of species within the indicator that have increased, decreased or shown no change in distribution (measured as the proportion of occupied sites), based on set thresholds of change.

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), Environment (Wales) Act 2016 section 7, Northern Ireland Priority Species list, Scottish Biodiversity List).

4. As a result of methodological improvements in the occupancy model analysis, a greater number of taxonomic groups and species have been able to be included compared to the 2015 C4b indicator. Therefore, this chart is not directly comparable to previous versions of the indicator.

Source: Biological records data collated by a range of national schemes and local data centres.

Assessment of change in distribution of priority species in the UK			
	Long term	**Short term**	**Latest year**
Priority species – Distribution	≈ 1970–2016	≈ 2011–2016	Increased (2016)

C5. Birds of the wider countryside and at sea

a. Farmland birds

b. Woodland birds

c. Wetland birds

d. Seabirds *– not updated, see note under figure C5di*

e. Wintering waterbirds

Type: State Indicator

In 2016 the farmland bird index was less than half its 1970 value. Short term, between 2010 and 2015, the smoothed index decreased by 9%.

The woodland bird index was 23% less than its 1970 value in 2016. Short term, between 2010 and 2015, the smoothed index showed no significant change.

In 2016 the water and wetland bird index was 8% lower than in 1975. Short term, between 2010 and 2015 the smoothed index showed no significant change.

In 2015 the breeding seabird index was 22% below its 1986 value. Short term, between 2009 and 2014 the index declined by 6% - *see note under figure C5di.*

In 2015/16, the wintering waterbirds index was 87% higher than in 1975/76. Short term, between 2009/10 and 2014/15, the smoothed index fell by 8%.

Indicator Description

The indicator shows relative changes in the abundance of common native birds of farmland and woodland and of freshwater and marine habitats in the UK. Bird populations have long been considered to provide a good indication of the broad state of wildlife in the UK. This is because they occupy a wide range of habitats and respond to environmental pressures that also operate on other groups of wildlife. In addition, there are considerable long-term data on trends in bird populations, allowing for comparison between short-term and long-term changes. Because they are a well-studied taxonomic group, drivers of change for birds are better understood than for some other species groups, which enables interpretation of observed changes.

Figure C5ai.   Breeding farmland birds in the UK, 1970 to 2016.
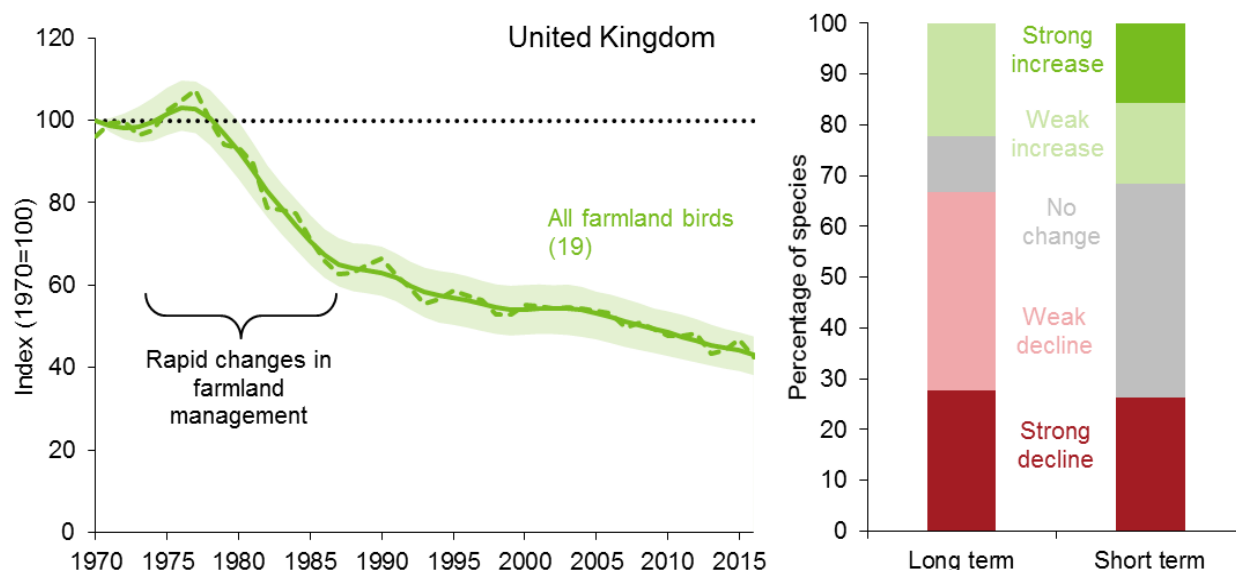
Notes:

1.   The figure in brackets shows the number of species.
2.   The line graph shows the unsmoothed trend (dashed line) and smoothed trend (solid line) with its 95% confidence intervals.
3.   The bar chart shows the percentage of species within the indicator that have increased, decreased, or shown no change, based on set thresholds of annual 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 2016.

Notes:

1.   The figure in brackets shows the number of species.
2.   The line graph shows the unsmoothed trend (dashed line) and smoothed trend (solid line) with its 95% confidence intervals.
3.   The bar chart shows the percentage of species within the indicator that have increased, decreased, or shown no change, based on set thresholds of annual 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 2016.

Notes:

1. The figure in brackets shows the number of species.
2. The line graph shows the unsmoothed trend (dashed line) and smoothed trend (solid line) and its 95% confidence intervals.
3. The bar chart shows the percentage of species within the indicator that have increased, decreased, or shown no change, based on set thresholds of annual change.

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

Figure C5di.   Breeding seabirds in the UK, 1986 to 2015 – not updated, see note below.

Notes:

