Department
for Environment
Food & Rural Affairs

Outcome Indicator Framework for the 25 Year Environment Plan: 2021 Update

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Any enquiries regarding this publication should be sent to us at

Environmental Analysis Unit, Department for Environment, Food and Rural Affairs, 1st Floor, Seacole Block, 2 Marsham Street, London, SW1P 4DF.

25YEPindicators@defra.gov.uk

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Outcome Indicator Framework for the 25 Year Environment Plan: 2021 update

Summary

In May 2019, we published the Outcome Indicator Framework. It is a comprehensive set of indicators describing environmental change that relates to the 10 goals within the 25 Year Environment Plan. It describes the state of the environment and supports the strengthened framework for monitoring and reporting on environmental improvement which will be introduced through the Environment Bill. We designed the framework using the concept of natural capital, with guidance from stakeholders and experts.

Our 2021 Outcome Indicator Framework report provides an update on these indicators and their development. This update is published in support of the planned 25 Year Environment Plan Progress Report for 2020-21 which will subsequently draw upon the indicators to inform reporting of government's progress against the plan's 10 goals.

The framework contains 66 indicators, arranged into 10 broad themes. The indicators are extensive; they cover natural capital assets (for example land, freshwater, air and seas) and together they show the condition of these assets, the pressures acting upon them and the provision of services or benefits they provide.

In this report, we provide data corresponding to 45 indicators. This includes statistics for 7 indicators which are newly reported on this year and, where available, updated statistics for indicators previously reported on. Further development of numerous indicators is required and we continue to review, update and develop these to provide an effective, systematic and comprehensive means for measuring environmental change in England.

Section A: Outcome Indicator Framework

Introduction and aim of the Outcome Indicator Framework

The government published the 25 Year Environment Plan in January 2018 setting out goals for improving the environment in England. A commitment was made to develop a comprehensive set of indicators to measure environmental change. These indicators help us to show how the environment is changing over time. This will support the assessment of policies and other interventions, including how we are delivering on international and domestic commitments. In particular, the Outcome Indicator Framework can support the

statutory cycle of monitoring, planning and reporting on progress in improving the environment which will be introduced through the Environment Bill.

The Outcome Indicator Framework report: 'Measuring environmental change: Outcome Indicator Framework for the 25 Year Environment Plan', was published in May 2019. Drawing on advice from a wide range of experts and stakeholders, it presented 66 indicators to give a comprehensive view of the environment and how it is changing. The 2019 report set out in detail the purpose of the Outcome Indicator Framework and examples of how the indicators can be used.

The Outcome Indicator Framework has an important role in our longer-term understanding of the effectiveness of policies and interventions. The indicators are a systematic means of monitoring environmental change, recognising that complex natural and social systems will respond to change on a range of timescales.

The Outcome Indicator Framework will:

- enable clear communication of important environmental trends in England
- provide a set of indicators which relate to all aspects of the environment and all goals within the 25 Year Environment Plan
- communicate data which gives a high-level picture of the environment and how it is changing – more extensive data and indicators may additionally be available from other sources
- be used for assessment of changes in the natural environment, for example against the goals of the 25 Year Environment Plan, or in applying a natural capital approach

In 2020, we presented data showing trends of environmental change for 38 of the framework indicators. In this 2021 update, we present data for 45 of the indicators.

In the remainder of Section A we describe the structure of the framework, how it can be used, and future developments. Section B includes detailed descriptions for all 66 indicators, including trend data for 45 of them.

Structure of the Outcome Indicator Framework

Outcome indicators are:

- based on a natural capital framework – each indicator is assigned as a condition of, pressure on, or service/benefit from, natural capital
- designed to make best use of existing monitoring programmes
- to be used to show changes in the environment over the period of the 25 Year Environment Plan
- voluntarily compliant with the Code of Practice for Statistics and some are official statistics in themselves (see Annex 1: Official statistics)

- reported showing their connections to relevant actions, commitments, targets and strategies as well as links to relevant datasets

The 66 indicators are arranged into 10 broad themes. These are topics that people will generally recognise as relating to different aspects of the environment (for example, air, water, seas and estuaries, wildlife). Some indicators may be applicable to one or more themes but have been allocated to just one of them. A full list of indicators is provided in Table 1 and detailed descriptions of each of the indicators are presented in Section B. The 25 Year Environment Plan goals and targets relevant to each indicator are also detailed within these descriptions.

The inclusion of 66 indicators in the framework provides a comprehensive and systematic means to observe and convey environmental change. However, for some purposes it may not be necessary to examine this large number of indicators. Therefore, in the framework we identify a sub-set of the indicators under 16 headlines (see Table 1). The headline indicators relate to key aspects of the environment which are a focus of policy intervention and should make intuitive sense to a wide range of readers. When complete, the framework will present a large amount of information and so we will highlight key indicators under headlines to provide a way to simplify this information and provide clear communication. Further examples on how the headlines and indicators may be used are given in Section B of the 2019 report.

Tables 1

A list of indicators showing their grouping by theme, headline status (where relevant) and primary goal in the 25 Year Environment Plan. Indicators highlighted in bold are those for which data trends are published in this year's report.

Air

Indicator title	Headline (where relevant)	Primary Goal
A1: Emissions for five key air pollutants	Air quality	Clean air
A2: Emissions of greenhouse gases from natural resources	Greenhouse gas emissions	Mitigating and adapting to climate change
A3: Concentrations of fine particulate matter ($PM_{2.5}$) in the air	Air quality	Clean air
A4: Rural background concentrations of ozone (O_3)		Clean air
A5: Roadside nitrogen dioxide (NO_2) concentrations		Clean air
A6: Exceedance of damaging levels of nutrient nitrogen deposition on ecosystems		Clean air
A7: Area of land exposed to damaging levels of ammonia (NH_3) in the atmosphere		Clean air

Water

Indicator title	Headline (where relevant)	Primary Goal
B1: Pollution loads entering waters		Clean and plentiful water
B2: Serious pollution incidents to water		Clean and plentiful water
B3: State of the water environment	Water and water environment	Clean and plentiful water
B4: Condition of bathing water	Water and water environment	Clean and plentiful water
B5: Water bodies achieving sustainable abstraction criteria	Water and water environment	Clean and plentiful water
B6: Natural functions of water and wetland ecosystems		Clean and plentiful water
B7: Health of freshwater assessed through fish populations		Clean and plentiful water

Seas and estuaries

Indicator title	Headline (where relevant)	Primary Goal
C1: Clean seas: marine litter		Minimising waste
C2: Seabed subject to high pressure from human activity		Thriving plants and wildlife
C3: Diverse seas: status of marine mammals and marine birds	Diversity of our seas	Thriving plants and wildlife
C4: Diverse seas: condition of seafloor habitats	Diversity of our seas	Thriving plants and wildlife
C5: Diverse seas: condition of pelagic habitats		Thriving plants and wildlife
C6: Diverse seas: status of threatened and declining features	Diversity of our seas	Thriving plants and wildlife
C7: Healthy seas: fish and shellfish populations	Health of our seas	Thriving plants and wildlife
C8: Healthy seas: marine food webs functioning	Health of our seas	Thriving plants and wildlife
C9: Healthy seas: seafloor habitats functioning		Thriving plants and wildlife
C10: Productive seas: fish and shellfish stocks fished sustainably		Using resources from nature more sustainably and efficiently
C11: Productive seas: status of sensitive fish and shellfish stocks		Using resources from nature more sustainably and efficiently

Wildlife

Indicator title	Headline (where relevant)	Primary Goal
D1: Quantity, quality and connectivity of habitats	Nature on land and water	Thriving plants and wildlife
D2: Extent and condition of protected sites – land, water and sea	Wildlife and wild places	Thriving plants and wildlife
D3: Area of woodland in England		Thriving plants and wildlife, Enhancing beauty, heritage and engagement
D4: Relative abundance and/or distribution of widespread species	Nature on land and water	Thriving plants and wildlife

D5: Conservation status of our native species	Wildlife and wild places	Thriving plants and wildlife
D6: Relative abundance and distribution of priority species in England		Thriving plants and wildlife
D7: Species supporting ecosystem functions	Nature on land and water	Thriving plants and wildlife

Natural resources

Indicator title	Headline (where relevant)	Primary Goal
E1: Area of productive agricultural land	Production and harvesting of natural resources	Using resource from nature more sustainably and efficiently
E2: Volume of agricultural production		Using resource from nature more sustainably and efficiently
E3: Volume of inputs used in agricultural production	Production and harvesting of natural resources	Using resource from nature more sustainably and efficiently
E4: Efficiency of agricultural production measured by Total Factor Productivity	Production and harvesting of natural resources	Using resource from nature more sustainably and efficiently
E5: Percentage of the annual growth of trees in English woodlands that is harvested		Using resource from nature more sustainably and efficiently
E6: Volume of timber brought to market per annum from English sources		Using resource from nature more sustainably and efficiently
E7: Healthy soils	Production and harvesting of natural resources	Using resource from nature more sustainably and efficiently
E8: Efficient use of water		Using resource from nature more sustainably and efficiently
E9: Percentage of our seafood coming from healthy ecosystems, produced sustainably		Using resource from nature more sustainably and efficiently

Resilience

Indicator title	Headline (where relevant)	Primary Goal
F1: Disruption or unwanted impacts from flooding or coastal erosion	Resilience to natural hazards	Reducing the risks of harm from natural hazards
F2: Communities resilient to flooding and coastal erosion	Resilience to natural hazards	Reducing the risks of harm from natural hazards
F3: Disruption or unwanted impacts caused by drought	Resilience to natural hazards	Reducing the risks of harm from natural hazards

Natural Beauty and Engagement

Indicator title	Headline (where relevant)	Primary Goal
G1: Changes in landscape and waterscape character	Landscapes and waterscapes	Enhancing beauty and engagement
G2: Condition of heritage features including designated geological sites and scheduled monuments	Landscapes and waterscapes	Enhancing beauty and engagement
G3: Enhancement of green/blue infrastructure	Landscapes and waterscapes	Enhancing beauty and engagement
G4: Engagement with the natural environment	People enjoying and caring about the natural environment	Enhancing beauty and engagement
G5: People engaged in social action for the environment	People enjoying and caring about the natural environment	Enhancing beauty and engagement
G6: Environmental attitudes and behaviours	People enjoying and caring about the natural environment	Enhancing beauty and engagement
G7: Health and wellbeing benefits	People enjoying and caring about the natural environment	Enhancing beauty and engagement

Biosecurity, Chemical and Noise

Indicator title	Headline (where relevant)	Primary Goal
H1: Abatement of the number of invasive non-native species entering and establishing against a baseline	Exotic and invasive non-native species	Enhancing biosecurity

H2: Distribution of invasive non-native species and plant pests and diseases	Exotic and invasive non-native species	Enhancing biosecurity
H3: Emissions of mercury and persistent organic pollutants to the environment	Exposure of people and wildlife to harmful chemicals	Managing exposure to chemicals
H4: Exposure and adverse effects of chemicals on wildlife in the environment	Exposure of people and wildlife to harmful chemicals	Managing exposure to chemicals
H5: Exposure to transport noise		Enhancing beauty and engagement

Resource Use and Waste

Indicator title	Headline (where relevant)	Primary Goal
J1: Carbon footprint and consumer buying choices		Minimising waste, Mitigating and adapting to climate change
J2: Raw material consumption	Resource efficiency and waste	Using resource from nature more sustainably and efficiently
J3: Municipal waste recycling rates		Minimising waste
J4: Residual waste arising by type and sector	Resource efficiency and waste	Minimising waste
J5: Prevent harmful chemical from being recycled	Resource efficiency and waste	Managing exposure to chemicals
J6: Waste crime	Resource efficiency and waste	Minimising waste

International

Indicator title	Headline (where relevant)	Primary Goal
K1: Overseas environmental impacts of UK consumption of key commodities	Impacts on the natural environment overseas	No specific 25 Year Environment Plan goal
K2: Developing countries better able to protect and improve the environment with UK support	Impacts on the natural environment overseas	No specific 25 Year Environment Plan goal
K3: Status of endemic and globally threatened species in the UK Overseas Territories	Impacts on the natural environment overseas	No specific 25 Year Environment Plan goal

K4: Extent and condition of terrestrial and marine protected areas in the UK Overseas Territories	Impacts on the natural environment overseas	No specific 25 Year Environment Plan goal

Using the framework

The Outcome Indicator Framework is designed to be adaptable for multiple uses. For example, to communicate environmental change or to support management of natural capital. By presenting a wide variety of data in a single location, the framework enables a holistic approach to analysis of environmental issues and decision making.

The concept of natural capital was used to develop the framework. Natural capital is defined as the 'elements of the environment which provide valuable goods and services to people such as clean air, clean water, food and recreation'. A natural capital approach is advocated by the 25 Year Environment Plan as it accounts for all the different ways the environment benefits society and so can inform better decision making. A natural capital framework sets out the need to:

- reduce pressures on natural capital (for example, pollution or plant disease)
- improve the state of natural assets (including air, water, land and seas)
- increase the benefits that we get from those assets

Figure 1 sets out how the 66 outcome indicators can be considered as either a measure of (a) the pressure on natural capital assets, (b) the extent/condition of natural capital assets or (c) the service or benefit associated with natural capital assets. This classification is not always straightforward since the condition of one natural capital asset (for example, air quality) may place a pressure on another (for example, wildlife habitat). It is important to recognise that multiple interactions occur across the indicators and categories. By classifying these indicators in this way, we can also show which direction of change in the indicator reflects an improvement to the environment (that is a downward trend for pressures and an upward trend for the condition of an asset or the provision of a benefit). This structure is flexible and indicators can be selected as appropriate to the needs of a particular analysis; Several examples of how the indicators may be used to examine specific questions are provided in our 2019 report. Monitoring and evaluation of these indicators can inform appropriate actions with an ultimate goal of maximising a healthy environment, economy and society.

Figure 1, The outcome indicators in a natural capital framework

2021 Update

This 2021 report includes data on environmental trends for 45 of the 66 outcome indicators spanning across 9 of the 10 themes in the Outcome Indicator Framework. Details of which indicators are reported are presented in Table 2.

In this report we update trends for 30 of the 38 indicators reported in 2020, reflecting the most recent available data. The remaining 8 indicators presented in 2020 have not been updated as no new data were available for inclusion in the 2021 report at the time of analysis. The report also includes data for 7 additional indicators newly reported in 2021.

Three of the indicators presented in the 2021 report are classified as 'Experimental Statistics':

- B3 State of the water environment
- H4 Exposure and adverse effects of chemicals on wildlife in the environment
- K4 Extent and condition of terrestrial and marine protected areas in the UK Overseas Territories

These indicators are being published as Experimental Statistics in order to facilitate user involvement in their development – information on how the data have been obtained and how the indicators have been prepared is available via the links in the individual indicator pages of section B. We would welcome any feedback, particularly on the usefulness and value of these statistics, via 25YEPindicators@defra.gov.uk.

In addition, underpinning data for a further 2 indicators – J1 (interim) Carbon footprint and consumer buying choices and J2 Raw material consumption – are sourced from datasets originally published elsewhere as Experimental Statistics.

Of the 45 indicators presented, 28 are described as interim indicators. Interim indicators are those where further development is expected to extend or improve the reporting against the indicator. Reporting interim indicators means that we can communicate data where they are available, whilst recognising that further development is necessary for the indicator to be complete. Examples of circumstances under which an indicator is considered to be interim include: data need to be extracted for England from a UK wide dataset, additional data need to be added to the indicator, or the methods used for deriving an indicator are expected to be further developed. The specific reason why an indicator is currently presented as interim is described in the individual indicator description in Section B. Indicators are described as 'final' indicators where no further significant development is immediately expected, notwithstanding the future development of the framework as a whole.

Due to the impact of the coronavirus pandemic indicator B4 Condition of bathing waters has not been updated due to disruption with data collection and analysis being delayed or

suspended. A statement is included within the indicator's readiness and links to data section noting how it may have implications for future updates.

Tables 2

The 45 indicators for which data trends are reported. Indicators highlighted in **bold** are newly reported on for 2021 (data were not provided for these indicators in 2020). Where multiple years or date-ranges for latest data are reported, these reflect individual datapoints associated with separate elements of the associated indicator.

[a] indicators developed into final indicators for 2021 reporting (interim status in 2020)
[b] indicators presenting the same data as reported in 2020 (updated data are not available)

Air

Indicator title	2021 status	Latest data (year/s)
A1: Emissions for five key air pollutants	Final	2018
A2: Emissions of greenhouse gases from natural resources	Final	2018
A3: Concentrations of fine particulate matter ($PM_{2.5}$) in the air	Final	2019
A4: Rural background concentrations of ozone (O_3)	Final	2019
A5: Roadside nitrogen dioxide (NO_2) concentrations	Final	2019
A6: Exceedance of damaging levels of nutrient nitrogen deposition on ecosystems	Final	2016-18
A7: Area of land exposed to damaging levels of ammonia (NH_3) in the atmosphere	Final	2015-17

Water

Indicator title	2021 status	Latest data (year/s)
B1: Pollution loads entering waters	Interim	2019
B2: Serious pollution incidents to water	Final	2019
B3: State of the water environment	Interim	2019; 2019/20
B4: Condition of bathing water	Final[b]	2019
B5: Water bodies achieving sustainable abstraction criteria	Final	2019
B7: Health of freshwater assessed through fish populations	Interim	2019

Seas and estuaries

Indicator title	2021 status	Latest data (year/s)
C1: Clean seas: marine litter	Interim[b]	2010-2014; 2015

C2: Seabed subject to high pressure from human activity	**Interim**	**2010-2015**
C3: Diverse seas: status of marine mammals and marine birds	**Interim**	**2014; 2015; 2019**
C4: Diverse seas: condition of seafloor habitats	Interim[b]	2010-2015
C5: Diverse seas: condition of pelagic habitats	**Interim**	**2009-2014**
C7: Healthy seas: fish and shellfish populations	Interim[b]	2015/16
C10: Productive seas: fish and shellfish stocks fished sustainably	Interim	2018

Wildlife

Indicator title	2021 status	Latest data (year/s)
D2: Extent and condition of protected site- land, water and sea	Interim	2020
D3: Area of woodland in England	Final	2020
D4: Relative abundance and/or distribution of widespread species	Interim	2019
D6: Relative abundance and distribution of priority species in England	Interim	2016; 2018
D7: Species supporting ecosystem functions	Interim	2017

Natural Resources

Indicator title	2021 status	Latest data (year/s)
E1: Area of productive agricultural land	Final	2020
E2: Volume of agricultural production	Interim	2019
E3: Volume of inputs used in agricultural production	Interim	2019
E4: Efficiency of agricultural production measured by Total Factor Productivity	Interim	2019
E5: Percentage of the annual growth of trees in English woodlands that is harvested	Final	2019
E6: Volume of timber brought to market per annum from English sources	Final	2019
E8: Efficient use of water	**Final**	**2017/18-2019/20**

Natural Beauty and Engagement

Indicator title	2021 status	Latest data (year/s)
G2: Condition of heritage features including designated geological sites and scheduled monuments	Final[b]	2020
G4: Engagement with the natural environment	Interim[b]	2018-19

G5: People engaged in social action for the environment	Interim	2018

Biosecurity, Chemical and Noise

Indicator title	2021 status	Latest data (year/s)
H1: Abatement of the number of invasive non-native species entering and establishing against a baseline	Interim	2019
H2: Distribution of invasive non-native species and plant pests and diseases	Interim	2010-19
H3: Emissions of mercury and persistent organic pollutants to the environment	**Interim**	**2018;2016**
H4: Exposure and adverse effects of chemicals on wildlife in the environment	**Interim**	**Various 2014-2019**

Resource Use and Waste

Indicator title	2021 status	Latest data (year/s)
J1: Carbon footprint and consume buying choices	Interim[b]	2017
J2: Raw material consumption	Final[a]	2017
J3: Municipal waste recycling rates	Interim	2019/20
J4: Residual waste arising by type and sector	Interim	2019
J6: Waste crime	Interim	2018/19; 2019/20

International

Indicator title	2021 status	Latest data (year/s)
K4: Extent and condition of terrestrial and marine protected areas in the UK Overseas Territories	**Interim**	**2020**

A limited number of changes have been made to the indicator descriptions over the last year. These reflect feedback and further consideration and development of the indicators to ensure the most appropriate data are presented.

There have been some specific changes to individual indicators after further consideration of their intended purpose, in order to better reflect alignment with 25 Year Environment Plan commitments and to deliver the insights required to support associated policy needs:

Modification of title for A7 from ‘Area of sensitive habitats exposed to damaging levels of ammonia (NH_3) in the atmosphere’ to ‘Area of land exposed to damaging levels of ammonia (NH_3) in the atmosphere’. This modification is to better reflect the content as a

description of ammonia exposure on all ecosystems, and not exclusively sensitive habitats. The actual data reported remain directly comparable to previous years.

Inclusion of additional metrics for B3 ‘State of the Water Environment’ to provide a more comprehensive insight on the condition of different water body types and on different elements, thus better fulfilling the indicator description.

Extended reporting under B7 ‘Health of freshwaters assessed through fish populations’ to include fish classification data which reflect the status of fish species within rivers in England. This provides a more comprehensive insight as set out by the indicator description.

Modification of title for C3 from ‘Diverse seas: status of marine mammals, birds and fish’ to ‘Diverse seas: status of marine mammals and marine birds’. The removal of fish from this indicator is due to information on fish species population changes separately being reported in C7 ‘Healthy seas: fish and shellfish populations’.

D6 ‘Abundance and distribution of priority species in England’ has been renamed ‘Relative abundance and distribution of priority species in England’ to clarify that it does not present population sizes in absolute terms; it instead presents an index to more simply describe large-scale changes across many species. This indicator additionally reports England-level data this year together with new information describing long and short-term insights.

D7 ’Species supporting ecosystem functions’ additionally reports new information this year, describing long and short-term insights.

A number of indicators remaining in development have recent progress described in respective fiches; see Section B.

Future development

Currently, some indicators are not yet available to report, and further research is required to determine the most suitable data and methods for analysis. We expect additional indicators to be reported in 2022 and subsequent years.

In the future, the Outcome Indicator Framework will be used for assessments of environmental change. Research into potential assessment approaches is taking place considering appropriate statistical techniques and timeframes. This may focus on the indicator headlines and their corresponding indicators (identified in Table 1). Where possible, a baseline near to 2018 (to align with the publication of the 25 Year Environment Plan) will be used as a reference point to assess change. Longer-term (historic) trends will also be presented for comparison where these data are available. Where suitable time-series are available, we will assess both long-term (greater than 5 years) and recent (latest 5 year) trends. Data series of less than 5 years are likely to show year-to-year fluctuations that are difficult to assess. There are also time lags in the environmental

response to interventions. It is expected that the majority of outcome indicators will require longer-term reporting (greater than 5 years) before they may be considered as showing response to policy and other actions.

The technologies for monitoring and assessing change in the environment are advancing rapidly and offer new cost-effective methods (for example, Earth Observations, DNA methods, citizen science/mobile apps and new sensor technologies). We will look to update indicators to reflect these developments when appropriate but will ensure the environmental parameters used for reporting indicators are consistent and so retain the trend time-series.

The Outcome Indicator Framework will be kept under regular review so that it continues to be relevant and provide the best and most cost-effective ways of assessing progress. The framework will be reviewed as a minimum every 5 years.

Section B: Indicator descriptions and data trends

This section provides a technical summary of each of the indicators. For each indicator the summary includes a cross-reference to relevant goals and targets in the 25 Year Environment Plan, the natural capital assets to which it relates and other relevant international reporting commitments. The readiness of each indicator is also assessed in terms of whether it is already published or whether further development is required. Links are provided to relevant data sources and data trends are presented where data are available in appropriate formats. In some instances, interim indicators are presented pending further development of the indicator, this is clearly identified where relevant. The geographic scope refers to intended coverage, any interim deviation from this is specified within individual indicator fiches.

Theme A: Air

A1 Emissions for five key air pollutants

Short description

This indicator shows changes in the emissions of the 5 key air pollutants: sulphur dioxide (SO_2), fine particulate matter ($PM_{2.5}$), nitrogen oxides (NO_X), non-methane volatile organic compounds (NMVOC) and ammonia (NH_3). Air pollution has negative impacts on human health and the environment. Long-term exposure to particulate matter contributes to the risk of developing cardiovascular diseases and lung cancer. As well as being emitted directly, particulate matter can be formed in the atmosphere from reactions between other pollutants, of which SO_2, NO_X, NMVOCs and NH_3 are the most important. NO_X and NH_3 emissions can be deposited in soils or in rivers and lakes, for example, through rain. Resulting nutrient nitrogen deposition affects the nutrient levels and diversity of species in sensitive environments, for example, by encouraging algae growth in lakes and water courses and by producing ozone (O_3) which damages crops and leads to impacts on wildlife through enhanced nutrient levels.

This indicator is an assessment of pressures on the atmosphere caused by the emissions of 5 key pollutants, which when concentrated in the air or deposited have impacts on human health and ecosystems.

Relevant goals in the 25 Year Environment Plan

- Clean air
- Thriving plants and wildlife

Relevant targets in the 25 Year Environment Plan

- Meeting legally binding targets to reduce emissions of 5 damaging air pollutants
- Restoring 75% of our one million hectares of terrestrial and freshwater protected sites to favourable condition, securing their wildlife value for the long term

Position in the natural capital framework

Pressure on natural capital assets

Related reporting commitments

- Emissions Reduction Commitments for the UK

Geographical scope

England

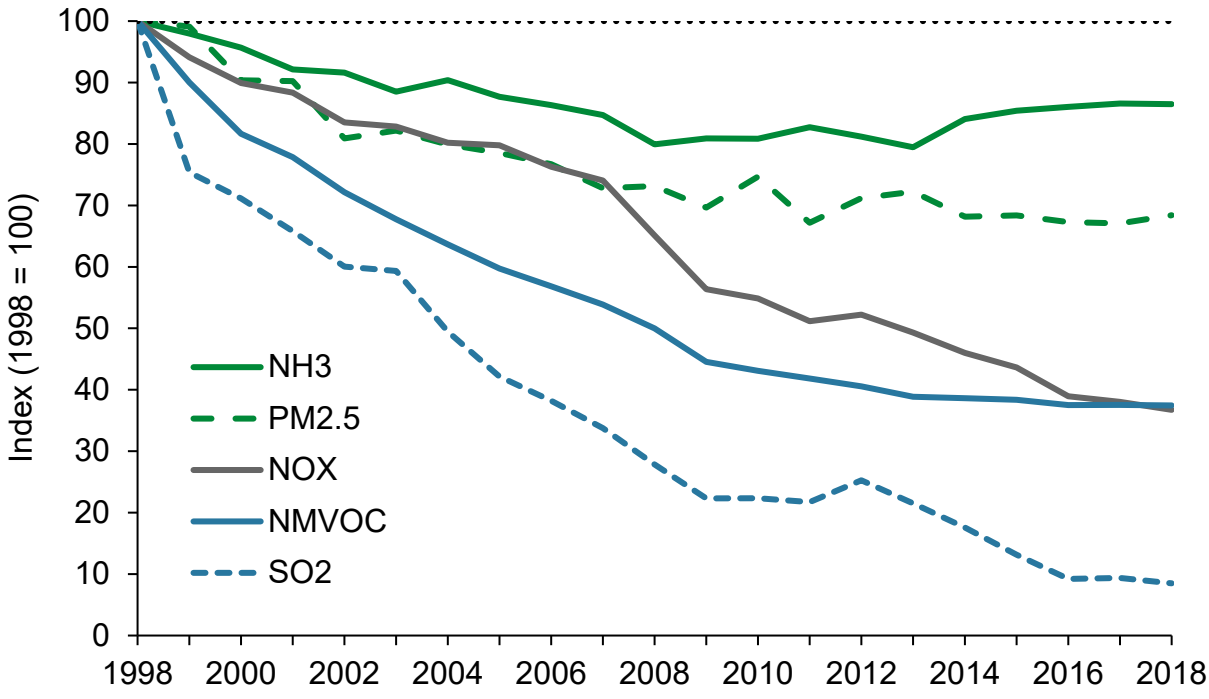
Status of indicator development

Final

Readiness and links to data

Data are published annually in the Air Quality Pollutant Inventories 1990-2018.

Figure A1, Emissions for five key air pollutants in England, 1998 to 2018



Source, Ricardo Energy and Environment

Trend description

Emissions for all 5 key air pollutants (ammonia, fine particulate matter, nitrogen oxides, non-methane volatile organic compounds and sulphur dioxide) in England have fallen over the latest 20 years for which annual, country-level data are available. Emissions of SO_2 have seen the greatest reductions, falling by 92% between 1998 and 2018. Emissions of NMVOCs and NO_x have both fallen by 63%, and emissions of $PM_{2.5}$ and NH_3 have fallen by 32% and 14% respectively over the same time period. More recently, the trends in annual emissions of $PM_{2.5}$ and NMVOC have levelled off and emissions of NH_3 have increased. For $PM_{2.5}$, decreases in emissions from many sources have been partially offset by increases in emissions from residential burning (domestic combustion); emissions of $PM_{2.5}$ from this source increased by 56% between 2007 and 2018.

A2 Emissions of greenhouse gases from natural resources

Short description

This indicator tracks the changes in greenhouse gas emissions from natural resources as described in the Clean Growth Strategy. Greenhouse gases contribute to global climate change which is a pressure on many aspects of our environment. The indicator shows the annual net amount of greenhouse gas emissions from land use and land use change, the forestry, agriculture and waste sectors and from the use of fluorinated gases.

Methodologies from the Wetlands Supplement have been implemented in the 1990 to 2019 Greenhouse Gas Inventory, and so additional net emissions from peatlands will be included in our next update.

Relevant goal in the 25 Year Environment Plan

- Mitigating and adapting to climate change

Relevant targets in the 25 Year Environment Plan

- Continuing to cut net greenhouse gas emissions including from land use, land use change, the agriculture and waste sectors and the use of fluorinated gases
- The UK Climate Change Act commits the UK to reducing greenhouse gas emissions by at least 100% of 1990 levels (net zero) by 2050

Position in the natural capital framework

Pressure on natural capital assets

Related reporting commitments

- UN Framework Convention on Climate Change (UNFCCC) greenhouse gas emissions inventory data for Agriculture, Land Use, Land Use Change and Forestry (LULUCF), Waste Management and Industrial Processes
- The UK Climate Change Act 2008 requires an annual report by the Committee on Climate Change to parliament on whether the UK is on course to meet its carbon budgets and targets

Geographical scope

England

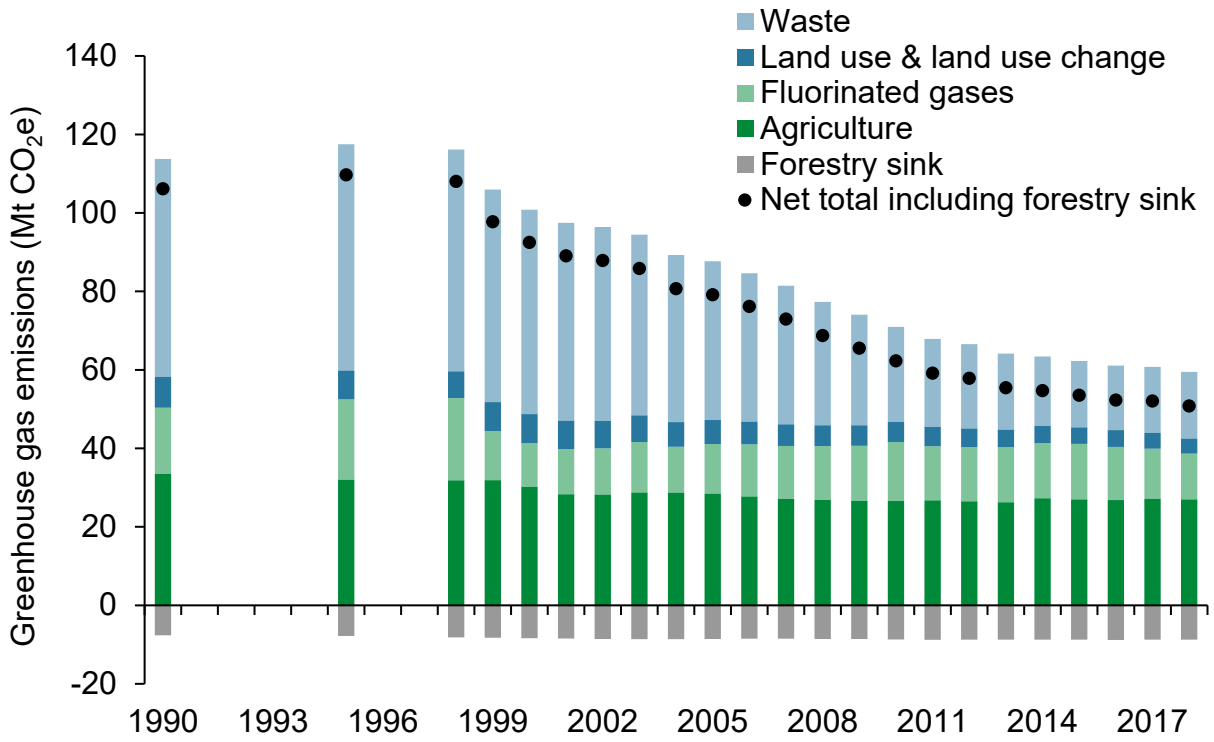
Status of indicator development

Final

Readiness and links to data

Underlying data are already published annually in Greenhouse Gas Inventories 1990-2018.

Figure A2, Emissions of greenhouse gases from natural resources in England by sector, 1990 to 2018



Source, Department for Business, Energy & Industrial Strategy

Note

The data in this indicator are reflective of the current definition for greenhouse gases from natural resources; they may be subject to change in future updates. No data are available for 1991 to 1994 inclusive, 1996 and 1997.