1. In 2016, the Seabird Monitoring Programme Steering Group made the decision to put the analysis and publication of the annual SMP report on hold for two years. The reason for this was to enable staff time to be dedicated to the breeding seabird census, Seabirds Count. Although data is still being collected, and in higher volumes for the census, the absence of analysed data for 2016 means this indicator has not been updated.
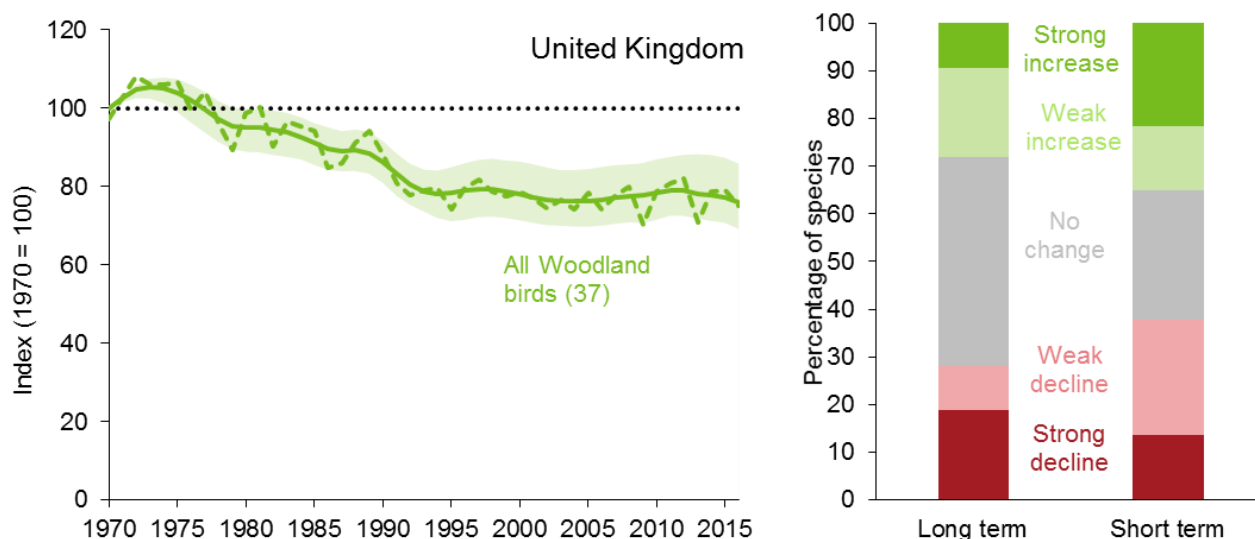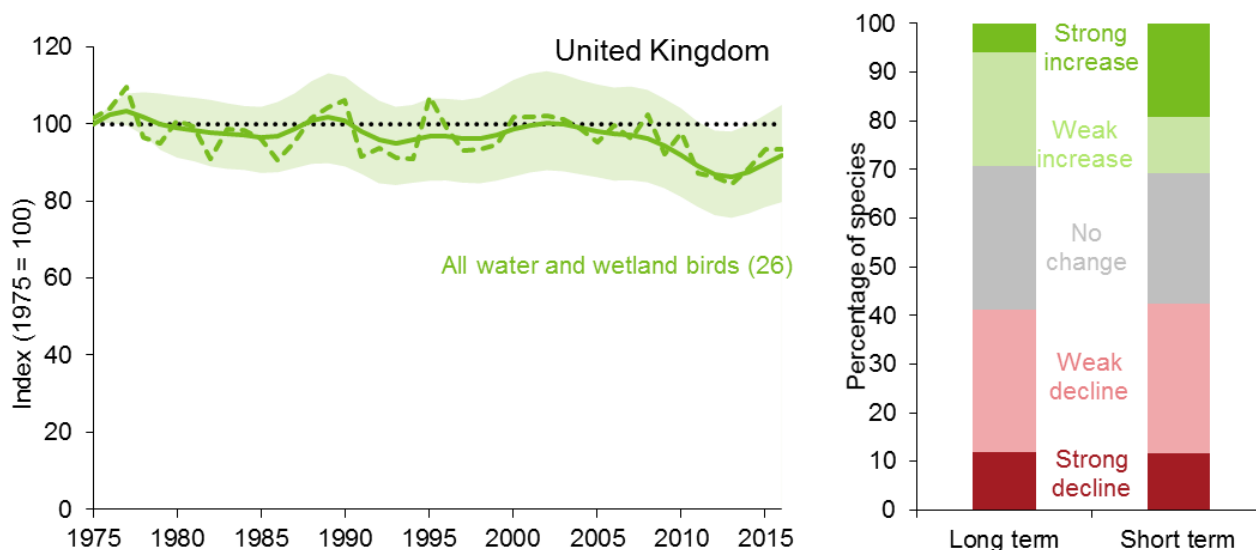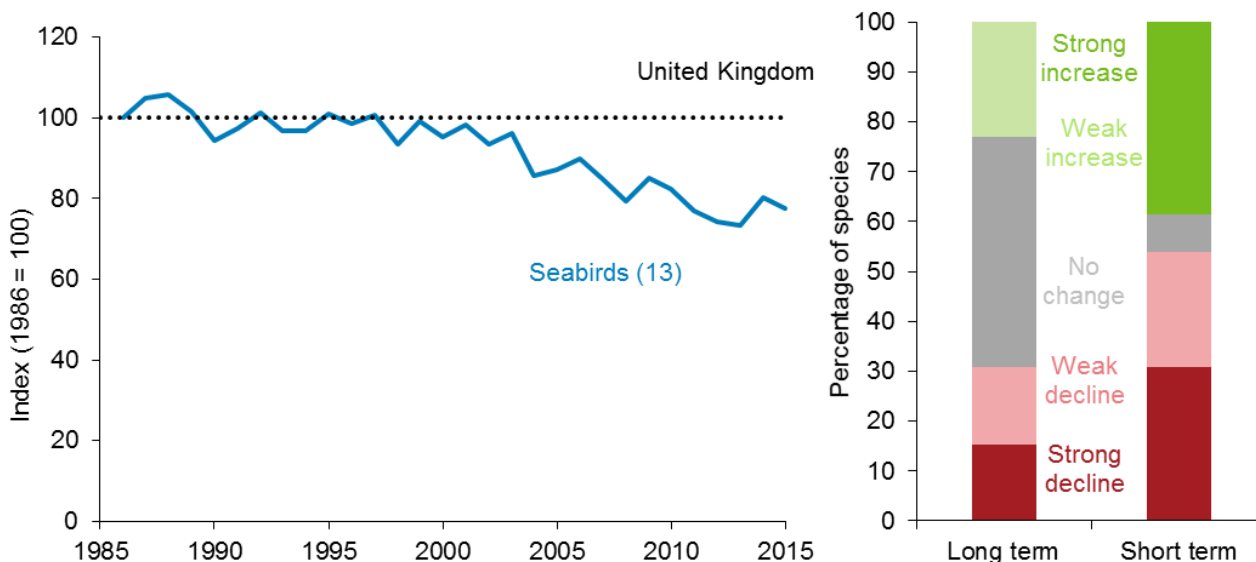2. The figure in brackets shows the number of species.

3. The line graph shows the 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.

4. The bar chart shows the percentage of species within the indicator that have increased, decreased, or shown no change, based on set thresholds of annual change.

Source: British Trust for Ornithology, Defra, Royal Society for the Protection of Birds, Seabird Monitoring Programme (co-ordinated by Joint Nature Conservation Committee).

Figure C5ei.   Wintering waterbirds in the UK, 1975-76 to 2015-16.
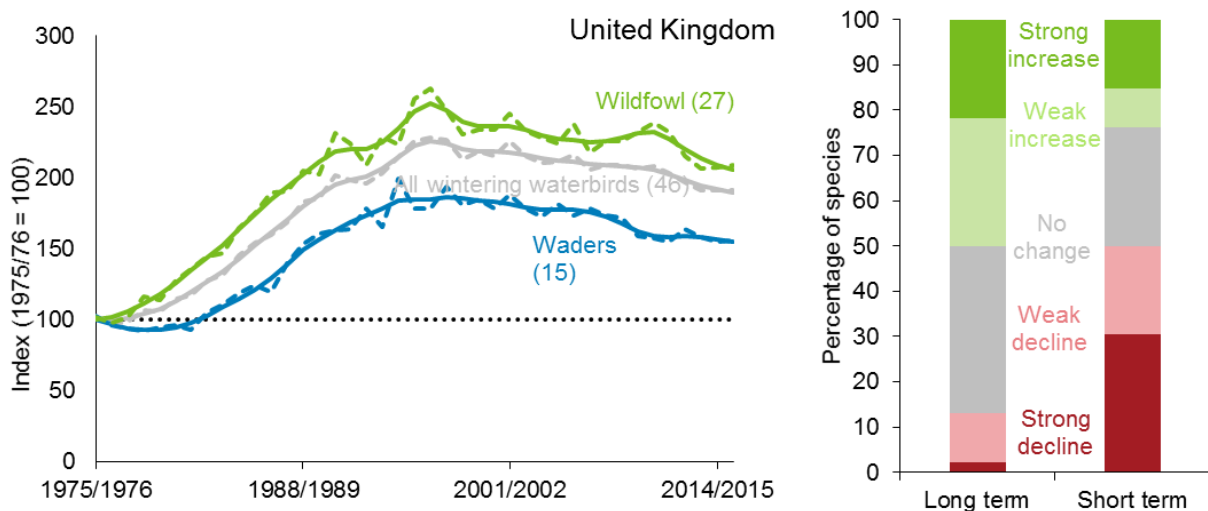
Notes:

1. The figure in brackets shows the number of species.
2. Based on financial years.
3. The line graph shows the 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.
5. The bar chart shows the percentage of species within the indicator that have increased, decreased, or shown no change, based on set thresholds of annual change.

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

Assessment of change in bird populations			
	Long term	**Short term**	**Latest year**
Farmland birds	❌ 1970–2015	❌ 2010–2015	Decreased (2016)
Woodland birds	❌ 1970–2015	≈ 2010–2015	Decreased (2016)
Wetland birds	≈ 1975–2015	≈ 2010–2015	No Change (2016)
Wintering waterbirds	✓ 1975/76–2014/15	❌ 2009/10–2014/15	No change (2015-16)

Notes:

1. Whilst latest year percentage changes in these indices are reported based on the most recent unsmoothed data point (2016), the formal long-term and short-term assessments of the statistical significance of these changes are made using the smoothed data to 2015. This is because the most recent smoothed data point (2016) is likely to change in next year's update when additional data are included for 2017.

2. 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.

3. The traffic light assessment for the seabirds measure has been removed until a way of assessing variability is devised. This follows recommendations in a quality assurance science panel report, dated January 2016.

C6. Insects of the wider countryside (butterflies)

a. Semi-natural habitat specialists

b. Species of the wider countryside

Type: State Indicator

🦋 Since 1976, the habitat specialists butterflies index has fallen by 77%.

🦋 Over the same period, the index for species of the wider countryside has fallen by 46%.

🦋 Large fluctuations in numbers between years are typical features of butterfly populations, principally in response to weather conditions. 2017 was a relatively bad year for butterflies; it was likely due to periods of unfavourable weather during the spring and summer months and pre-ceding winter.

Indicator Description

This indicator consists of two measures of annual butterfly population abundance: the first for specialist butterflies (species strongly associated with semi-natural habitats such as unimproved grassland) and the second for butterflies found in both semi-natural habitats and the wider countryside.

Butterflies are complementary to birds and bats as an indicator, especially the habitat specialists, because they use resources in the landscape at a much finer spatial scale than either of these groups.

🦋 The statistical assessment of change is made on an analysis of the underlying smoothed trends. Since 1976, populations of habitat specialists and species of the wider countryside have declined significantly but both trends show no significant change since 2012.

Figure C6ai. Trends in butterfly populations in the UK: habitat specialists, 1976 to 2017.
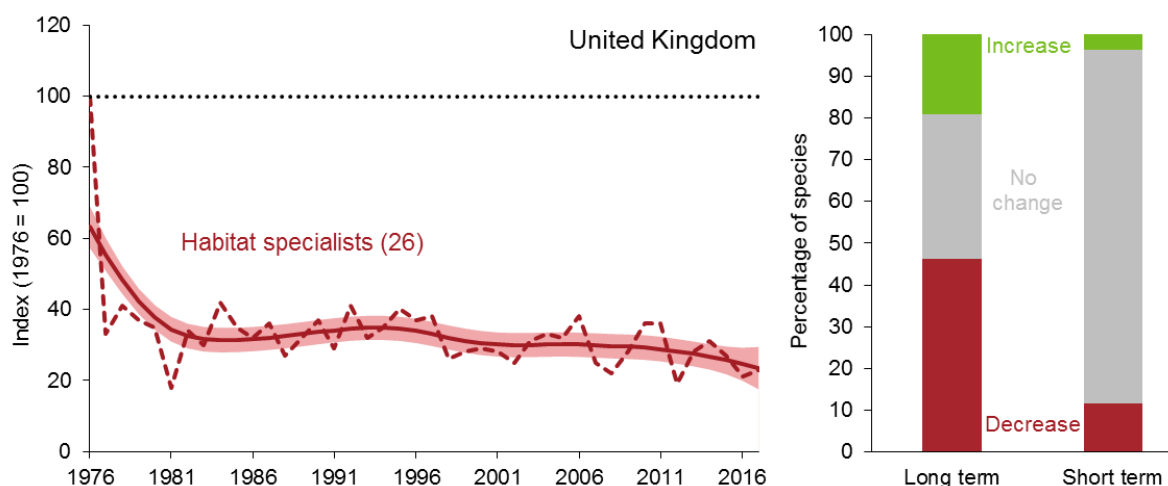
Notes:

1. The figure in brackets shows the number of species included in the index.
2. The graph shows the unsmoothed trend (dashed line) and smoothed trend (solid line) together with its 95% confidence interval (shaded).
3. The bar chart shows the percentage of species within the indicator that have shown a statistically significant increase, a statistically significant decrease or shown no significant change.
4. In 2018, an improved analysis method was used to derive the species indices (see the 'Background' section of the online fiche for further information). The graph is therefore not directly comparable to those in previous versions of this publication.

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 2017.
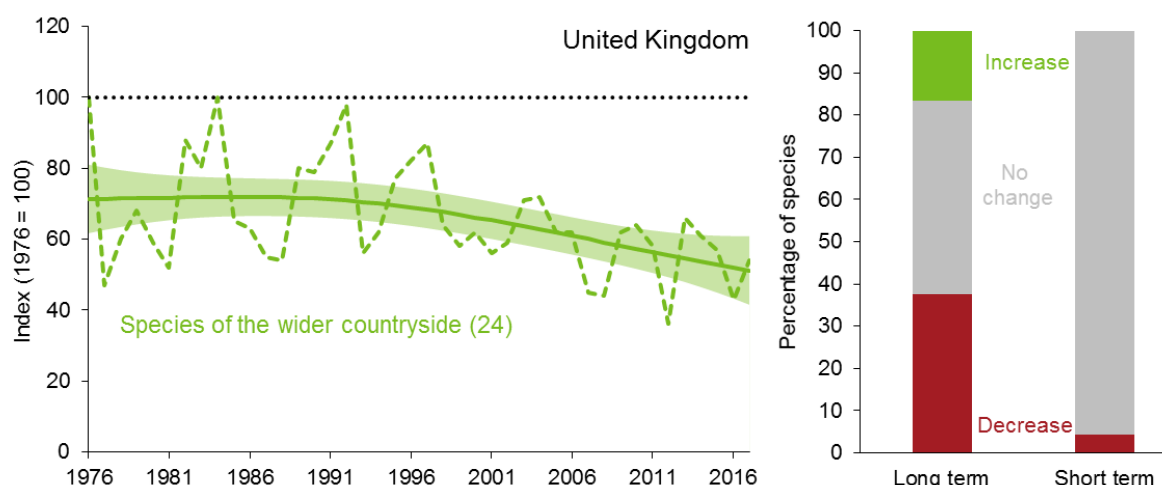
Notes:

1. The figure in brackets shows the number of species included in the index.
2. This indicator includes individual measures for 25 species of butterflies; the wider countryside index, however, only includes 24 trends. This is because an aggregate trend is used for small skipper (*Thymelicus lineola*) and Essex skipper (*Thymelicus sylvestris*);

these 2 species have been combined due to historical difficulties with distinguishing them in the field.

3. The graph shows the unsmoothed trend (dashed line) and smoothed trend (solid line) together with its 95% confidence interval (shaded).

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

5. In 2018, an improved analysis method was used to derive the species indices (see the 'Background' section of the online fiche for further information). The graph is therefore not directly comparable to those in previous versions of this publication.

Source: British Trust for Ornithology, 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	❌ 1976–2017	≈ 2012–2017	Increased (2017)
Species of the wider countryside	❌ 1976–2017	≈ 2012–2017	Increased (2017)

Note: While percentage changes in these indices are reported based on the most recent unsmoothed data point (2017), the formal long-term and short-term assessments of the statistical significance of these changes are made using the smoothed data to 2017. Analysis of the underlying trends is undertaken by the data providers.

C7. Plants of the wider countryside

Indicator under development – progress to date

No update since previous publication.

An indicator of plant species richness has been published previously within the biodiversity indicators set, based on 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 the background section of the online fiche.

Indicator Description

Until 2013, the indicator presented the change in plant species richness in survey plots across Great Britain between 1990 and 2007 for a range of widely occurring habitats. The results from seven habitat types were presented, grouped into three measures for the assessment: arable and horticultural land; woodland and grassland; and boundary habitats. As the data has not been updated since 2007, the data presented previously is considered too out of date to be fit-for-purpose. A new indicator based on the National Plant Monitoring Scheme is being considered, but needs more work before it can be presented as an experimental statistic.

During 2015 and 2016, the Centre for Ecology & Hydrology (CEH), Joint Nature Conservation Committee (JNCC) and Defra have investigated the possibility of using Bayesian occupancy models – see indicators C4b and D1c for details – to identify trends in plant species. Trials have focussed on species that will be monitored with the National Plant Monitoring Scheme (NPMS; see below). Although initial testing using Botanical Society of Britain & Ireland (BSBI) atlas distribution

data is encouraging, the measures under development (for woodlands and for lowland heathland) require further work before they will be fit for publication as experimental statistics. Unfortunately, further development was not possible in 2016-2017; however it is hoped that a new experimental statistic can be developed in the next year or two.

In the slightly longer term it is anticipated that the National Plant Monitoring Scheme designed by the BSBI, CEH, Plantlife and JNCC will provide relative abundance data for around 400 indicator species – which will be more equivalent to the data underpinning the birds, bats and butterfly indicators – allowing a more comparable indicator of plants and habitat trends to be developed. It will not be possible to produce a trend before 2020, as the NPMS was only launched in 2015 and further time is needed to collect enough data to be able to calculate the size and direction of the trend. Initial consideration of possible options for an indicator focussed on plant diversity in the survey plots; a more detailed evaluation of the data is being undertaken to see if trends for individual species within habitats can be derived from the data.

C8. Mammals of the wider countryside (bats)

Type: State Indicator

Between 1999, when trends from standardised large-scale monitoring became available through the National Bat Monitoring Programme (NBMP), and 2016, bat populations have increased by 31%. An assessment of the underlying smoothed trend shows this is a statistically significant increase.