Trend description

After a small initial increase, emissions of greenhouse gases from natural resources (waste, land use and land use change, forestry sink, fluorinated gases, agriculture, net total including forestry sink) in England have fallen by 52%, from 106 million tonnes of carbon dioxide equivalent (Mt CO_2e) in 1990 to 51 Mt CO_2e in 2018. Net greenhouse gas emissions have fallen from all sectors included within this indicator; however, the greatest reduction has been achieved in the waste sector (38 Mt CO_2e or 69%). While emissions from land use and land use change, fluorinated gases and from agriculture have fallen by 52%, 31% and 19% respectively, and net removals by the forestry sector have increased by 14%, the total net improvements in these 4 sectors combined (16 Mt CO_2e) is less than half of that achieved in the waste sector. More recently, for example in the latest 10 years, net emissions of greenhouse gases from: the waste sector; land use and land use change; and fluorinated gases have all continued to fall at similar rates to those seen over the long term, whereas improvements in net removals by the forestry sector have slowed and net emissions from agriculture have fluctuated but show little overall change between 2008 and 2018.

A3 Concentrations of fine particulate matter ($PM_{2.5}$) in the air

Short description

This indicator is a measure of the level of long-term exposure of people to harmful airborne fine particulate matter ($PM_{2.5}$). Long-term exposure to particulate matter contributes to the risk of developing cardiovascular disease and lung cancer. The main sources of $PM_{2.5}$ pollution are industrial processes, combustion in residential, public, commercial and agricultural sectors and road transport.

This indicator is an assessment of clean air (reporting the condition of the atmosphere as an asset). It can also be considered as pressure on human health. It is determined by calculating the annual population-weighted mean concentration of $PM_{2.5}$ in the air, assessed as background concentrations per 1 km square. The population-weighted mean concentration is used as a measure of the impact of $PM_{2.5}$ on the health of the total population. Greater weighting is given to concentrations of $PM_{2.5}$ in urban areas to reflect the higher population density as those concentrations will affect a greater number of people. In addition, people living in urban areas are generally exposed to greater levels of $PM_{2.5}$ than those living in rural areas.

Relevant goal in the 25 Year Environment Plan

- Clean air

Relevant target in the 25 Year Environment Plan

- Meeting legally binding targets to reduce emissions of 5 damaging air pollutants (including primary $PM_{2.5}$ and precursor pollutants that contribute to secondary $PM_{2.5}$ in the atmosphere)

Position in the natural capital framework

Condition of asset – atmosphere

Related reporting commitments

- None

Geographical scope

England; also available at local authority level.

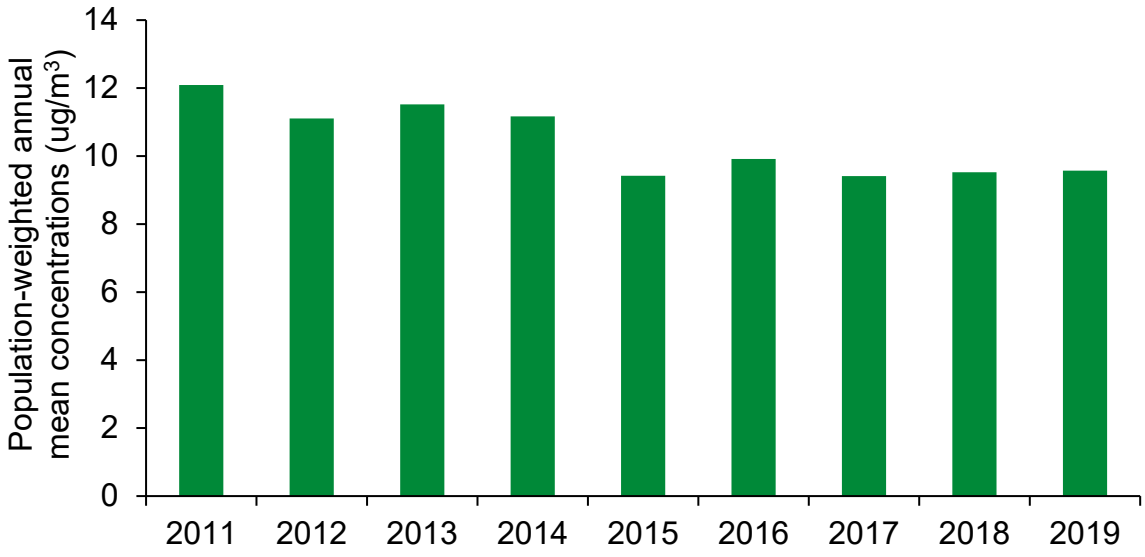
Status of indicator development

Final

Readiness and links to data

Data are already published annually at UK Air Information Resource, Modelled background pollution data.

Figure A3, Concentrations of fine particulate matter ($PM_{2.5}$) in England, 2011 to 2019



Source, Defra

Note

$PM_{2.5}$ annual mean concentrations are estimated annually for every square kilometre of the UK through the Pollution Climate Mapping (PCM) model. The geographical distribution of the UK population is then joined to the estimated concentrations to estimate the annual mean concentration of $PM_{2.5}$, weighted on where the population lives. This enables us to account for the majority of the population living in densely populated urban areas, where concentrations are likely to be greatest.

Trend description

Population-weighted annual mean concentrations of fine particulate matter ($PM_{2.5)}$ in England have declined from 12.1 ug/m^3 in 2011 to 9.6 ug/m^3 in 2019, a fall of 21% over the latest 8 years for which data are available.

A4 Rural background concentrations of ozone (O_3)

Short description

This indicator tracks changes in rural background concentration of ozone (O_3). Chemical reactions in the air involving nitrogen oxides (NO_X) and volatile organic compounds (VOCs) produce the toxic gas O_3 which can harm health, damage wild plants, crops, forests and some materials, and is a greenhouse gas contributing to global warming.

This indicator is an assessment of clean air (reporting the condition of the atmosphere as an asset). It can also be considered as a pressure on human health and thriving plants and wildlife. It is determined by calculating the annual average of the maximum daily 8-hour mean concentrations of O_3 measured at all rural measurement sites on Defra's Automatic Urban and Rural Network (AURN).

Relevant goals in the 25 Year Environment Plan

- Clean air
- Thriving plants and wildlife

Relevant targets in the 25 Year Environment Plan

- Meeting legally binding targets to reduce emissions of 5 damaging air pollutants (some of which are O_3 precursors)
- Restoring 75% of our one million hectares of terrestrial and freshwater protected sites to favourable condition, securing their wildlife value for the long term

Position in the natural capital framework

Condition of asset – atmosphere

Related reporting commitments

- Air Quality Standards Regulations 2010. Measurements from the UK AURN form part of the annual assessment of air quality against the limit and target values specified by this legislation

Geographical scope

England

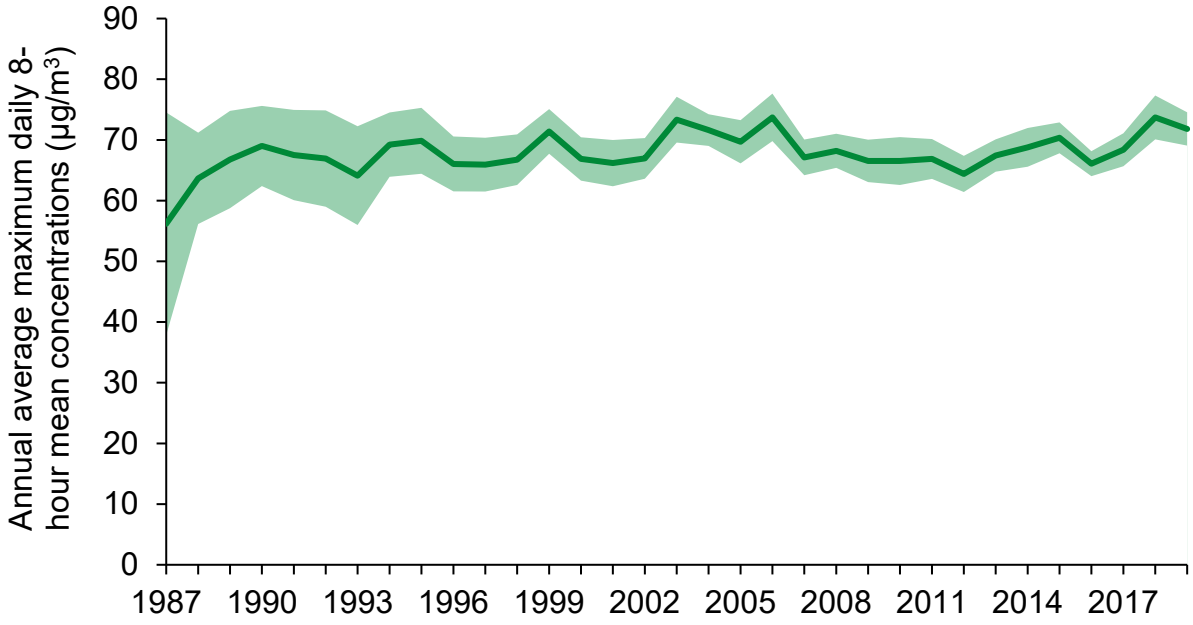
Status of indicator development

Final

Readiness and links to data

Data are already published annually as National Statistics, Air Quality Statistics.

Figure A4, Rural background concentrations of ozone (O_3) in England, 1987 to 2019



Source, Defra

Note

The shaded area in the graph represents the 95% confidence interval (measure of uncertainty) for the annual mean concentration of O_3 measured at rural background sites.

The interval narrows over time because of an increase in the number of monitoring sites and a reduction in the variation between annual means for O_3.

Trend description

The average daily maximum 8 hour mean concentration of ozone has fluctuated since the beginning of the time series in 1987. It was 72 µg/m^3 in 2019; a 28% increase in concentration compared to 1987 but a slight decrease in concentration compared to 2018 (74 µg/m^3). Some variance from year to year is expected due to fluctuations in the occurrence of hot summer weather conditions which are associated with high ozone concentrations.

A5 Roadside nitrogen dioxide (NO_2) concentrations

Short description

This indicator tracks changes in average roadside concentration of nitrogen dioxide (NO_2). NO_2 arises predominantly from combustion sources such as traditionally fuelled vehicles and therefore the highest concentrations are often found at roadside locations.

This indicator is an assessment of clean air (reporting the condition of the atmosphere as an asset). It can also be considered as a pressure on human health. It is determined by calculating the average value of the annual mean concentrations measured across Defra's Automatic Urban and Rural Network (AURN) at all roadside locations (with greater than 75% data capture in any one year).

Relevant goals in the 25 Year Environment Plan

- Clean air

Relevant targets in the 25 Year Environment Plan

- Meeting legally binding targets to reduce emissions of 5 damaging air pollutants (including NO_2)

Position in the natural capital framework

Condition of asset – atmosphere

Related reporting commitments

- Air Quality Standards Regulations 2010. Measurements from the UK AURN form part of the annual assessment of air quality against the limit and target values specified by this legislation

Geographical scope

England; data from individual monitoring sites are also available.

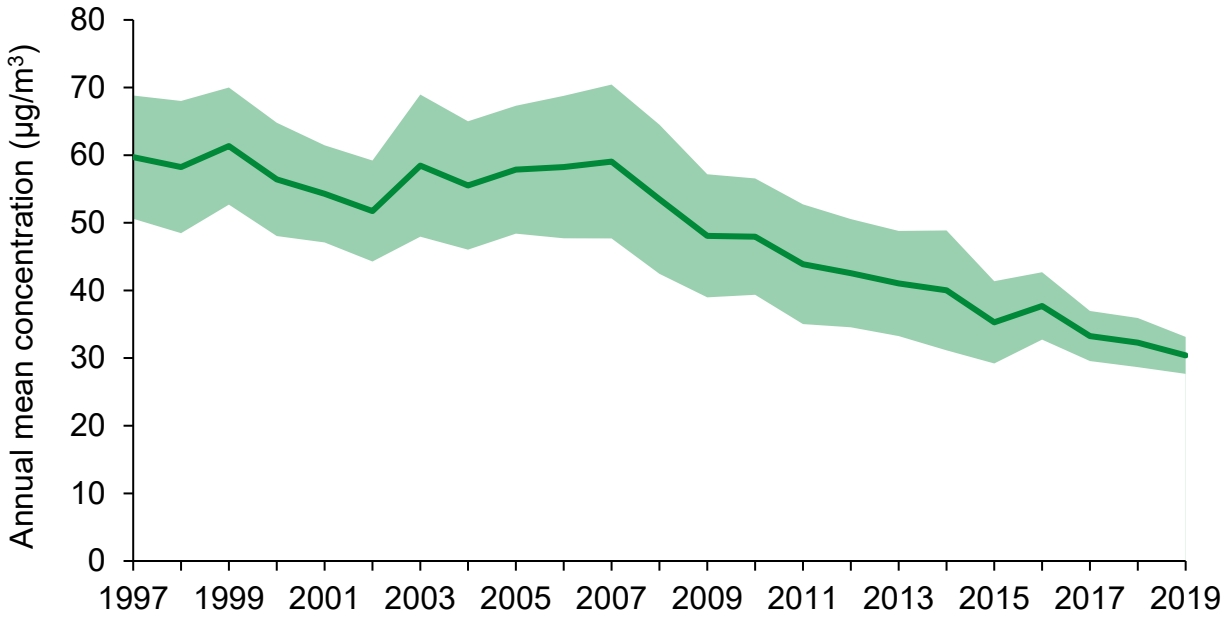
Status of indicator development

Final

Readiness and links to data

Data are already published annually as National Statistics; Air Quality Statistics.

Figure A5, Roadside nitrogen dioxide (NO_2) concentrations in England, 1997 to 2019



Source, Defra

Note

The shaded area in the graph represents the 95% confidence interval (measure of certainty) for the annual mean concentration of NO_2 measured at roadside sites. The interval narrows over time because of an increase in the number of monitoring sites and a reduction in the variation between annual means for NO_2.

Trend description

Concentrations of roadside NO_2 in England have fallen from 60 µg/m^3 in 1997 to 30 µg/m^3 in 2019, a drop of 49% over the latest 22 years for which data are available. Although the general trend in measured NO_2 concentrations is decreasing and falls below the NO_2 limit value of 40µg/m^3 in recent years, there are hotspots of NO_2 exceedances which are being addressed through the NO_2 plans.

A6 Exceedance of damaging levels of nutrient nitrogen deposition on ecosystems

Short description

This indicator shows changes in average accumulated exceedance and percentage of sensitive areas exceeding the internationally agreed threshold for harmful effects (critical load) for nutrient nitrogen deposition across sensitive habitats. The damaging nutrient nitrogen comes predominantly from ammonia (NH_3) but partly nitrogen oxides (NO_X) and long-range transport of air pollutants.

This indicator is an assessment of clean air (reporting the condition of the atmosphere as an asset). It can also be considered as pressure on thriving plants and wildlife. It is determined by calculating the area of sensitive habitat exceeding the internationally agreed threshold for likely damaging effects from reactive nitrogen deposition in both oxidised and reduced forms, termed the critical load. It uses modelled interpolations of atmospheric concentrations of NO_X and NH_3 and models deposition processes based on internationally agreed methodology.

Relevant goals in the 25 Year Environment Plan

- Clean air
- Thriving plants and wildlife

Relevant targets in the 25 Year Environment Plan

- Meeting legally binding targets to reduce emissions of 5 damaging air pollutants
- Restoring 75% of our one million hectares of terrestrial and freshwater protected sites to favourable condition, securing their wildlife value for the long term

Position in the natural capital framework

Pressure on natural capital assets

Related reporting commitments

- International Collaborative Partnership reporting under United Nations Economic Commission for Europe's Working Group on Effects
- Convention on Biological Diversity Aichi Target 8

Geographical scope

England

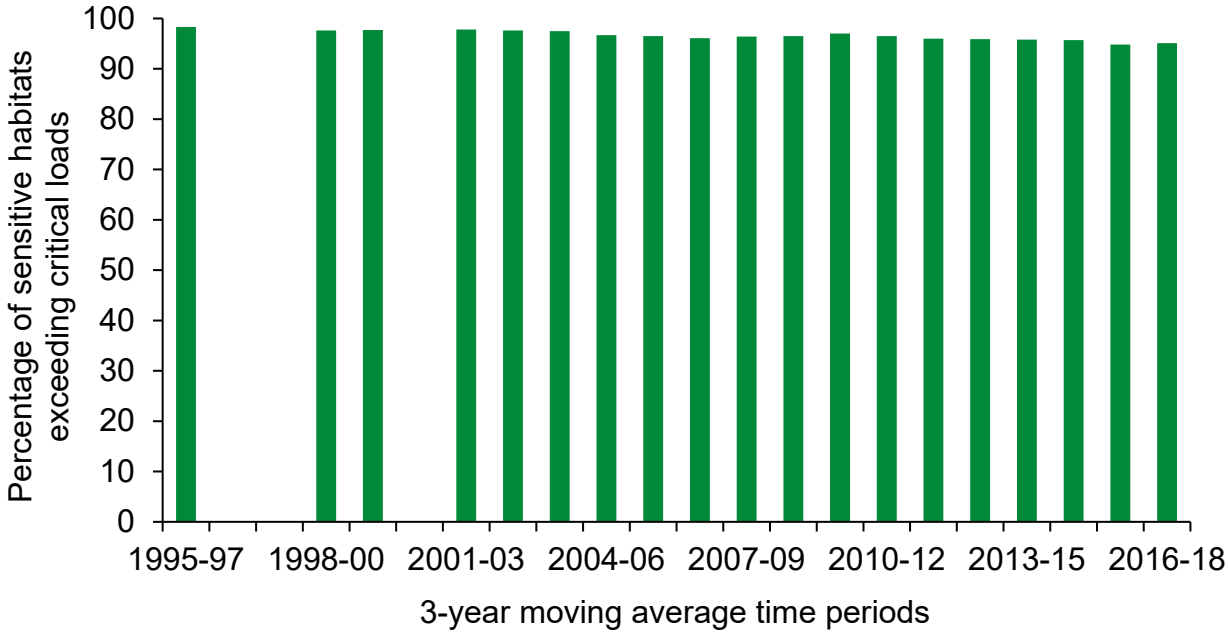
Status of indicator development

Final

Readiness and links to data

Assessments are undertaken and published annually using 3-year moving average data, at UK Air Information Resource: Trends in critical load and critical level exceedances in the UK.