In the short term, between 2011 and 2016, an assessment of the underlying smoothed trend shows that bat populations have shown a 4.7% increase in population size which is statistically significant.

Indicator Description

Bat species make up a third of the UK's mammal fauna and occur in most lowland habitats across the UK. The indicator shows changes in the population size of eight widespread bat species, based on summer field surveys and roost counts and winter hibernation counts. Population change between 1999 and 2017 is analysed using a statistical model developed by the Bat Conservation Trust.

Figure C8i.   Trends in bat populations, 1999 to 2017.
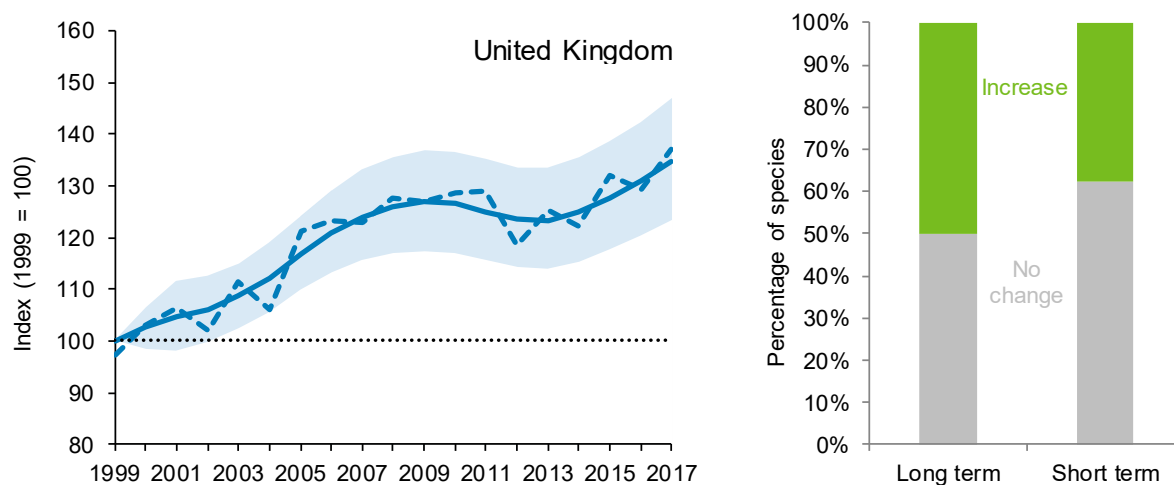
Notes:
1. The headline measure is a composite index of eight bat species: brown long-eared bat, common pipistrelle, Daubenton's bat, lesser horseshoe bat, Natterer's bat, noctule, serotine and soprano pipistrelle.

2. The model used to analyse some individual species trends has changed since the previous publication, and these results are therefore not directly comparable (see the Background section of the online fiche for more details).

3. The line graph shows the unsmoothed trend (dashed line) and smoothed trend (solid line) with its 95% confidence interval (shaded).

4. The bar chart shows the percentage of species which, over the time periods of the long-term and short-term assessments, have shown a statistically significant increase or decline, or no significant change.

Source: Bat Conservation Trust.

Assessment of change in widespread bat populations			
	Long term	**Short term**	**Latest year**
Bat populations	✅ 1999–2016	✅ 2011–2016	Increased (2017)

Note: Long-term and short-term assessments are made on the basis of smoothed trends to the penultimate year (2016) by the Bat Conservation Trust. This is because the most recent smoothed data point (2017) is likely to change in next year's update when additional data are included for 2018. As such, the latest year assessment is based on unsmoothed data.

C9. Genetic resources for food and agriculture

a. Animal genetic resources – effective population size of Native Breeds at Risk

i. Goat breeds

ii. Pig breeds

iii. Horse breeds

iv. Sheep breeds

v. Cattle breeds

Type: State / Benefit Indicator

The average effective population size of the native breeds at risk included in this indicator:

for pigs increased from 176 in 2000 to 192 in 2012, but decreased to 156 in 2017;

for horses decreased from 178 in 2000 to 130 in 2012 and to 127 in 2017;

for sheep increased from 246 in 2000 to 378 in 2012 and to 411 in 2017;

for cattle increased from 89 in 2000 to 206 in 2012 and to 251 in 2017;

Indicator Description

Genetic diversity is an important component of biological diversity. Rare and native breeds of farm animals are part of our cultural heritage, are often associated with traditional land management required to conserve important habitats, and may have genetic traits of value to future agriculture.

The genetic diversity in UK breeds can be assessed by the effective population size (N_e), which accounts for the total number of animals in a population and the relative numbers of sires and dams (male and female parents). A low effective population size signifies a greater likelihood of in-breeding and risk of loss of genetic diversity.

This indicator shows the change in the average effective population sizes for breeds of goats, pigs, horses, sheep and cattle classified by the UK Farm Animal Genetic Resources Committee as Native Breeds at Risk (NBAR)

for goats the dataset starts in 2004 when it was 62, decreasing to 59 in 2012 and increasing to 101 in 2017; prior to 2004, effective population size could only be calculated for one breed.

The *average* effective population sizes calculated between 2000 and 2017 for the native breeds at risk of goats, pigs, horses, sheep and cattle were each above 50, the figure set by the United Nations Food and Agriculture Organisation as a threshold for concern. However, in 2017, of the Native Breeds at Risk, one breed of goat (Toggenburg), three breeds of horse (Cleveland Bay Horse, Eriskay Pony, and Suffolk Punch), and three breeds of cattle (Dairy Shorthorn (original population), Northern Dairy Shorthorn, and Vaynol), had a N_e less than 50. No breeds of sheep or pig had effective population sizes below the threshold in 2017.

There has been no reported UK extinction of any breeds of goats, pigs, horses, sheep or cattle since 1973.

Figure C9ai.   Average effective population size (N_e) of Native Breeds at Risk, 2000 to 2017.
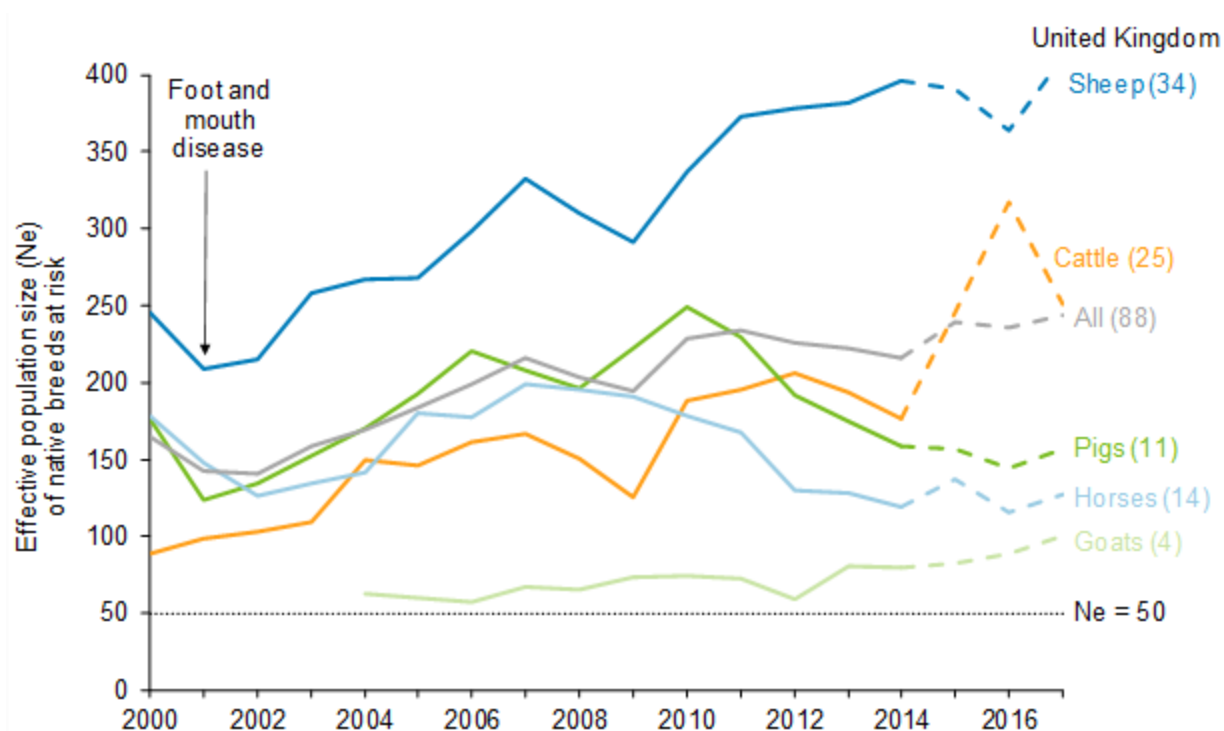
Notes:

1. The number of breeds included in the indicator varies year by year as a result of data availability for both sires and dams (data for both are needed to calculate effective population size). The maximum number of breeds included in each measure is shown in brackets after the species name in the legend. The 2017 values are based on four goat breeds, 11 pig breeds, 13 horse breeds, 31 sheep breeds, and 20 cattle breeds. Further details of how many breeds are included in each year can be found in the online technical background document and the datasheet.