Figure A6, Exceedance of damaging levels of nutrient nitrogen deposition in England, 1995-97 to 2016-18



Source, UK Centre for Ecology & Hydrology

Note

Data are presented as 3-year moving average time periods. There have been a number of minor methodological changes in 2001-03, 2002-04 and 2004-06 which should be taken into account when interpreting this trend. No data are available for the periods 1996-98, 1997-99 and 2000-02.

Trend description

The percentage area of sensitive habitats in England where nutrient nitrogen deposition exceeded critical load has fallen over the latest 20 years for which data are available (98.3% in 1995-97 to 95.1% in 2016-18).

A7 Area of land exposed to damaging levels of ammonia (NH3) in the atmosphere

Short description

This indicator tracks changes in land area affected by damaging levels of ammonia (NH_3) in the air. Excess deposition of NH_3 on natural ecosystems causes nutrient enrichment and changes in vegetation and soils. Agriculture is the main source of NH_3 emissions to the atmosphere.

This indicator is a measure of pressure on ecosystems from air pollution. It shows the percentage of land area where interpolated measurements of ground-level air exceed the lower critical level threshold for NH_3 of 1 µg/m^3.

Relevant goals in the 25 Year Environment Plan

- Clean air
- Thriving plants and wildlife

Relevant targets in the 25 Year Environment Plan

- Meeting legally binding targets to reduce emissions of 5 damaging air pollutants (including NH_3)
- Restoring 75% of our one million hectares of terrestrial and freshwater protected sites to favourable condition, securing their wildlife value for the long term

Position in the natural capital framework

Pressure on natural capital assets

Related reporting commitments

- United Nations Economic Commission for Europe National Emissions Ceiling Directive Art.9 and the Convention on Long-range Transboundary Air Pollution
- Convention on Biological Diversity Aichi Target 8

Geographical scope

England

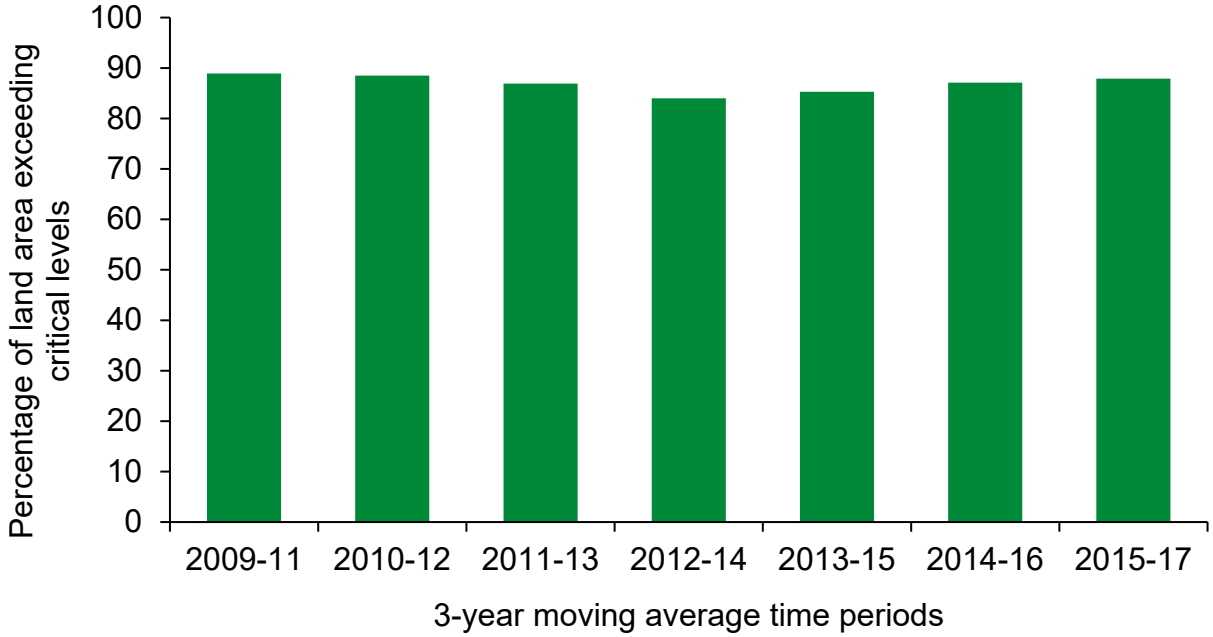
Status of indicator development

Final

Readiness and links to data

Assessments are undertaken and published annually using 3-year moving average data, at UK Air Information Resource: Trends in critical load and critical level exceedances in the UK.

Figure A7, Area of land in England exposed to damaging levels of ammonia (NH_3) in the atmosphere, 2009-11 to 2015-17



Source, UK Centre for Ecology & Hydrology

Note

Data are presented as 3-year moving average time periods.

Trend description

The percentage of land area exposed to concentrations of NH_3 that exceed critical levels (1 µg/m^3) has decreased slightly from 88.9% in 2009-11 to 87.9% in 2015-17.

Theme B: Water

B1 Pollution loads entering waters

Short description

This indicator will track changes in the inputs and discharges of selected contaminants such as nutrients and some toxic chemicals to rivers or directly to the sea, for example through sewage pipelines or activities such as agriculture inputting substances directly.

It will focus on the discharge/emission of contaminants that adversely affect the quality and uses of receiving waters and potentially increase the costs of water treatment. These also affect the wildlife and ecology of rivers, estuaries and coastal waters.

Data will be derived from the existing Riverine Input and Direct Discharges (RID) data collected under the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR) and the Environment Agency's Emissions Inventory.

Relevant goals in the 25 Year Environment Plan

- Clean and plentiful water
- Thriving plants and wildlife

Relevant targets in the 25 Year Environment Plan

- Improving at least three-quarters of our waters to be close to their natural state
- Reaching or exceeding objectives for rivers, lakes, coastal water and ground waters that are specially protected, whether for biodiversity or drinking water as per our River Basin Management Plans
- Restoring 75% of our one million hectares of terrestrial and freshwater protected sites to favourable condition, securing their wildlife value for the long term

Position in the natural capital framework

Pressure on natural capital assets

Related reporting commitments

- UK Marine Strategy Regulations
- Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)
- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017

Geographical scope

England; data for individual sites, water bodies and catchments are also available.

Status of indicator development

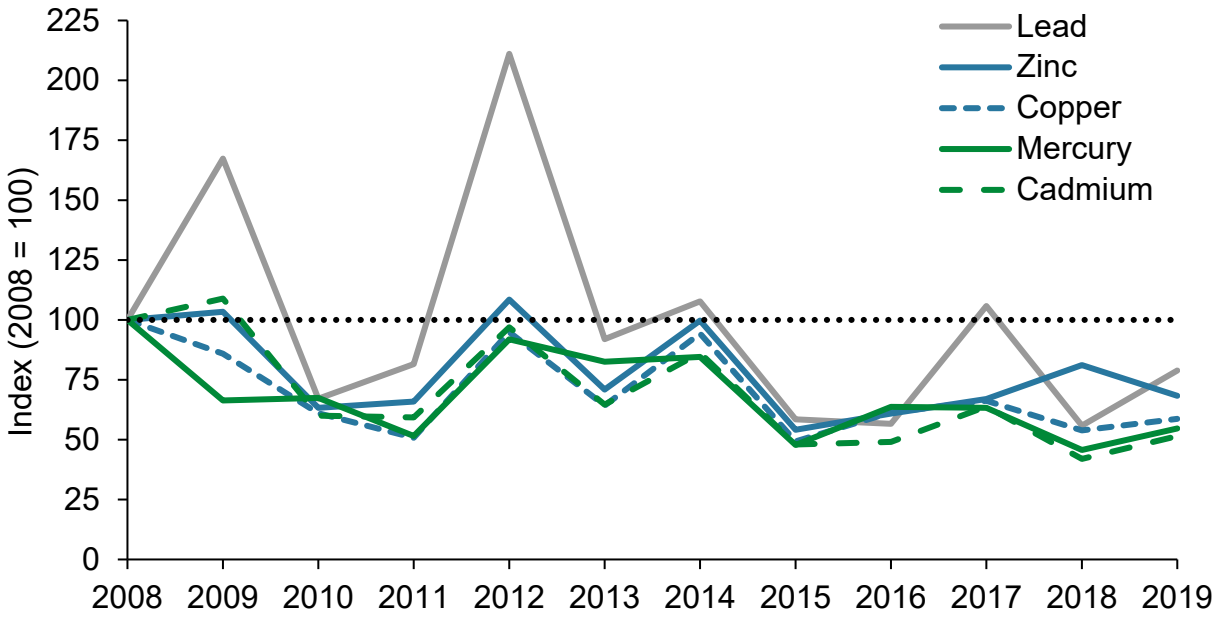
Interim

Readiness and links to data

This indicator is not available for reporting in 2021 in a finalised form. An interim indicator is presented here that shows relative changes in measured riverine loads (inputs) of selected metals and nutrients into English tidal waters between 2008 and 2019, covering cadmium, copper, lead, mercury, zinc, nitrogen and ortho-phosphate. Some data for this

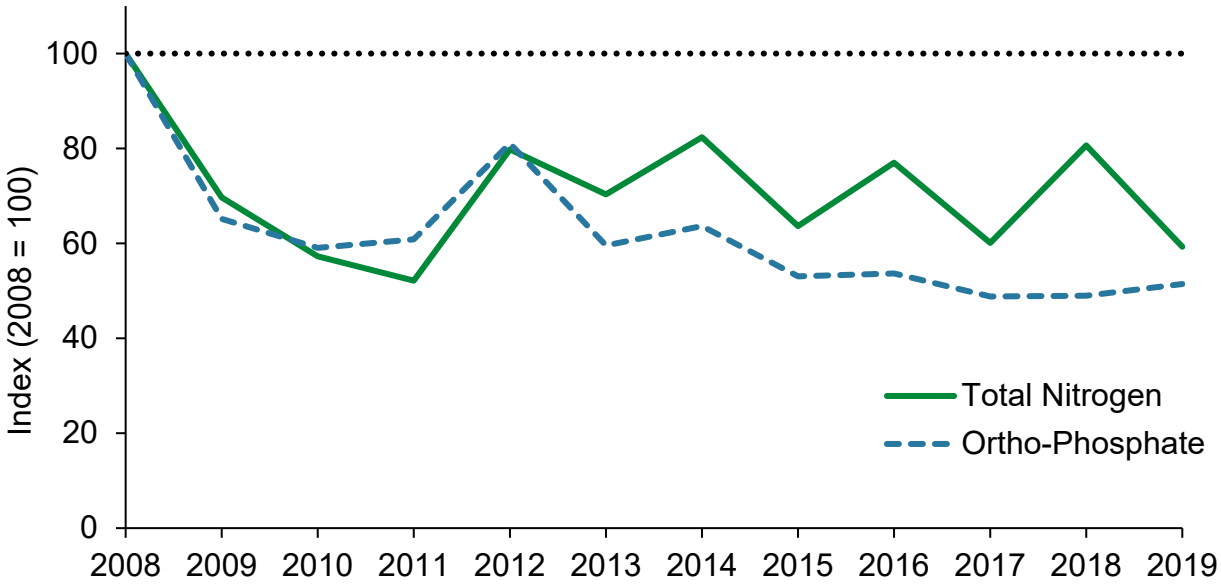
interim indicator have previously been published as part of the OSPAR assessments (Inputs of Mercury, Cadmium and Lead via Water and Air to the Greater North Sea) although for different time periods and so these data should be compared with caution. Further development is required to present statistical trends for the selected contaminants in an indicator. These data are taken from the existing OSPAR database. The Environment Agency reports a subset of these data to Defra on an annual basis known as the RIDS dataset, 'Riverine and Industrial Discharges' Contact the Environment Agency's National Customer Contact Centre (enquiries@environment-agency.gov.uk) for the OSPAR database extract used for the interim indicator.

Figure B1a (interim), Riverine inputs of selected metals into English tidal waters, 2008 to 2019



Source, Environment Agency

Figure B1b (interim), Riverine inputs of selected nutrients into English tidal waters, 2008 to 2019



Source, Environment Agency

Note

Load (input) calculations (kg/day) are the product of the monitored concentration of substance and flow rate. The annual total loads (kg/year) for selected metals (total fraction), total nitrogen and ortho-phosphate are calculated using chemical concentration data reported in the Water quality data Archive and flow data reported in the Environment Agency's core system of hydrometric and hydrological values (Water Information System by Kisters).

The interim indicator reports each annual load relative to the 2008 monitored load (2008 is represented as a baseline index = 100).

Data show the changing concentrations recorded between 2008 and 2019. Observed fluctuations in the data could be influenced by a number of external factors affecting movement and loading within river systems such as flow caused by high or low rainfall in a given year or local impacts of changing industry or land use over time. Also, flow and load in 2008 were high compared to most years in the reporting period which influence the reduction seen against 2019.

Trend description

a) Riverine inputs of selected metals

Riverine inputs of cadmium, copper, lead, mercury and zinc into English tidal waters have fluctuated considerably between 2008 and 2019, but overall they have all fallen.

Measured loads of cadmium, mercury, copper, zinc and lead were 49%, 45%, 41% 32% and 21% respectively less in 2019 than they were in 2008.

b) Riverine inputs of selected nutrients

Riverine inputs of total nitrogen and ortho-phosphate have also fluctuated considerably between 2008 and 2019 but overall, both have fallen, and both have remained below their baseline value with measured loads in 2019 being 41% and 49% respectively less than those measured in 2008.

B2 Serious pollution incidents to water

Short description

This indicator shows changes in the number of pollution incidents impacting on water health, including in rivers, lakes, reservoirs, canals, coasts, estuaries and groundwater. Serious pollution incidents are a pressure on the water environment. The Environment Agency uses 4 categories to determine the severity of pollution incidents. The indicator shows the number of events in each year that are in the 2 higher categories (category 1, major and category 2, significant), for example, causing death of fish, potential harm to bathers, or the temporary cessation of abstraction from a river by a drinking water provider.

Relevant goals in the 25 Year Environment Plan

- Clean and plentiful water
- Thriving plants and wildlife

Relevant target in the 25 Year Environment Plan

- No specific target

Position in the natural capital framework

Pressure on natural capital assets

Related reporting commitments

- Domestically under the Environment Act 1995
- Relevant under the UN’s Sustainable Development Goal 6

Geographical scope

England; data for individual incidents at any geographical scale are also available.

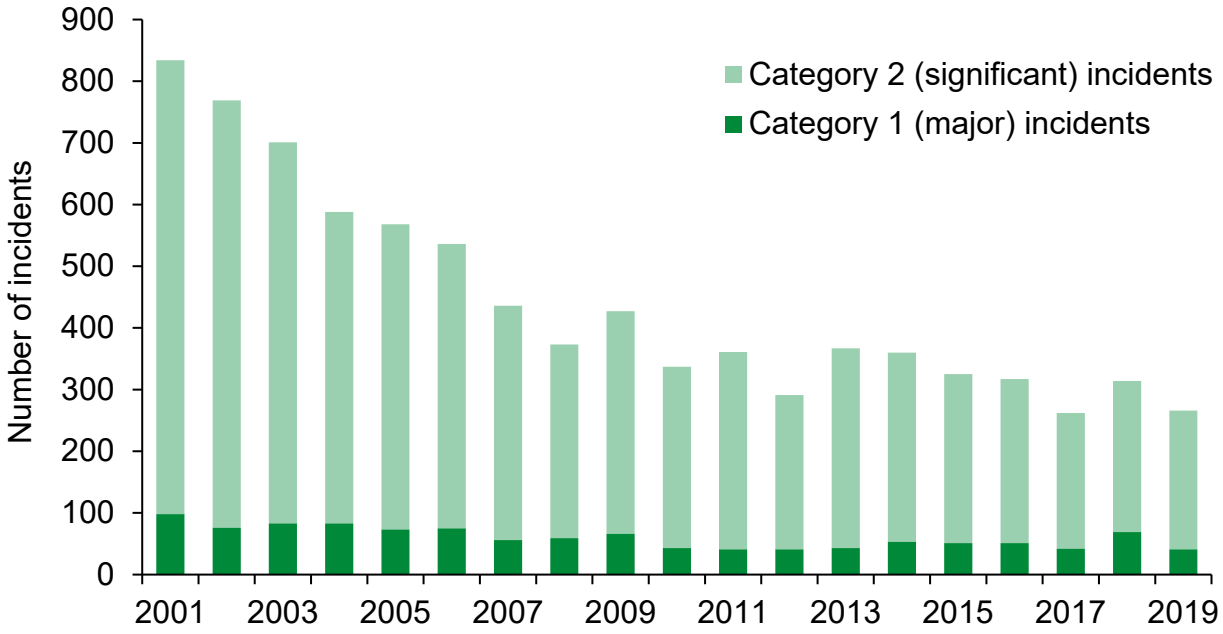
Status of indicator development

Final

Readiness and links to data

Data are already published annually by the Environment Agency: Pollution incidents data and in Section 5 of the Water and Sewerage Companies in England environmental performance report; longer-term trends are available in the State of the environment: water quality report and the Regulating for people, the environment and growth report.