2. Data for 2015, 2016 and 2017 are provisional, hence the last part of the lines are shown as 'dashed'. It is expected that the provisional data can be confirmed later in 2018 (see the online technical document for details).

3. Based on data in the UK Farm Animal Genetic Resources Breed Inventory published on 3 May 2018.

4. Historic data for some breeds of sheep and cattle are now available in the inventory published in 2017 and again in 2018, affecting the series for these species. There have been some minor revisions to previously published data, some going back to 2000. As a

result, this indicator is not directly comparable with the previous publication. The Breed Inventory Results published on 3 May 2018 can be accessed through the following link: https://www.gov.uk/government/statistics/uk-farm-animal-genetic-resources-fangr-breed-inventory-results.

5. The dotted black line shows effective population size (N_e) equal to 50; the level set by the United Nations Food and Agriculture Organisation as a threshold for concern. The pale grey line is an average of all 88 Native Breeds at Risk for which N_e could be calculated; this is included to provide context, but is not assessed.

Source: British Pig Association, Defra, Grassroots, Rare Breeds Survival Trust, and participating breed societies.

Assessment of change in effective population size of Native Breeds at Risk			
	Long term	**Short term**	**Latest year**
Goat breeds	✓ 2004–2017	✓ 2012–2017	Increased (2017)
Pig breeds	✓ 2000–2017	✕ 2012–2017	Increased (2017)
Horse breeds	✕ 2000–2017	✕ 2012–2017	Increased (2017)
Sheep breeds	✓ 2000–2017	✓ 2012–2017	Increased (2017)
Cattle breeds	✓ 2000–2017	✓ 2012–2017	Decreased (2017)

b. Plant genetic resources – Enrichment Index

Type: State / Benefit Indicator

There is considerable annual variability in the number of new accessions into UK germplasm collections. The total number of accessions has risen since 1960, totalling 93,786 accessions by June 2018.

There was a 15% increase in the Enrichment Index between 2013 and 2018. A rapid rise in the Enrichment Index since 2000 can be attributed to a concerted collection effort by the Millennium Seed Bank.

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.

Indicator Description

Seed banks provide an insurance policy against the extinction of plants in the wild. They complement *in situ* conservation methods, which conserve plants and animals directly in the wild. The indicator is based on an enrichment Index developed by the United Nations Food and Agriculture Organisation (FAO 2010) to assess the genetic diversity held in gene banks. The method factors in duplication and similarity to existing accessions. An upward trending line indicates diversity is being added to collections – the steeper the line, the greater the diversity being incorporated.   An accession is a collection of plant material from a particular location at a point in time.

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.

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.

As a result of discussions in the UK Plant Genetic Resources Group, a revised indicator is being considered; this was not available for 2018, but it is hoped that a new indicator will be available for the 2019 publication.

Figure C9bi.   Cumulative Enrichment Index of plant genetic resource collections held in the UK, 1960 to 2018.
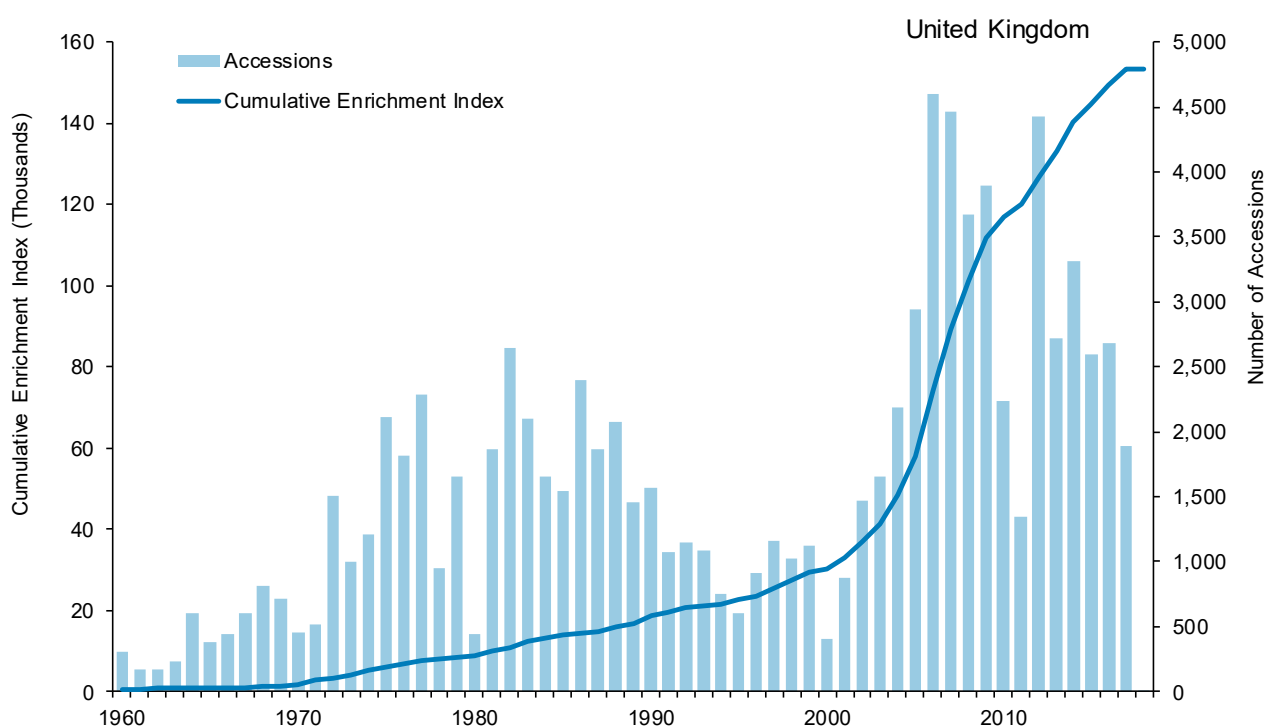
Notes:

1. Data was obtained from EURISCO, which collates information across Europe from national germplasm collections, including the UK National Inventory of Plant Genetic Resources. The UK National Inventory includes food crop genetic resources such as crops, forages, wild and weedy species (including crop wild relatives), medicinal and ornamental plants, but does not include forest genetic resources.

2. The UK 2018 update of EURISCO includes information which had previously not been submitted as a result of improvements within the holding institutes to catalogue their holdings. The indicator is therefore not directly comparable with the versions previously published.

Source: EURISCO Catalogue http://eurisco.ipk-gatersleben.de/apex/f?p=103:1; date of data download 7 June 2018; based on UK contributions from: Genetic Resources Unit, Aberystwyth; Heritage Seed Library, Garden Organic; Commonwealth Potato Collection, The James Hutton Institute; Germplasm Resources Unit, John Innes Centre; Nottingham Arabidopsis Stock Centre; Millennium Seed Bank Partnership; 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	✓ 1960–2018	✓ 2013–2018	No change (2018)

D1. Biodiversity and ecosystem services

a. Fish size classes in the North Sea

Type: State / Benefit Indicator

Since the previous publication additional data are provided for the North Sea and metrics for other regional seas have been restated. The size structure has also been changed from 40cm to 50cm.

In 2016, large fish in the North Sea survey made up 16% of the weight of the fish community. This is close to the value of 20% recorded in 1983 and a noticeable increase from a low of 4% in 2001. While there was a clear decline in the indicator from 1983 to 2001, there has been rapid recovery since and this pace of recovery accelerated after 2010.

Indicator Description

The indicator shows changes in the proportion, by weight, of large individuals equal to or over 50cm in length in demersal (bottom-dwelling) fish populations in the North Sea. Changes in the size structure of fish populations and communities reflect changes in the state of the fish community. Fluctuations in values between years are expected given inter-annual fluctuations in the distribution and abundance of North Sea fish populations and sampling variation.