Figure B2, Serious pollution incidents to water in England, 2001 to 2019



Source, Environment Agency

Note

Only includes incidents where investigations and response have been completed by the Environment Agency. Some incidents may take an extended period of months, or exceptionally years, to be completed.

The dataset only includes substantiated incidents and their environmental impact, that is where there is confirmation that the incident took place either by a visit from the Environment Agency or a partner organisation, or it is corroborated by other information.

Results do not include incidents relating to:

- Fisheries incidents – incidents involving illegal fishing and illegal fish movements, fish disease, fishery management activities and fish kills from non-pollution causes, including low flows and low dissolved oxygen

- Water Resources incidents – incidents involving the quantity of a water resource.
- Waterways incidents – incidents on a waterway where the Environment Agency are the competent authority for navigation
- Flood and Coastal Risk Management incidents – for incidents which involve actual or potential flooding and land drainage works

Trend description

The total number of serious pollution incidents to water in England has fallen from 427 in 2009 to 266 in 2019, a drop of 38%. Category 2 (significant) incidents decreased from 361 in 2009 to 225 in 2019; category 1 (major) incidents decreased from 66 to 41 over the same 10-year period.

B3 State of the water environment

Short description

This indicator takes a broad overview of the condition of the water environment; it relates to freshwater bodies, wetlands, groundwaters, estuaries and coastal waters. The indicator is composed of several metrics including: percentage of water tests meeting good (or better) Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (the WFD regulations) status for ecology and chemistry, percentage of water bodies achieving good ecological status, and compliance of waters specially protected for specific uses such as drinking water abstraction and nature conservation. Some of these data relating to protected sites are also included in ‘D2 Extent and condition of protected sites – land, water and sea’. All the Water theme indicators are linked, but 2 indicators that are important to consider as part of the wider state of the water environment are: ‘B4 Condition of bathing waters’ and ‘B6 Natural functions of water and wetland ecosystems’.

Relevant goals in the 25 Year Environment Plan

- Clean and plentiful water
- Thriving plants and wildlife

Relevant targets in the 25 Year Environment Plan

- Improving at least three-quarters of our waters to be close to their natural state
- Reaching or exceeding objectives for rivers, lakes, estuaries, coastal and ground waters that are specially protected, whether for biodiversity or drinking water as per the river basin management plans
- Restoring 75% of our one million hectares of terrestrial and freshwater protected sites to favourable condition, securing their wildlife value for the long term

Position in the natural capital framework

Condition of assets: freshwater, marine, species and ecological communities

Related reporting commitments

- Water Environment (Water Framework Directive) (England and Wales) Regulations 2017
- Reporting under the Conservation of Habitats and Species Regulations 2017 (as amended) for water dependent sites
- Reporting under the Marine Strategy Regulations 2010 and the assessment of Good Environmental Status in Regional Seas
- Reporting under the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR) convention 1992 and associated Annexes
- May provide evidence in support of Climate Change Risk Assessment under the Climate Change Act (2008)
- Relevant to the Sustainable Development Goal 6.3.2 – Proportion of bodies of water with good ambient water quality

Geographical scope

England; data at site, water body, catchment and river basin district level are also available.

Status of indicator development

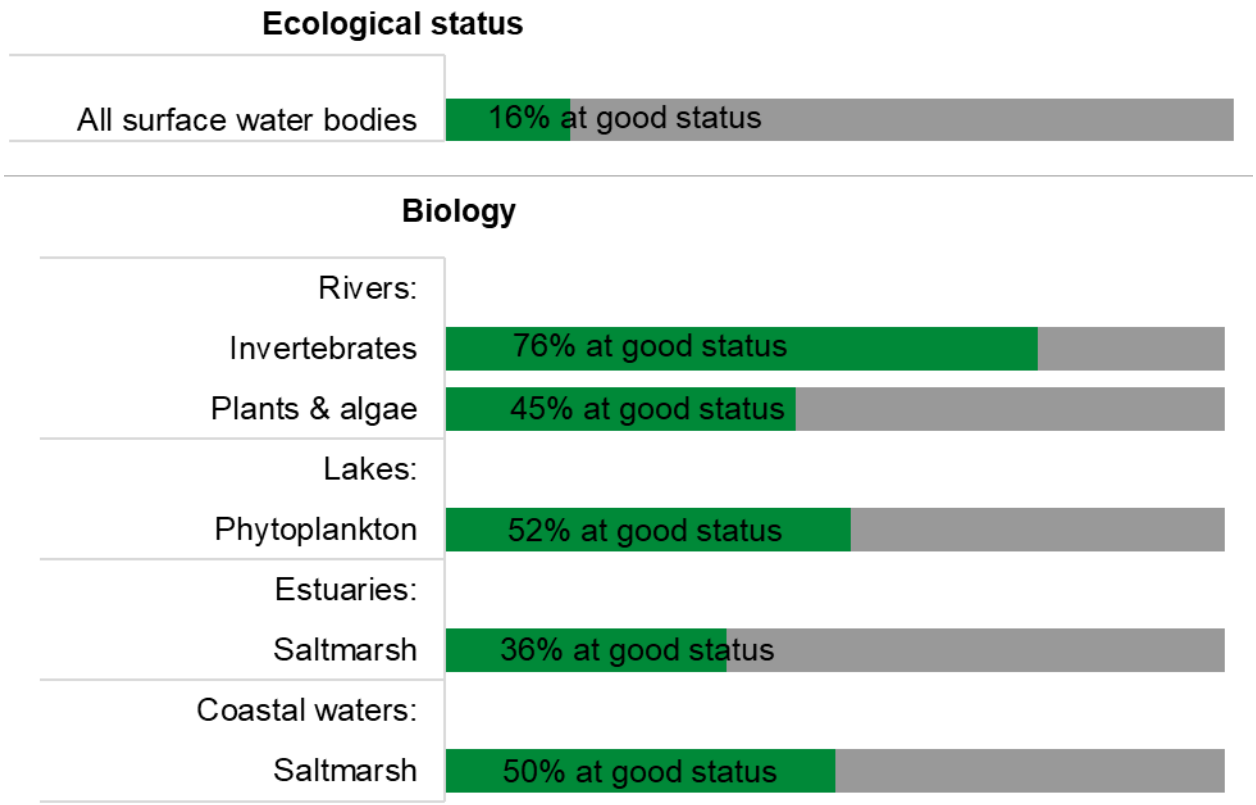
Interim

Readiness and links to data

This indicator is not available for reporting in 2021 in a finalised form. A revised interim indicator is presented here as an Experimental Statistic. This expands on previous reporting to show data across the water environment. It includes metrics from the WFD Regulations status tests for (a) surface water bodies (rivers, lakes, estuaries and coastal waters); (b) groundwaters; and (c) waters protected for a specific reason such as drinking waters and nature sites. For each water type, we include a representative element that is tested to assess the condition of a water body; reflecting water quality and/or hydromorphology. There are many more elements assessed and tests undertaken; this represents a snapshot of the complete WFD Regulations dataset. Supporting detail for each of the water types and a more detailed dashboard of data are available in the Evidence Pack. These data are being published as an Experimental Statistic in order to facilitate user involvement in the development of this indicator. We would therefore welcome any feedback on these statistics, particularly on their usefulness and value, via 25YEPindicators@defra.gov.uk. Further work is required to develop the indicator which may, for example, show change over time. We will work with partners continue to develop

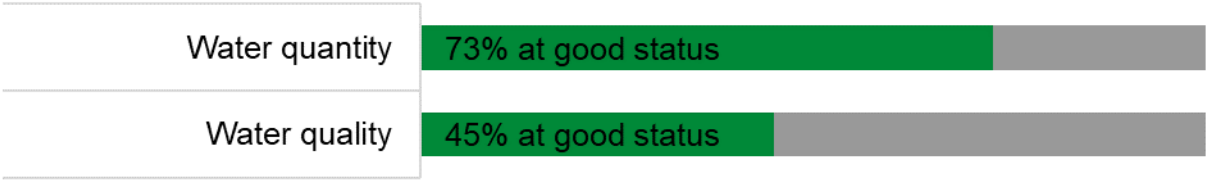
our approach for future reporting. Source data are currently published (WFD element status; protected area data; State of the environment: water quality report).

Figure B3a (interim), Status of surface waters in England, 2019



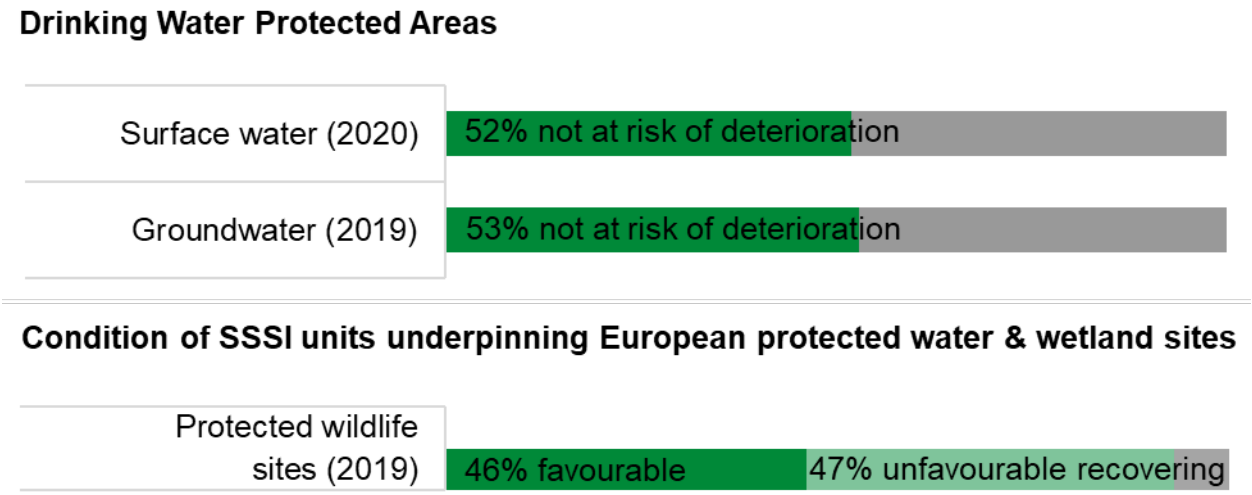
Source, Environment Agency

Figure B3b (interim), Status of groundwaters in England, 2019



Source, Environment Agency

Figure B3c (interim), Status of waters specially protected for specific uses in England, 2019/2020



Source, Status of Drinking Water Protected Areas, Environment Agency; Condition of SSSI units underpinning European protected water & wetland sites, Natural England

Note

For B3a and B3b, results for the status of all surface waters and groundwaters are based on the numbers of water bodies assessed and represent the achievement of good or better status. Ecological status is assigned using various water, habitat and biological quality tests. Failure of any one individual test means that the whole water body fails to achieve good or better ecological status (the “one out all out” rule).

The B3c indicator for nature conservation includes all water-dependent (river, lake, small waterbody, coastal and wetland) SSSI units underpinning European sites, results are by area. Adverse condition reasons and threats unrelated to Water Framework Directive (water quality, water resources, physical modification) drivers are excluded from the analysis. The European sites series includes Special Areas of Conservation and Special Protection Areas (SPAs). SPAs are designated for bird features only, where favourable condition may not include assessment of water quality elements.

Trend description

a) For surface waters (including rivers, lakes, estuaries and coasts)

16% of surface water bodies met the “one out all out” criteria of the WFD Regulations in 2019. For rivers, invertebrates and the combined test for macrophytes and phytobenthos (plants and algae) are reported to indicate biological quality, where 76% and 45% of tests carried out passed for the water bodies assessed respectively. For lakes, the representative biological element shown is phytoplankton with 52% of water bodies assessed passing. Saltmarsh is shown for estuaries and coasts and reflects the extent of habitat and show 36% and 50% of water bodies monitored, pass the test respectively.

b) Groundwaters

75% passing quantitative tests and 45% pass chemical (qualitative) tests.

c) Sites specially protected for specific uses such as drinking water abstraction and nature conservation.

52% of surface water areas and 53% of groundwater drinking water protected areas are not at risk of deterioration. For protected nature sites, 46% are at favourable condition and 47% are in an unfavourable but recovering condition.

B4 Condition of bathing waters

Short description

This indicator assesses the condition of bathing waters. It shows the percentage of designated bathing waters meeting conditions sufficient to minimise the risk of harm to bathers from faecal pollution. It is based on a set of microbiological tests (measuring *E.coli* and intestinal enterococci) performed on waters used for bathing. The bacteria, if present, can cause severe stomach upsets and gastro-intestinal illness. Bathing waters are mainly coastal beaches but also include a number of inland freshwater lakes and an area on a river.

Relevant goal in the 25 Year Environment Plan

- Clean and plentiful water

Relevant target in the 25 Year Environment Plan

- Minimising by 2030 the harmful bacteria in our designated bathing waters and continuing to improve the cleanliness of our waters

Position in the natural capital framework

Condition of assets – marine; freshwater

Related reporting commitments

- Statutory duty under the Bathing Water Regulations (2013) to report condition

Geographical scope

England; data for individual designated bathing waters are also available.

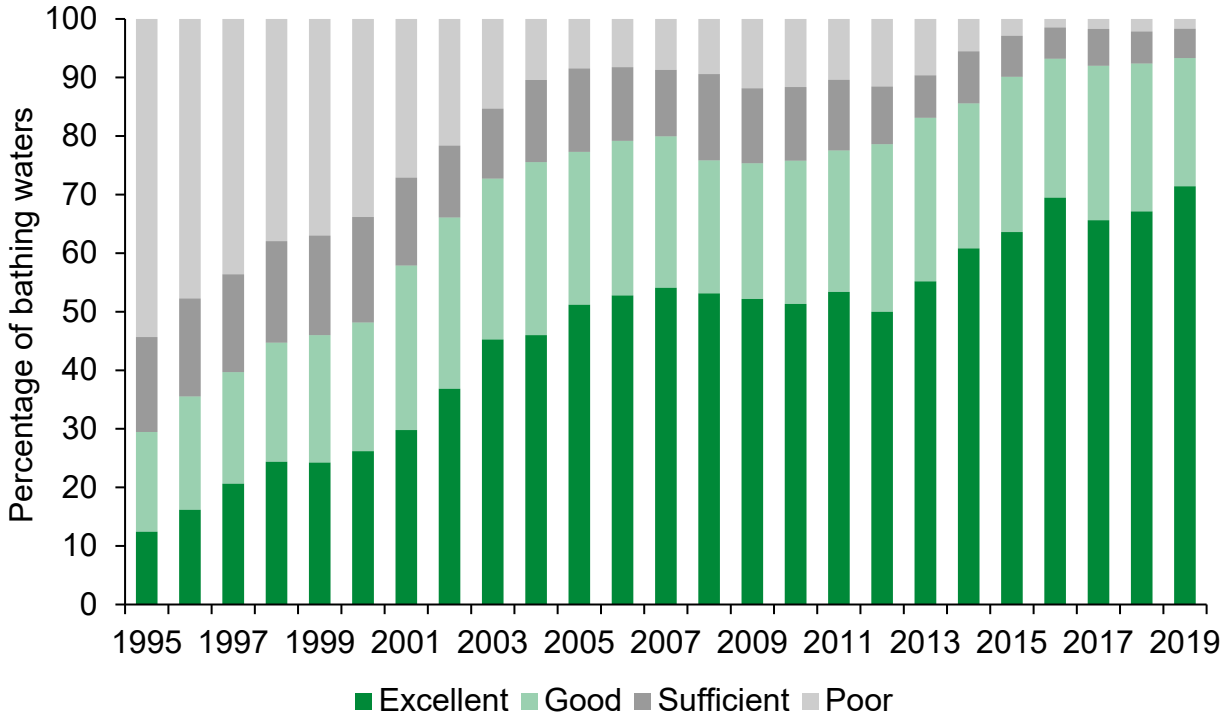
Status of indicator development

Final

Readiness and links to data

Data on Bathing water quality statistics are already published annually; longer-term trends are available in the State of the environment: water quality report. Due to the impact of COVID-19 there are no new data reported in 2021.

Figure B4, Condition of bathing waters in England, 1995 to 2019



Source, Environment Agency

Note

As reported by the Official statistics announcement for Bathing Water quality statistics England (2020) an official statistic has not been produced for 2020 and this indicator cannot be updated. This is due to the severe impacts on bathing water monitoring and analysis caused by the coronavirus pandemic and the necessary adherence with government guidelines to prevent the spread of the virus.

Trend description

The number of designated bathing waters in England meeting at least the minimum standard (sufficient, good or excellent) has increased considerably from 45.7% in 1995 to 98.3% in 2019; it has remained relatively stable over the last 4 years at between 97.8% and 98.5%. The number of bathing waters achieving excellent status has also increased

considerably since 1995, with 71.4% meeting this standard in 2019. The number of bathing waters rated as poor has remained below 3% since 2015.

B5 Water bodies achieving sustainable abstraction criteria

Short description

This indicator shows changes in the percentage of surface waters (rivers, lakes, reservoirs and estuaries) and groundwater (including wetlands fed by groundwater) where sustainable abstraction criteria are met. River flows and groundwater levels are sustainable when they support ecology that is only slightly impacted by human activity. The indicator is affected by changes in water use, both in relation to leakage and personal consumption (see E8 Efficient use of water). This indicator is also sensitive to effects of future climate change on rainfall and consumption and shows the need for adaptation.

Relevant goals in the 25 Year Environment Plan

- Clean and plentiful water
- Thriving plants and wildlife

Relevant targets in the 25 Year Environment Plan

- Reducing the damaging abstraction of water from rivers and groundwater, ensuring that by 2021 the proportion of water bodies with enough water to support environmental standards increases from 82% to 90% for surface water bodies and from 72% to 77% for groundwater bodies
- Restoring 75% of our one million hectares of terrestrial and freshwater protected sites to favourable condition, securing their wildlife value for the long term

Position in the natural capital framework

Condition of asset – freshwater

Related reporting commitments

- Water Environment (Water Framework Directive) (England and Wales) Regulations 2017
- Relevant to Sustainable Development Goal 6.4.2
- May support Climate Change Risk Assessment and the Adaptation Sub-Committee's assessment of the National Adaptation Programme, under the Climate Change Act (2008)

Geographical scope

England; data for individual water bodies are also available.

Status of indicator development

Final

Readiness and links to data

Data on WFD Cycle 2 site classifications are published as part of the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 and the Abstraction Reform Report 2019.

Note

A graph is not yet presented for this indicator as data are currently only available for 3 years.

Trend description

In 2019, 85% of surface water bodies supported required flow standards and 73% of groundwater bodies were sustainable. Both of these results represent a one percentage point increase from the equivalent figures reported in 2018. In 2017, when the timeseries began, 82% of surface water bodies supported required flow standards and 72% of groundwater bodies were sustainable.

B6 Natural functions of water and wetland ecosystems

Short description

This indicator will track changes in the naturalness of ecosystem functioning across water and wetland ecosystems in England (including rivers, headwater streams, wetlands, lakes and ponds). Restoring natural functions to these ecosystems is essential for biodiversity recovery and resilience to climate change, and contributes to enhancing ecosystem services such as the provision of clean water and flood regulation. Indicator B6 is closely linked with indicator D1 on the extent, quality and connectivity of habitats as the naturalness of ecosystem function is also being considered within D1. It is anticipated that the development work on D1 and B6 will address different habitat components that are shared between the 2 indicators; B6 work will provide the freshwater habitat component and D1 will provide the wetland component.

This indicator will help track improvements to the naturalness of underlying ecosystem functions in aquatic and wetland ecosystems. It will use data from a range of sources. Further development of methods and monitoring/evaluation frameworks will be needed to apply this approach to the full range of water and wetland habitat types and to explore new methods including Earth Observation.

Relevant goals in the 25 Year Environment Plan

- Thriving plants and wildlife
- Clean and plentiful water
- Enhancing biosecurity

Relevant targets in the 25 Year Environment Plan

- Creating or restoring 500,000 hectares of wildlife-rich habitat outside the protected site network, focusing on priority habitats as part of a wider set of land management changes providing extensive benefits
- Achieve clean and plentiful water by improving at least three-quarters of our waters to be close to their natural state as soon as is practicable
- Restoring 75% of our one million hectares of terrestrial and freshwater protected sites to favourable condition, securing their wildlife value for the long term
- Reaching or exceeding objectives for rivers, lakes, coastal and ground waters that are specially protected, whether for biodiversity or drinking water as per our River Basin Management Plans

Position in the natural capital framework

Condition of assets – freshwater, species and ecological communities

Related reporting commitments

- Conservation of Habitats and Species Regulations 2017 (as amended)
- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017
- Domestic targets under England Biodiversity Strategy 2020

Geographical scope

England. Some elements of the indicator will also be able to provide reliable sub-national assessment. National assessments of individual river and lake habitat types included in priority habitat definitions (for example, chalk rivers, oligotrophic lakes) will also be possible.

Status of indicator development

In development

Readiness and links to data

This indicator is not available for reporting in 2021. Substantial progress has continued to be made since 2020, building on the foundation provided by Natural England Report JP016, on determining attributes for rivers and streams, developing a draft framework for high-level reporting of the indicator, designing a working model of the rivers' component and rationalising the broad relationship with Outcome Indicator D1 'Quantity, quality and

connectivity of habitats'. New monitoring frameworks are being designed to provide data for the B6 indicator, particularly in respect of headwater streams and smaller lakes. Further development in 2021 will focus on the lakes and ponds components and refining the overarching model for the indicator.

B7 Health of freshwaters assessed through fish populations

Short description

This indicator tracks changes in populations of native freshwater fish in England. Fish are a good indicator of healthy freshwater environments, responding to changes in water quality (including temperature) and quantity, as well as the quality of river habitats, necessary to sustain healthy juvenile populations and enable migration throughout the rivers to complete their life cycles. Fish also provide an important recreational and economic benefit from freshwaters.

Relevant goals in the 25 Year Environment Plan

- Thriving plants and wildlife
- Clean and plentiful water

Relevant targets in the 25 Year Environment Plan

- Taking action to recover threatened, iconic or economically important species of animals, plants and fungi, and where possible to prevent human induced extinction or loss of known threatened species in England and the Overseas Territories
- Restoring 75% of our one million hectares of terrestrial and freshwater protected sites to favourable condition, securing their wildlife value for the long term

Position in the natural capital framework

Condition of assets – freshwater; species and ecological communities

Related reporting commitments

- Aligns with assessment of fish populations in rivers as undertaken and reported through our obligations to the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017
- Assessment of salmon stocks is reported separately to the International Council for the Exploration of the Seas and the North Atlantic Salmon Conservation Organisation
- Relevant to Convention on Biological Diversity Aichi Target 6

Geographical scope

England; data for river basin district are also available.

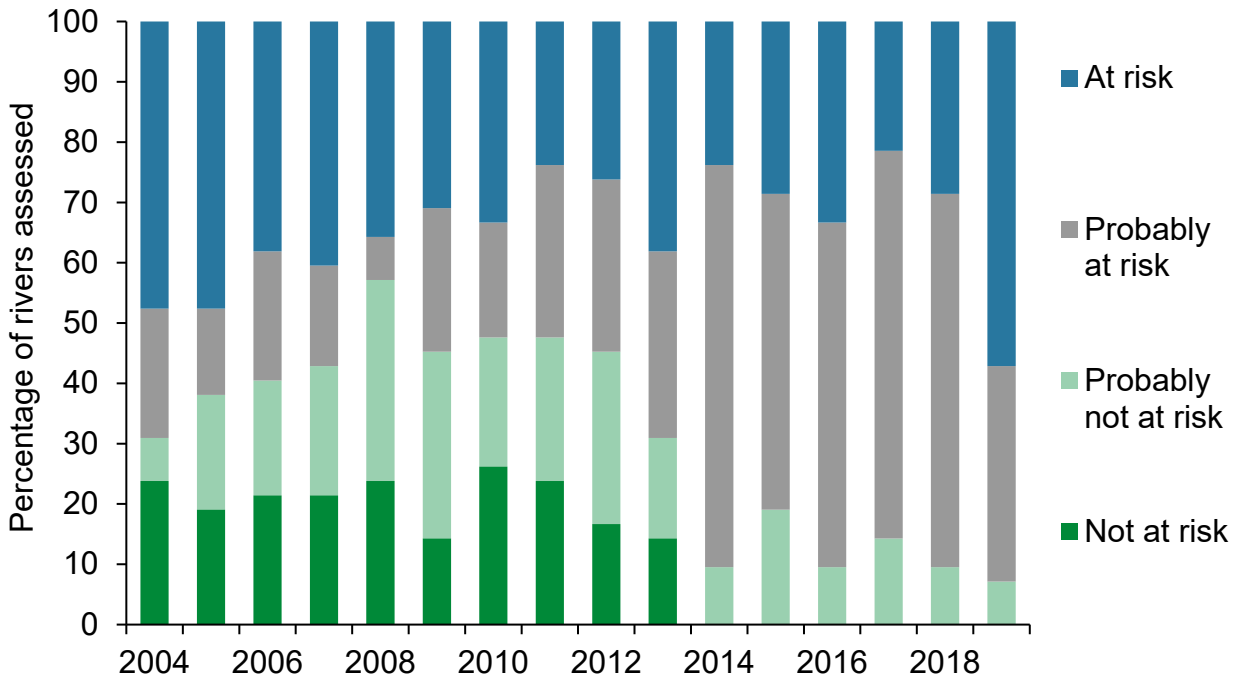
Status of indicator development

Interim

Readiness and links to data

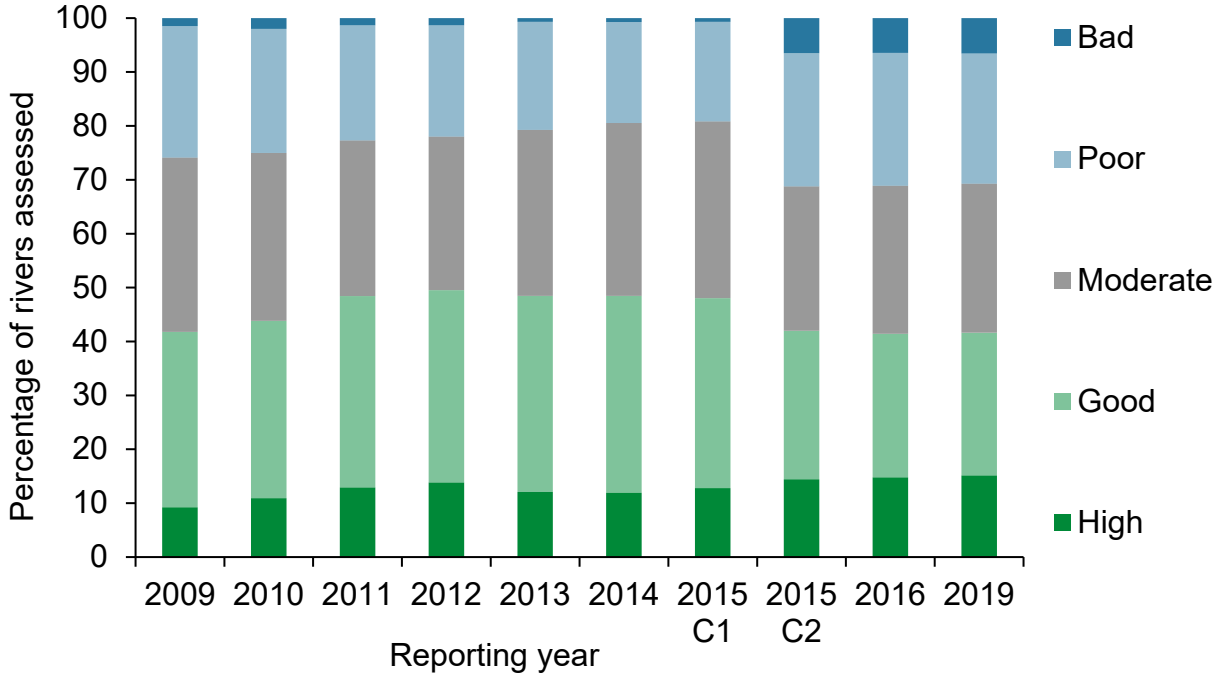
This indicator is not available for reporting in 2021 in a finalised form. An updated interim indicator is presented here that expands on previous reporting to show (a) the proportion of principal salmon rivers at risk in England and, additionally, (b) the classification of fish species within English rivers. B7a shows annually published national salmon stock data. For this assessment, each river's salmon stocks are placed into one of 4 categories: at risk; probably at risk; probably not at risk; and not at risk. The results act as a proxy for whether a particular river is at risk or not. In addition, a second measure of freshwater health has been included for the first time in 2021. Fish classification data for B7b reflect the status of fish species within rivers assessed in England. The results act as a proxy for whether the status of a particular river is: high; good; moderate; poor or bad. Further work will examine the coverage of the indicator.

Figure B7a (interim), Salmon stock status – principal salmon rivers at risk in England, 2004 to 2019



Source, Environment Agency

Figure B7b (interim), Classification of fish in English rivers, 2009 to 2019



Source, Environment Agency

Note

There are 2 data points shown for the classification of fish in English rivers in 2015; these represent a change in assessment methods and a move from Cycle 1 to cycle 2 of the Water Framework Directive reporting units. Reporting on fish classifications also moved from annual to triennial in 2016, so the next reporting point was 2019.

Trend description

a) Salmon stock status

The percentage of principal salmon rivers at risk in England has risen by 10 percentage points, from 48% in 2004 to 58% in 2019; the percentage of rivers in the 'probably at risk' category has increased by 15 percentage points, from 21% to 36% over the same time period. The percentage of rivers in the 'not at risk' category has fallen by 24 percentage points to zero between 2004 and 2019, and while the percentage of rivers that are probably not at risk has fluctuated in the intervening years, it is the same in 2019 as it was in 2004.

b) Classification of fish

The data show a slight but consistent increase in the numbers of rivers classed as high and good ecological status for fish between 2009 and 2015 and a corresponding small decrease in numbers of rivers in the poor and bad categories. Indications are that there was no change in the proportions of rivers in the 5 different categories between 2016 and 2019.

Theme C: Seas and estuaries

C1 Clean seas: marine litter

Short description

This indicator of clean seas shows changes in the amount of litter in the marine environment, including litter on beaches, on the seafloor and floating litter. Beach litter surveys are completed annually or quarterly and cover a representative number of beaches. Data from trawl surveys, typically carried out for fish stock assessments, are used to monitor the amount of litter on the seafloor. After each tow all litter items are emptied from the net and counted and classified. Beached fulmars or individuals accidently killed are collected as part of a monitoring programme in the Greater North Sea to assess the plastics found in their stomachs. Fulmars forage exclusively at sea, generally at the surface of the water. The amount of plastic they ingest can be used as a proxy for the abundance of floating litter in their environment and how this is changing. Indicators for seafloor litter, beach litter and litter found in Fulmar stomachs have been developed and expert groups are working to improve the data. Additional monitoring programmes are being developed to record the amount of microplastics in sediment and in biota.

Relevant goal in the 25 Year Environment Plan

- Minimising waste

Relevant target in the 25 Year Environment Plan

- Significantly reducing and where possible preventing all kinds of marine plastic pollution – in particular material that came originally from land

Position in the natural capital framework

Pressure on natural capital assets

Related reporting commitments

- UK Marine Strategy (Marine Strategy Regulations 2010)
- Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)
- Relevant to Sustainable Development Goal 14

Geographical scope

UK (Celtic Seas and Greater North Sea)