Figure D1ai. Proportion of large fish (equal to or larger than 50cm), by weight, in the North Sea, 1983 to 2016.
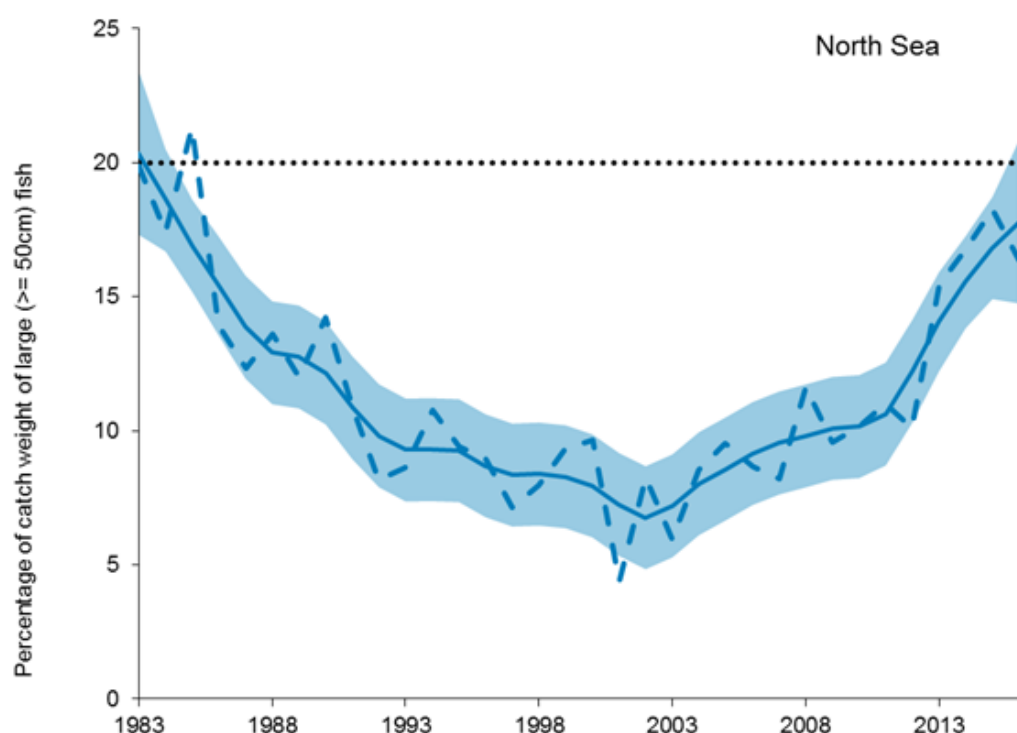
Notes: The line graph shows the unsmoothed trend (dashed line) and a LOESS smoothed trend (solid line) with the shaded area showing the 95 per cent confidence intervals around the smoothed trend. The horizontal dashed line shows the assessment threshold.

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 Sea	≈ 1983–2016	✓ 2011–2016	Decreased (2016)

Notes: The long-term and short-term assessments have been made by the Centre for Environment, Fisheries and Aquaculture Science (Cefas) by fitting a LOESS smoothed trend to the index. LOESS is a non-parametric regression method; it may be understood as standing for "LOcal regrESSion".

b   Removal of greenhouse gases by UK forests

Type: Benefit Indicator

In 2016, forests in the UK are estimated to have removed the equivalent of 23.9 million tonnes (Mt) of carbon dioxide (CO_2) from the atmosphere (Figure D1bii). Cumulatively, since 1990, the equivalent of 587 Mt of CO_2 has been removed by UK forests.

The proportion of removals by broadleaf woodland has increased since the time series began, accounting for 41% (9.8 Mt) of the estimated removals in 2016 compared to 34% (5.9 Mt) of the removals in 1990.

Indicator Description

Forests are a large store of carbon and also act as an active carbon 'sink', removing carbon dioxide (CO_2), a greenhouse gas, from the atmosphere and storing it as carbon in living biomass, leaf litter and forest soil. This sequestration of CO_2 is an essential ecosystem service. This indicator shows the cumulative net removal of greenhouse gases from the atmosphere by UK forests since 1990. It is split between type of woodland (coniferous and broadleaf). Showing greenhouse gas removals by type of woodland is interesting from a biodiversity perspective as it allows a clearer presentation of the contribution made to greenhouse gas removals by broadleaf woodland, most of which constitutes priority habitat.

Figure D1bi.   Cumulative net removal of greenhouse gases by UK forests, 1990 to 2016.
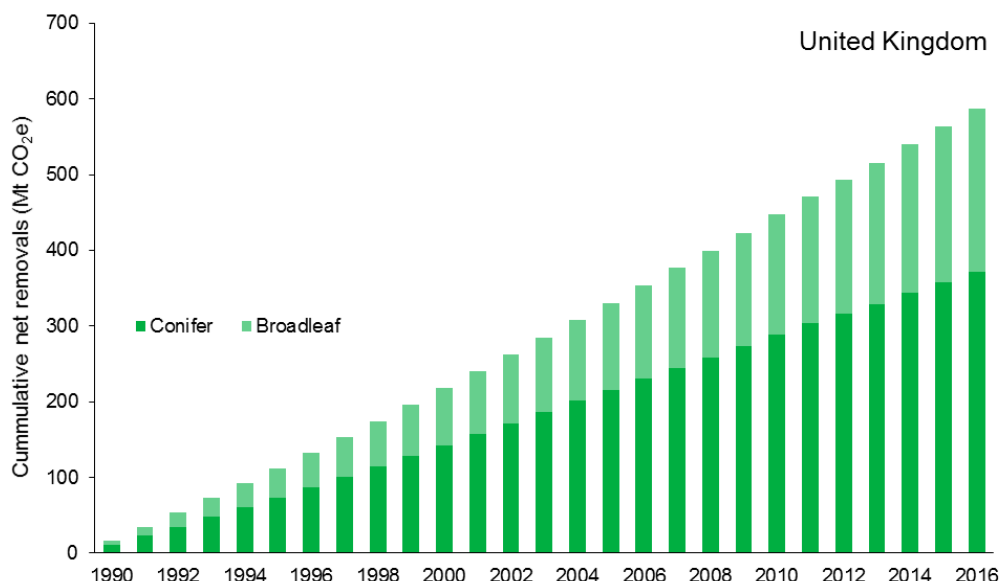
Notes:

1. The bar graph shows the cumulative net removals of greenhouse gases (carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O)) from the atmosphere by forests in the UK, expressed as million tonnes of CO_2 equivalent (Mt CO_2e).

2. Revised in 2015 to reflect improved modelling of greenhouse gas emissions and removals.

3. Revised in 2017 due to improvements made to the forestry sector of the 1990 to 2015 Land Use, Land Use Change and Forestry greenhouse gas inventory.

4. Revised in 2018 due to improvements in the 'CARBINE' model used to calculate the forest carbon stock figures for the 1990 to 2016 Land Use, Land Use Change and Forestry greenhouse gas inventory (see the background section of the online fiche for more details). These results are therefore not directly comparable with those in previous publications.

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

Assessment of change in cumulative net removal of greenhouse gases			
	Long term	**Short term**	**Latest year**
Cumulative net removal of greenhouse gases	✅ 1990–2016	✅ 2011–2016	Increased (2016)

c. Status of pollinating insects

Type: State / Benefit indicator

There was an overall decrease in the pollinators indicator from 1987 onwards. In 2016, the indicator had declined by 22% compared to the value in 1980. The long-term trend was assessed as a decline.

Between 2011 and 2016 the indicator showed a minor increase of 2%, however given the uncertainty, the short-term trend was assessed as stable.

Over the long term, 14% of pollinator species became more widespread (5% showed a strong increase), and 34% became less widespread (13% showed a strong decrease). The ratio between increasing and decreasing species was more balanced over the short term, with 39% of species increasing and 38% of species decreasing.

Indicator Description

This indicator illustrates changes in pollinator distribution (bees and hoverflies) in the UK. The indicator is based on 351 species of pollinator (137 species of bee and 214 species of hoverfly), and measures change in the number of 1km grid squares across the UK in which they were recorded in any given year – this is referred to as the 'occupancy index'. Many insect species are involved in pollination but bees and hoverflies are known to be important and are presented here as an indicator of overall pollinator trend.