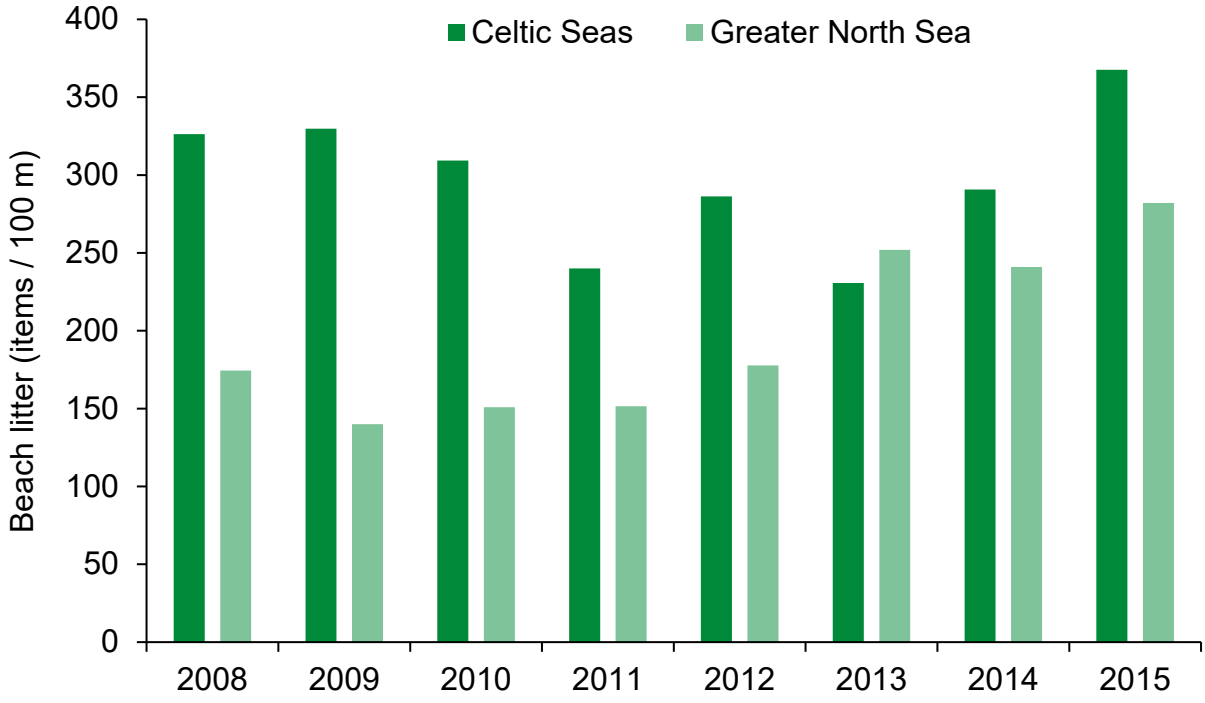
Status of indicator development

Interim

Readiness and links to data

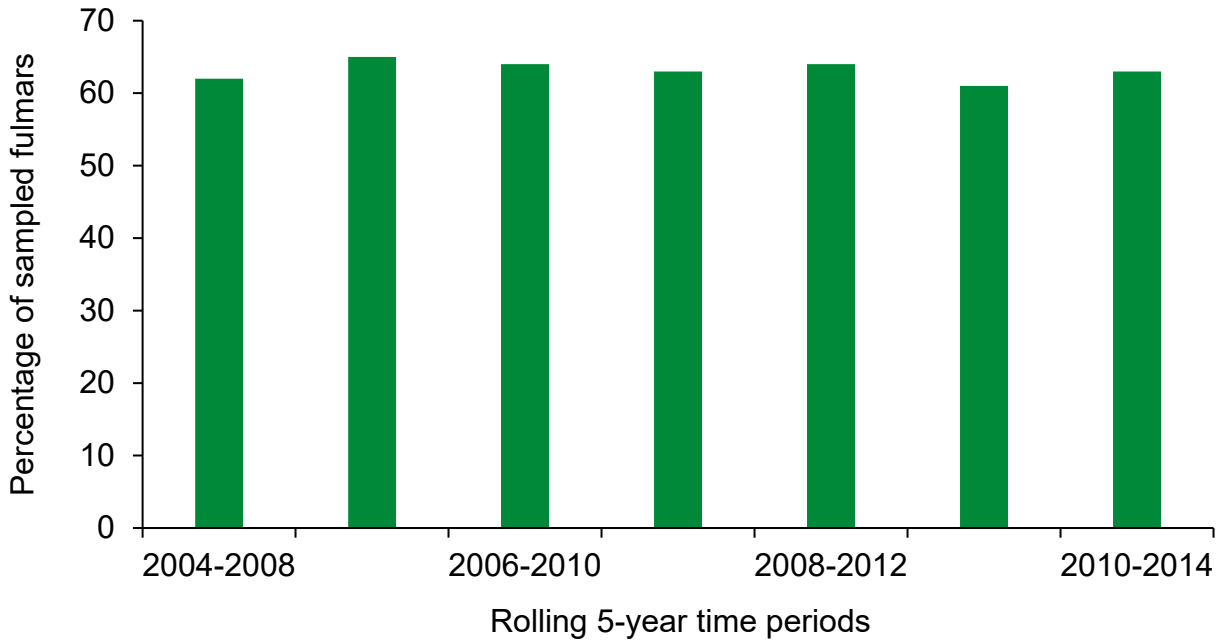
This indicator is not available for reporting in 2021 in a finalised form. An interim indicator is presented here that shows aspects of litter in the marine in environment. The assessments used for this interim indicator have been reported under the updated UK Marine Strategy Part One (2019). Data, analytical methods and assessment on Marine litter are available. Further methodological development of this indicator is required and the indicator's format will evolve.

Figure C1a (interim), Items of litter per 100 m of beach, UK, 2008 to 2015



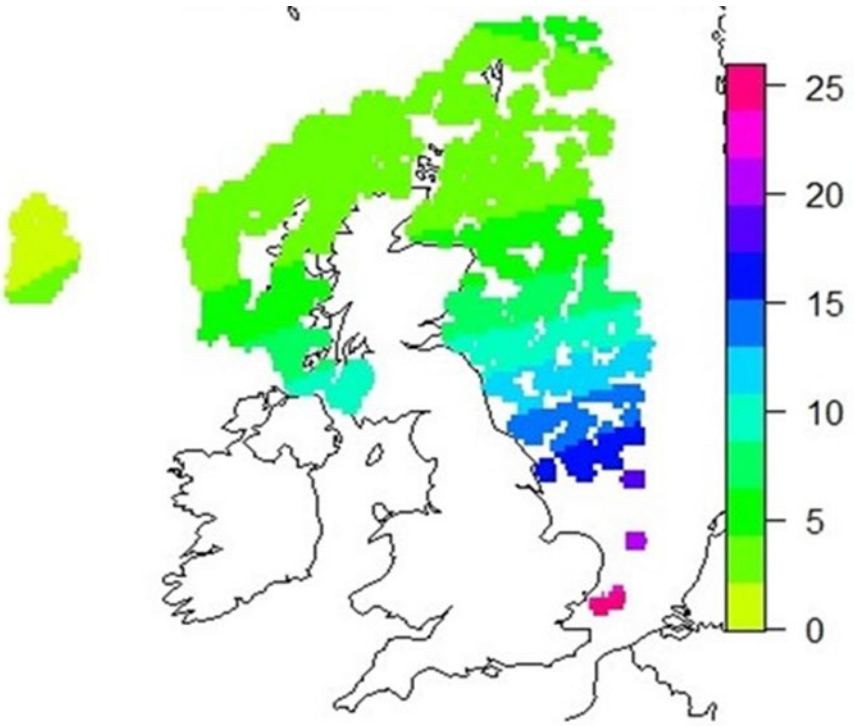
Source, Centre for Environment, Fisheries & Aquaculture Science

Figure C1b (interim), Percentage of sampled fulmars having more than 0.1 g of plastic in their stomach, UK, 2004-2008 to 2010-2014



Source, Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)

Figure C1c (interim), Smoothed median total of seafloor litter items per km^2, UK, 2012 to 2015



Source, Centre for Environment, Fisheries & Aquaculture Science

Note

Data on fulmars are presented as 5-year rolling time periods. Trends in UK seafloor litter are represented by spatially smoothed predictions of the median total number of pieces of litter per km, at a grid of points. The colours represent differing relative medians. This is using data combined over the years, although similar patterns are present in the data for the individual years. More data are required to make a full assessment of the trend in the amount of seafloor litter in specific areas of UK waters.

While the currently available data predate the 25 Year Environment Plan, they provide the most recently available assessment of marine litter. They enable a better understanding of a baseline from which to measure progress towards the goals of the 25 Year Environment Plan when the indicator is next updated.

Trend description

a) Beach litter

The average total abundance of beach litter items per 100 m of coast varies considerably around the UK with greater quantities being recorded in the Celtic Seas than the Greater North Sea. After showing some decrease from 2011 to 2013, beach litter levels in the Celtic Seas whilst fluctuating have risen to greater than the 2008 levels. In the Greater North Sea there has been an increase in beach litter levels. Water currents, weather conditions, and prevailing wind conditions can have an influence on the deposition and retention of beach litter and therefore beach litter abundance.

b) Fulmars

From 2004 to 2014 approximately 60% of surveyed fulmars were found to have more than 0.1 g of plastic found in their stomachs. This reflects the abundance of floating litter in their environment.

c) Seafloor litter

From sampling UK seafloor litter to date higher amounts of litter and plastic have been found per km^2 of seafloor in the Greater North Sea compared to the Celtic Seas. There were also higher amounts of seafloor litter in the southern parts of the Greater North Sea and Celtic Seas, which could be a result of increasing human pressures.

C2 Seabed subject to high pressure from human activity

Short description

This indicator tracks changes in the distribution and intensity of potential physical disturbance caused by human activities on the seabed. The indicator combines data on the intensity and distribution of pressures from human activities with data on the

distribution and sensitivity of seabed habitats. Data from vessel monitoring systems (VMS) showing fishing activity are linked to vessel logbook information and processed to create a layer showing abrasion pressure on the seabed. A second layer is produced by combining data on distribution of seabed habitats with information on resilience and resistance to evaluate their sensitivity to the pressure. The pressure and sensitivity layers are combined using a spatial method to create a single data layer showing the area of seabed subject to high disturbance from human activity. This indicator is linked to the "Extent of Physical Damage to Predominant and Special Habitats" indicator, developed for the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR) and used for the UK Marine Strategy Part One (2019) assessment of Good Environmental Status (GES).

Relevant goal in the 25 Year Environment Plan

- Thriving plants and wildlife

Relevant target in the 25 Year Environment Plan

- Ensuring seafloor habitats are productive and sufficiently extensive to support healthy, sustainable ecosystems

Position in the natural capital framework

Pressure on natural capital assets

Related reporting commitments

- UK Marine Strategy (Marine Strategy Regulations 2010)
- Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)
- Relevant to Sustainable Development Goal 14

Geographical scope

UK Continental Shelf

Status of indicator development

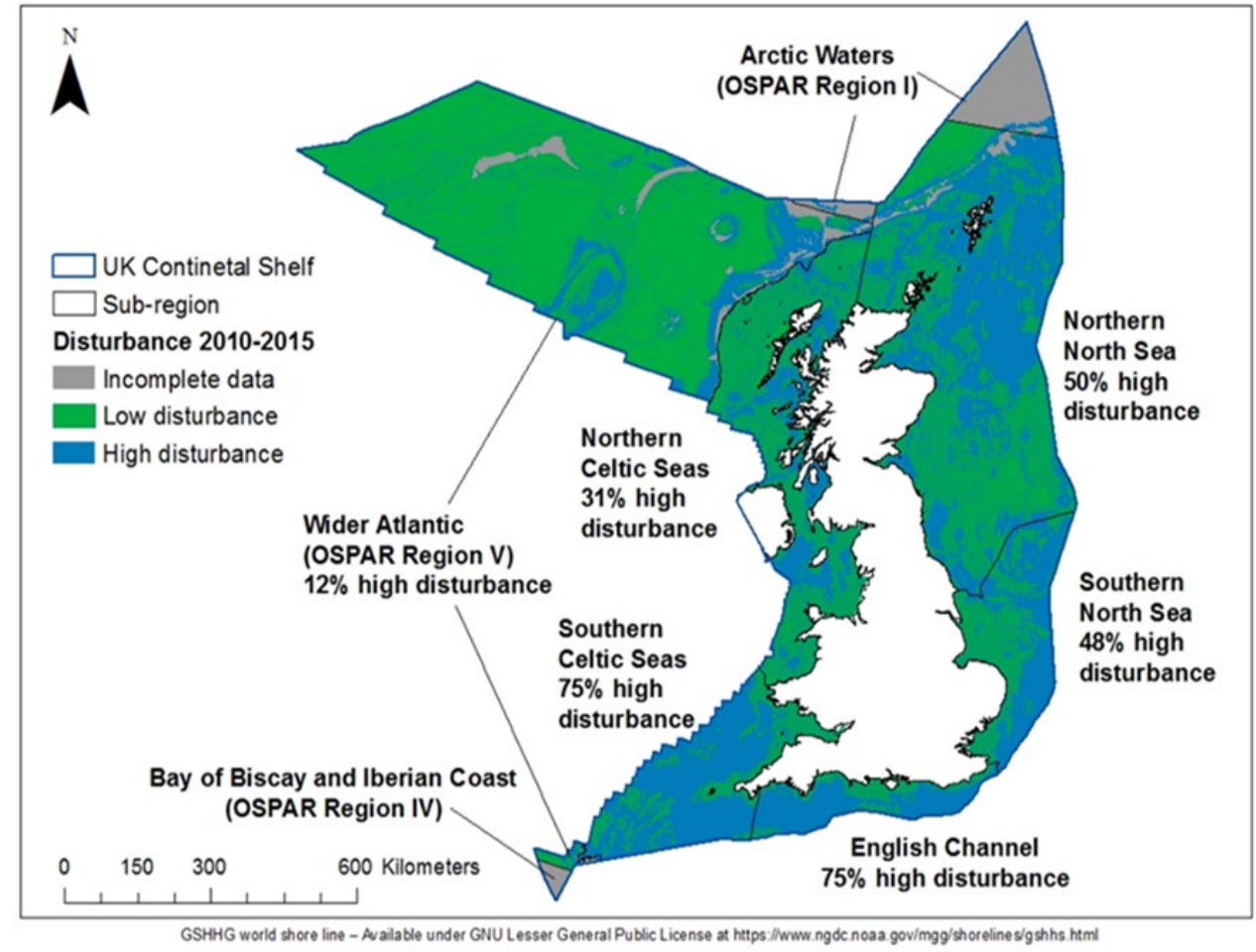
Interim

Readiness and links to data

This indicator is not available for reporting in 2021 in a finalised form as some changes to the method are needed to include additional activities and improve habitat sensitivity assessment. An interim indicator is presented here that shows the predicted area of seabed in the UK Continental Shelf exposed to disturbance from bottom contact fishing by vessels over 12 m long. The assessments used for this interim indicator, including data

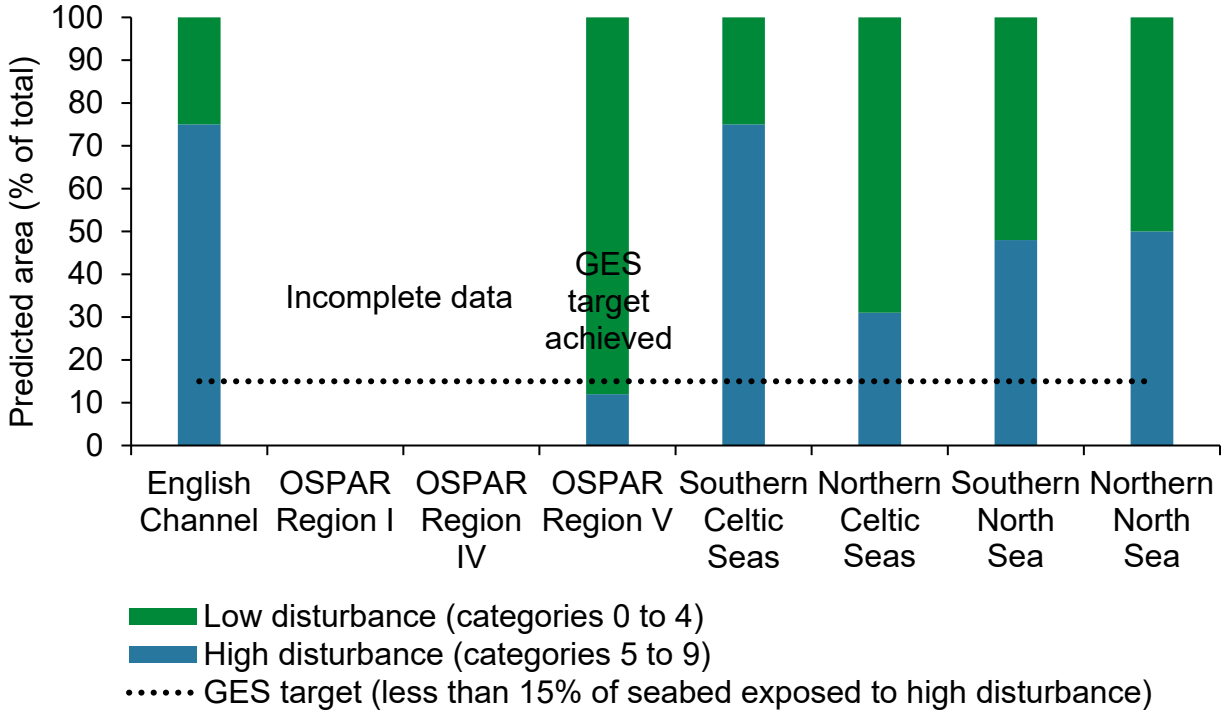
and analytical methods, have been reported under the updated UK Marine Strategy Part One (2019). Inclusion of other human activities, including small fishing vessels without VMS, and improved sensitivity information are in development and will be available as part of the OSPAR Quality Status Report in 2023.

Figure C2i (interim), Predicted area of seabed in the UK Continental Shelf exposed to disturbance from bottom contact fishing vessels over 12 m long, 2010 to 2015



Source, Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)

Figure C2ii (interim), Predicated area of seabed in the UK Continental Shelf exposed to disturbance from bottom contact fishing by vessels over 12 m long and regional progress towards Good Environmental Status (GES) 2010 to 2015



Source, Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)

Note

The degree of disturbance of a habitat is an index based on the predicted spatial and temporal overlap of its sensitivity and exposure to a specific pressure. Sensitivity is assessed using the distribution of habitats and information on species presence collected across the reporting cycle (2010 to 2015). The annual values of the distribution and intensity of pressure are aggregated to give an average pressure intensity for reporting cycle. If the pressure intensity is highly variable across the 6-year period in an area the highest value is taken. Sensitivity and pressure are combined via a matrix, producing 10 categories of disturbance ranging from 0 (no disturbance) to 9 (greatest disturbance possible). Plots show percentage area of OSPAR sub-regions in disturbance categories 0 to 4 (no or low disturbance) and 5 to 9 (high disturbance) across the reporting cycle (2010 to 2015). Incomplete data made it difficult to assess disturbance in the Bay of Biscay and Iberian Coast (OSPAR Region IV) and in Arctic Waters (OSPAR Region I).

While the currently available data predate the 25 Year Environment Plan, they provide the most recently available assessment of the physical damage to benthic habitats. They enable a better understanding of a baseline from which to measure progress towards the goals of the 25 Year Environment Plan when the indicator is next updated.