As individual pollinator species become more or less widespread, the communities in any given area become more or less diverse, and this may have implications for pollination as more diverse communities are, in broad terms, more effective in pollinating a wider range of crops and wild flowers. Despite the inter-annual variation, the overall trend for pollinators remains downward.

Figure D1ci.   Change in the distribution of UK pollinators, 1980 to 2016.
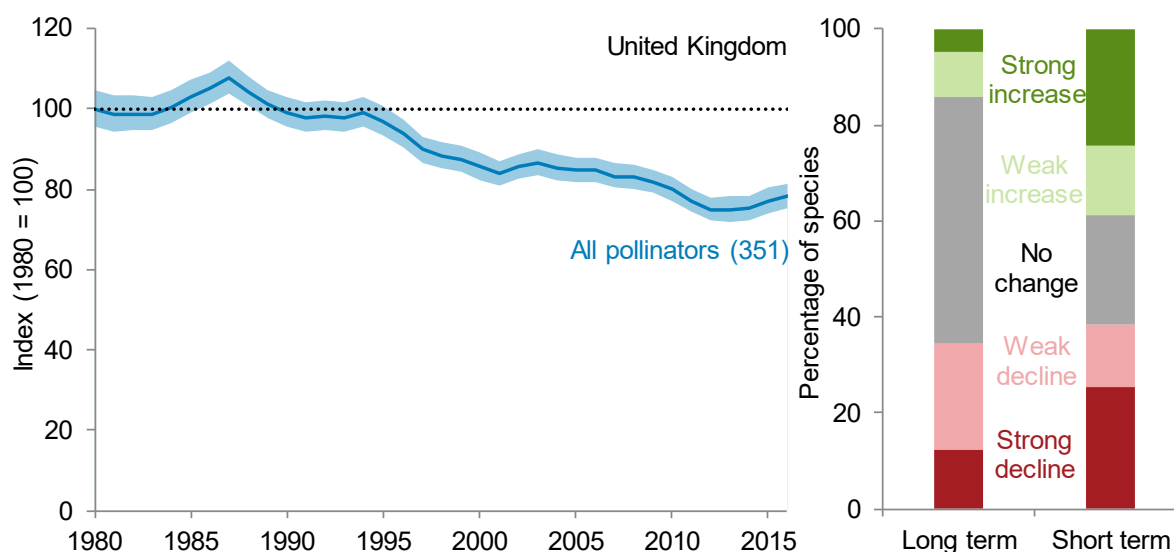
Notes:

1. Based on a total of 351 pollinators, comprising 137 wild bee species and 214 hoverfly species.
2. The graph shows the unsmoothed composite indicator trend with variation around the line (shaded) within which we can be 90% confident that the true value lies (credible interval).
3. The bar chart shows the percentage of species within the indicator that have increased, decreased or shown no change in occupancy, based on set thresholds of change.
4. This indicator is not directly comparable with the previous publication as the Bayesian modelling methods have been improved and 38 species (10 wild bees and 28 hoverfly species) have been removed from the analysis.

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

Assessment of change in distribution of pollinators in the UK			
	Long term	**Short term**	**Latest year**
Distribution of UK pollinators	❌ 1980–2016	😐 2011–2016	Increased (2016)

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

The number of records within the National Biodiversity Network Gateway has increased from 15 million at the start of 2004 to 68.7 million at the start of 2012, and to 131.3 million at the end of March 2017, at which time the Gateway closed and was replaced by the NBN Atlas. Since the start of the NBN Atlas in April 2017 there has been an increase of 81.9 million records to the end of May 2018.

The number of publicly accessible records which are at 1km^2 resolution or better increased from 10.5 million at the start of January 2010, to 35.2 million at the end of March 2017 in the National Biodiversity Network Gateway. The NBN Atlas which started in April 2017 has 126.9 million records at the end of May 2018 which are at 1km^2 resolution or better.

> **Indicator Description**
>
> Good policy making and evaluation is based on evidence. Millions of biological observations (records) have been recorded in the UK over the past century by a wide variety of organisations and individuals. This indicator provides an evaluation of the number of records added to the National Biodiversity Network (NBN) Atlas which replaced the NBN Gateway, in a particular year, and the resolution of those data, as a proxy for the evidence available to underpin conservation decision making.

Figure E1i. **Records added to the National Biodiversity Network, 2004 to 2018.**
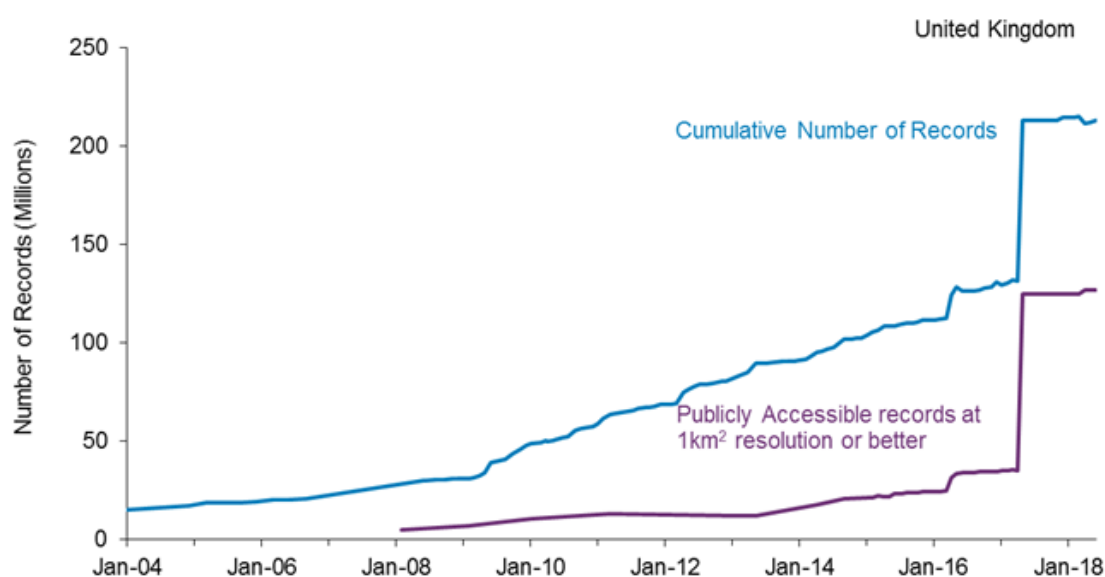
Notes: Data available to 31 May 2018.

Source: National Biodiversity Network.

Assessment of change in data for decision making			
	Long term	**Short term**	**Latest year**
Cumulative number of records	✓ 2004–2018	✓ 2013–2018	No change (2018)
Number of publicly accessible records at 1km² resolution or better	✓ 2008–2018	✓ 2013–2018	Increased (2018)

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

In 2016/17, £445 million of UK public sector funding was spent on biodiversity in the UK; a real-term decrease of 9% since 2015/16 and of 17% over the last 5 years.

Since 2000/01, public sector funding for UK biodiversity relative to gross domestic product (GDP) has fluctuated between 0.02% and 0.04%.

Spending on biodiversity in the UK by non-governmental organisations (NGOs) with a focus on biodiversity and/or nature conservation was £234 million (net of government funding) in 2016/17; a real-term increase of 5% since 2015/16 and of 20% over the last 5 years.

Indicator Description

The first part of this indicator provides real-term, public sector spending on biodiversity alongside spending by non-governmental organisations (NGOs) with a focus on biodiversity and/or nature conservation. Spending is one way of assessing the priority that is given to biodiversity within the UK public sector. The second part of this indicator provides real-term UK public sector spending on global biodiversity. 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.

Figure E2i.   Expenditure on biodiversity in the UK, 2000-01 to 2016-17.
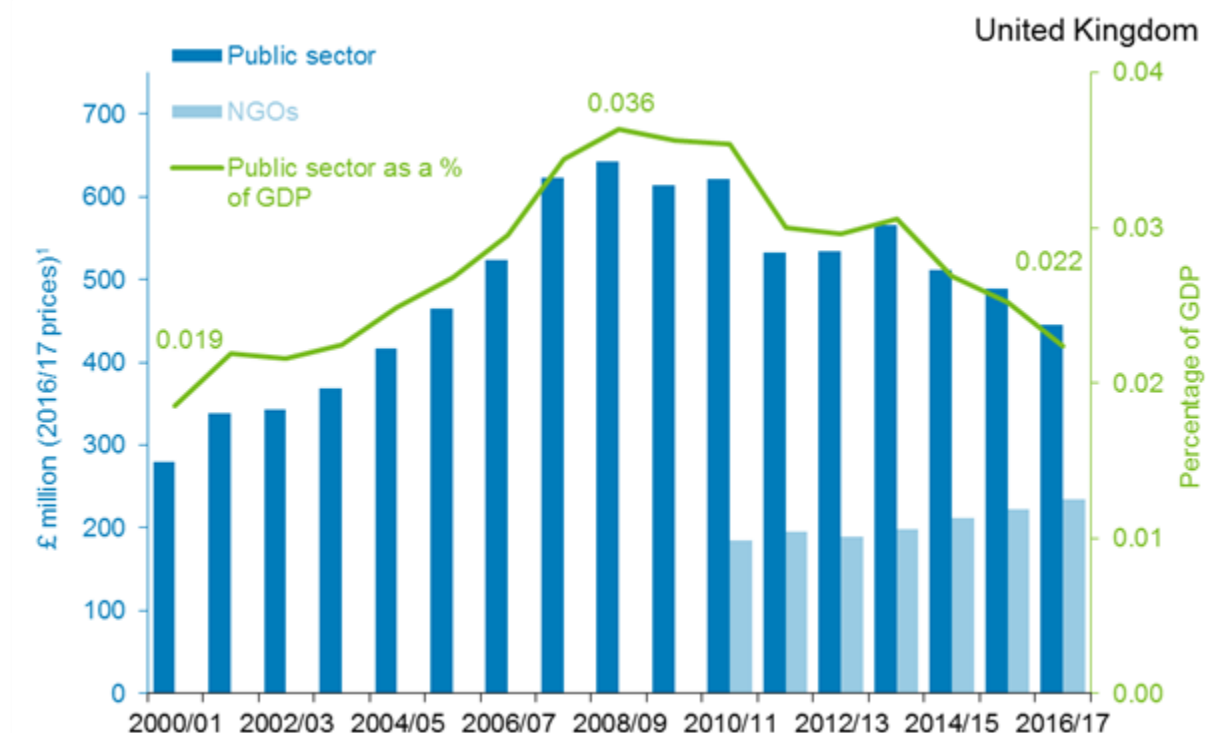
Notes:

1. Deflated using UK Gross Domestic Product (GDP) deflator.
2. Wherever possible, NGO spend is net of government funding.
3. There may be some minor inconsistencies in the reporting of expenditure on UK biodiversity from one year to the next.
4. Revisions to past data series as a result of improved estimation methodology or access to additional data mean the chart (and figures) are not directly comparable to those presented in previous publications (see the background section of the online fiche for further details).

Source: Defra, HM Treasury.

In 2016/17, UK public sector funding for international biodiversity totalled £76 million; a real-term increase of 24% over the last 5 years. Whilst this indicator shows that international expenditure has also increased by 128% since the time series began in 2000/01 and by 24% in the latest year, both these changes have been artificially inflated by the irregular nature of contributions to the Global Environment Facility (GEF) and should, therefore be treated with caution. The long-term and short-term assessments for this indicator, however, use a 3-year average as their baseline, thereby reducing the effect of any large irregular payments such as those to the GEF.

Figure E2ii. **UK public sector expenditure on international biodiversity, 2000-01 to 2016-17.**
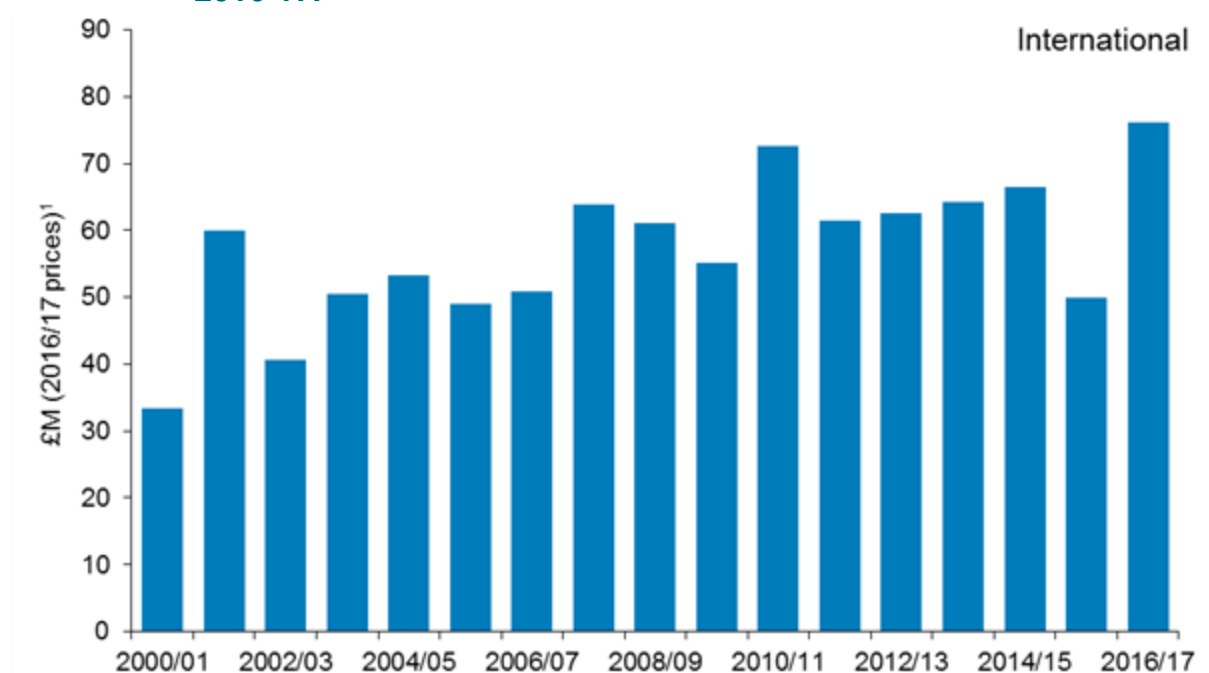
Notes:
1. Deflated using UK Gross Domestic Product (GDP) deflator.
2. There may be some minor inconsistencies in the reporting of expenditure on international biodiversity from one year to the next.
3. Most of the large fluctuations between years are due to the irregular nature of contributions to the Global Environment Facility (GEF), for example, there were large payments in 2001/02 and 2007/08, 2 payments in 2010/11 and no payments in 2015/16.
4. Revisions to past data series as a result of improved estimation methodology or access to additional data (in particular, the timing and magnitude of some large GEF payments) mean the chart (and figures) are not directly comparable to those presented in previous publications.

Source: Defra, HM Treasury.

Assessment of change in public expenditure on biodiversity			
	Long term	**Short term**	**Latest year**
Public sector expenditure on biodiversity in the UK	✓ 2000/01–2016/17	✗ 2011/12–2016/17	Decreased (2015/16–2016/17)
Non-Governmental organisation spending (net of Government funding) on biodiversity in the UK	⊙	✓ 2011/12–2016/17	Increased (2015/16–2016/17)
UK public sector expenditure on international biodiversity	✓ 2000/01–2016/17	✓ 2011/12–2016/17	Increased (2015/16–2016/17)

Note: The latest-year assessment of the UK public sector expenditure on international biodiversity measure is influenced greatly by there being no payments to the GEF in 2015/16.

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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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

Official Statistics

The Statistics and Registration Service Act 2007 defines 'official statistics' as all those statistical outputs produced by the UK Statistics Authority's executive office (the Office for National Statistics) by central Government departments and agencies, by the devolved administrations in Northern Ireland, Scotland and Wales, and by other Crown bodies.

The Act also allows Ministers to determine, through secondary legislation, which non-Crown bodies produce official statistics so that they, too, can be subject to scrutiny and assessment by the Statistics Authority, and be eligible for assessment as 'National Statistics'. This provision is designed to ensure a broad definition of official statistics, as well as flexibility so that the scope of official statistics can be adapted over time to suit changing circumstances.

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'National Statistics' are a subset of official statistics which have been certified by the UK Statistics Authority as compliant with its Code of Practice for Statistics -

> http://www.statisticsauthority.gov.uk/assessment/code-of-practice/

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UK Biodiversity Indicators compendium publication

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 assessed by the UK Statistics Authority as compliant with the Code of Practice.

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

B1b. 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 *individually* designated as National Statistics, they are Official Statistics, and as such have been produced in line with the Code of Practice. They 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.

UK Biodiversity Indicators 2018

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