A lack of data relating to the activities of smaller fishing vessels (less than 12 m) exists as they are not equipped with a VMS recorder. Consequently, there is an underestimate of disturbance in inshore waters. Due to the analytical methods used there is a potential overestimate of disturbance as a consequence of assuming an even distribution of fishing pressures.

Trend description

There is currently no trend assessment due to the indicator not being considered previously. Changes over time might be identified by comparing results from multiple reporting cycle assessments such those produced by the UK Marine Strategy every 6 years. Future assessments will enable any trends to be identified, for example the number of regions achieving GES.

The results from 2010 to 2015 show pressure and disturbance caused by fishing activities to be widespread, occurring to some degree in 57% of the cells within UK waters. The charts show the aggregated values for seafloor disturbance from bottom fishing for the period 2010 to 2015. The highest level of disturbance is found in the English Channel and Southern Celtic Seas with 75% of both these areas being subject to high disturbance (categories 5 to 9). The extent of disturbance in the Northern North Sea and Southern North Sea is lower, 50% and 48% respectively, but still considerably above the target figure for GES. Within each assessment area there are grid cells showing no disturbance or low disturbance (categories 0 to 4), such as some central areas of the Northern North Sea. The Wider Atlantic (OSPAR Region V) was the only region to achieve GES over the assessment period 2010 to 2015 with 12% of its area subjected to high disturbance from bottom contact fishing.

C3 Diverse seas: status of marine mammals and marine birds

Short description

This indicator of diverse seas tracks changes in status assessments of marine mammals and marine birds. The assessments of marine mammals will be based on trends in the abundance of harbour seals; Atlantic grey seal pup production; and the abundance of cetaceans (whales and dolphins). The assessments of marine birds will be based on the proportion of breeding seabirds and wintering waterbirds that have met abundance targets, which were set to inform progress towards Good Environmental Status (GES). The GES assessments of marine mammals and birds were used in the updated UK Marine Strategy (UKMS) Part One (2019) and to fulfil reporting commitments under the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR).

Relevant goal in the 25 Year Environment Plan

- Thriving plants and wildlife

Relevant targets in the 25 Year Environment Plan

- Reversing the loss of marine biodiversity and, where practicable, restoring it
- Ensuring seafloor habitats are productive and sufficiently extensive to support healthy, sustainable ecosystems

Position in the natural capital framework

Condition of asset – seas

Related reporting commitments

- UK Marine Strategy (Marine Strategy Regulations 2010)
- Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)
- Berne Convention
- Convention on Biological Diversity Targets
- Relevant to Sustainable Development Goal 14

Geographical scope

Seals – England; Marine Birds – OSPAR marine regions (Greater North Sea and Celtic Seas).

Status of indicator development

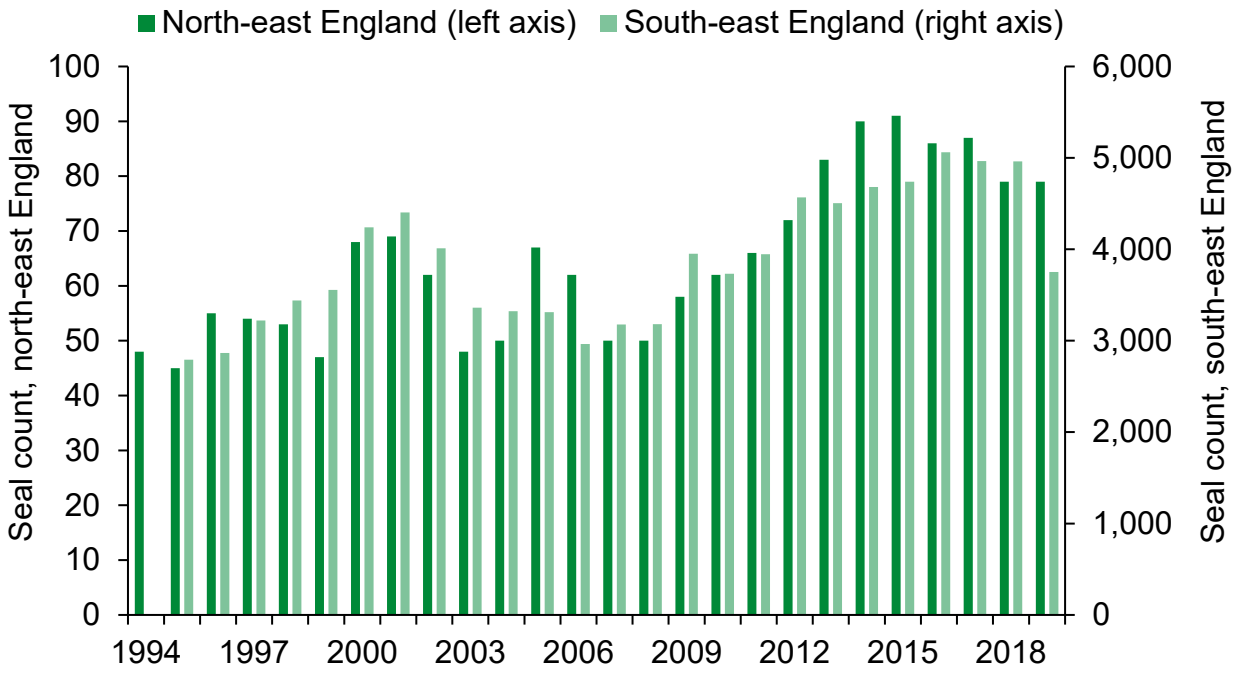
Interim

Readiness and links to data

This indicator is not available for reporting in 2021 in a finalised form as some further development is being undertaken. An interim indicator is presented here that shows (a) changes in the abundance of harbour seals and the production of Atlantic grey seal pups in the north-east and south-east of England, and (b) changes in the abundance of breeding seabirds and wintering waterbirds in the Greater North Sea and Celtic Seas (OSPAR marine regions including data from neighbouring countries). The assessments of seals and marine birds used for this interim indicator have been reported at a UK scale under the updated UKMS Part One (2019). The assessment for seals used data from 1994 to 2014, the most recent data on seals presented in the charts below are published by the Special Committee on Seals (SCOS). The indicator will be kept under review during the development of 'D5 Conservation status of our native species' as some elements of this indicator may ultimately be included in D5 instead. Cetaceans are not yet included in this indicator, but they will be once more definitive assessments can be made. Whale and

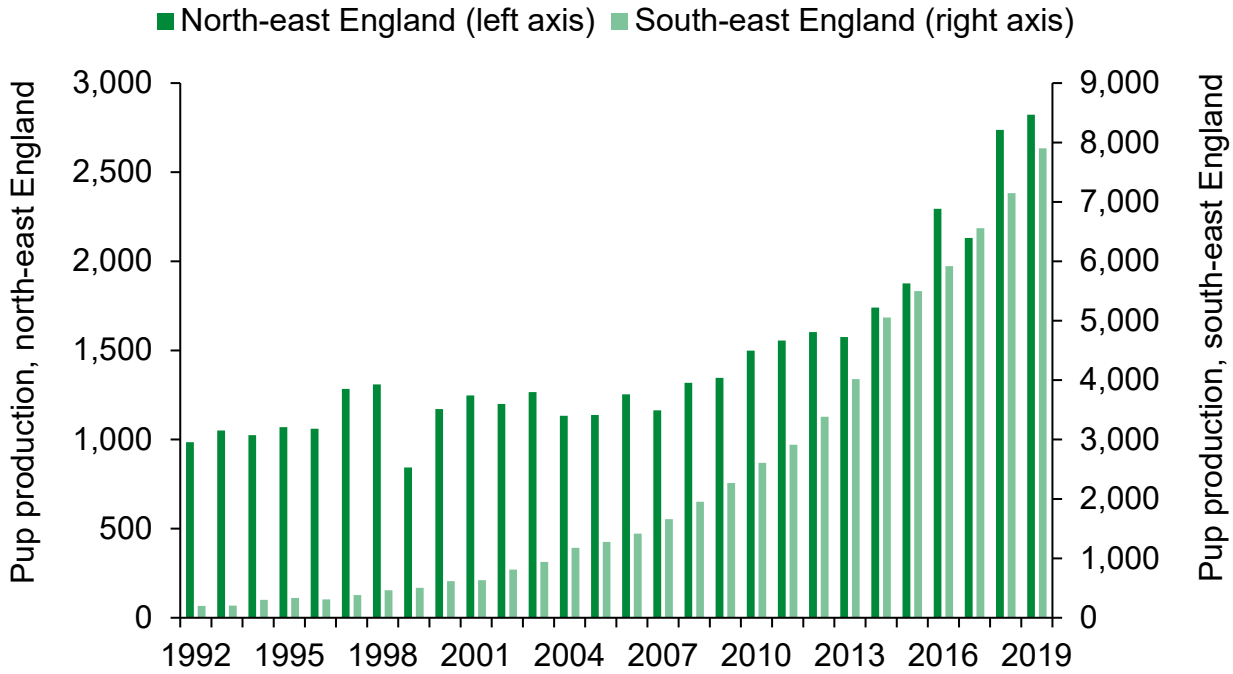
dolphin species were assessed in the UKMS Part One (2019) using data on abundance. However, for most species, trends in abundance could not be determined because there were an insufficient number of population estimates.

Figure C3ai (interim), Harbour seal abundance, north-east and south-east England, 1990 to 2019



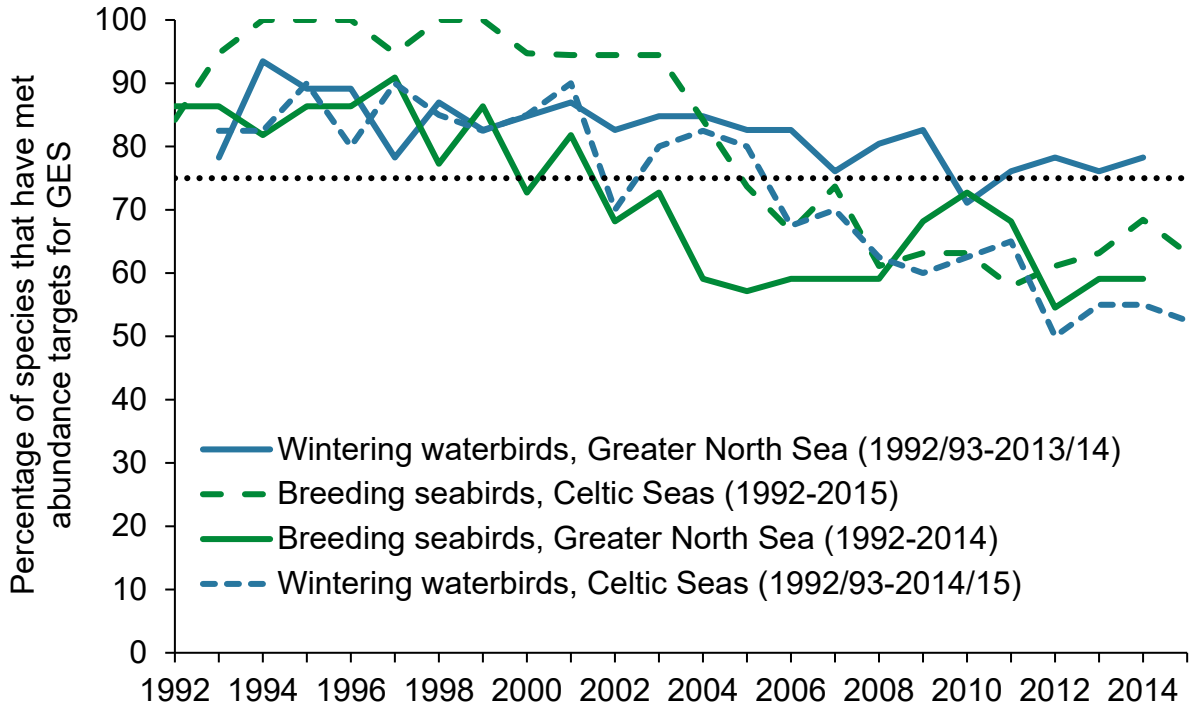
Source, Joint Nature Conservation Committee; Seal Mammal Research Unit

Figure C3aii (interim), Atlantic grey seal pup production, north-east and south-east England, 1992 to 2019



Source, Joint Nature Conservation Committee; Seal Mammal Research Unit

Figure C3b (interim), Percentage of breeding seabirds and wintering waterbirds meeting abundance targets for Good Environmental Status (GES), Greater North Sea and Celtic Seas, 1992 to 2015



Source, Department of Agriculture, Environment and Rural Affairs; Joint Nature Conservation Committee; Natural England; Natural Resources Wales; Scottish Natural Heritage

Note

While the data currently available for breeding seabirds and wintering waterbirds in this interim indicator predate the 25 Year Environment Plan, they provide the most recently available assessment of changes in GES of seals and marine birds. They enable a better understanding of a baseline from which to measure progress towards the goals of the 25 Year Environment Plan when the indicator is next updated.

Figures C3ai and C3aii allow the year-on-year trends in harbour seal abundance and grey seal pup production to be compared between north-east and south-east England, but differing scales on the y axes mean that care should be taken when comparing absolute numbers of harbour seals and/or grey seal pups between the 2 regions.

Trends in harbour seal abundance are derived from counts of seals on land in August of each year when they are moulting; Atlantic grey seal status is assessed using counts of pups that estimate pup production at major breading sites. Targets for GES were met if harbour seal abundance and Atlantic grey seal pup production: a) declined by less than an average of 1% per year during 2009 to 2014, or b) decreased by less than 25% since the baseline year (1992 or start of time series, if later). The UKMS Part One (2019) GES

assessment for seals covered the Celtic Seas and Greater North Sea. No data are available for harbour seal abundance in south-east England for 1994.

GES is achieved for breeding seabirds and wintering waterbirds if 75% or more species meet or exceed their thresholds for relative abundance (the dashed horizontal line on Figure C3b). The relative abundance of a species is the annual abundance expressed as a proportion of the baseline, which was taken as the abundance at the start of the timeseries in 1992. Thresholds for relative abundance were set to define GES: greater than 80% of the baseline for species that lay one egg and greater than 70% of the baseline for species that lay more than one egg. Data for wintering waterbirds are reported in the second of the 2 calendar years covered by each winter period, for example, data recorded for the winter of 1992/93 are reported as 1993 data in Figure C3b.

Trend description

a) Seals

Trends in harbour seal numbers in eastern England have been largely positive since the mid-1990s, although they appear to have levelled off and then fallen between 2015 and 2019. In the south-east, where the majority of the England population are found, numbers have fluctuated showing an increase from 2,793 in 1995 to 4,944 in 2018 followed by a sharp decline to 3,752 in 2019. Numbers are much lower in north-east England; they have shown a steady increase from 45 animals in 1994 to 91 in 2015 before declining to 79 in 2019. The UKMS Part One (2019) assessment based on the period 1994 to 2014 concluded that because of declines in Scotland, GES had not been achieved for harbour seal abundance in the UK Greater North Sea sub-region (which includes seal populations in the north-east and south-east England).

In south-east England annual Atlantic grey seal pup production has risen exponentially from just 200 pups in 1992 to 7,902 pups in 2019. In north-east England the rise in pup production has been steadier, from 985 pups in 1992 to 2,823 in 2019. The UKMS Part One (2019) assessment based on the period 1992 to 2014 concluded that GES for Atlantic grey seals has been achieved in the Greater North Sea.

b) Marine birds

The proportion of seabird species meeting thresholds for breeding abundance in the Greater North Sea and Celtic Seas has remained stable since 2012 but remains below the 75% target (59% in the Greater North Sea in 2014 and 63% in the Celtic Seas in 2015). The UKMS (2019) assessment concluded GES for breeding seabirds has not been achieved in the Greater North Sea or Celtic Seas.

The proportion of wintering waterbird species meeting thresholds for non-breeding abundance in the Greater North Sea has declined sharply, but is still on target (78% in 2013/14); the proportion of wintering waterbird species meeting thresholds in the Celtic Seas has also declined sharply (53% in 2014/15) and has remained below target since

2006. GES for non-breeding (wintering) waterbirds has been achieved in the Greater North Sea but not in the Celtic Seas.

C4 Diverse seas: condition of seafloor habitats

Short description

This indicator of diverse seas evaluates the condition of seafloor habitats. Seafloor habitats assessed include soft sediment invertebrate communities and intertidal communities of seagrass, rocky shore macroalgae and saltmarshes. Once developed the indicator will assess the impact of human activities on seafloor habitats.

Data for the seafloor habitat condition indicators comes from surveys undertaken on a 6-yearly cycle using methods developed for Water Framework Directive classifications, now transposed to the Water Framework Regulations (WFR). These include the intertidal rocky shore macroalgae tool, intertidal seagrass tool, Infaunal Quality Index, and intertidal saltmarsh tool.

Relevant goal in the 25 Year Environment Plan

- Thriving plants and wildlife

Relevant targets in the 25 Year Environment Plan

- Reversing the loss of marine biodiversity and, where practicable, restoring it
- Ensuring seafloor habitats are productive and sufficiently extensive to support healthy, sustainable ecosystems

Position in the natural capital framework

Condition of asset – seas

Related reporting commitments

- UK Marine Strategy (Marine Strategy Regulations 2010)
- Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)
- Relevant to Sustainable Development Goal 14
- Water Framework Regulations – The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017, The Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2017, Water Environment and Water Services (Scotland) Act 2003

Geographical scope

UK

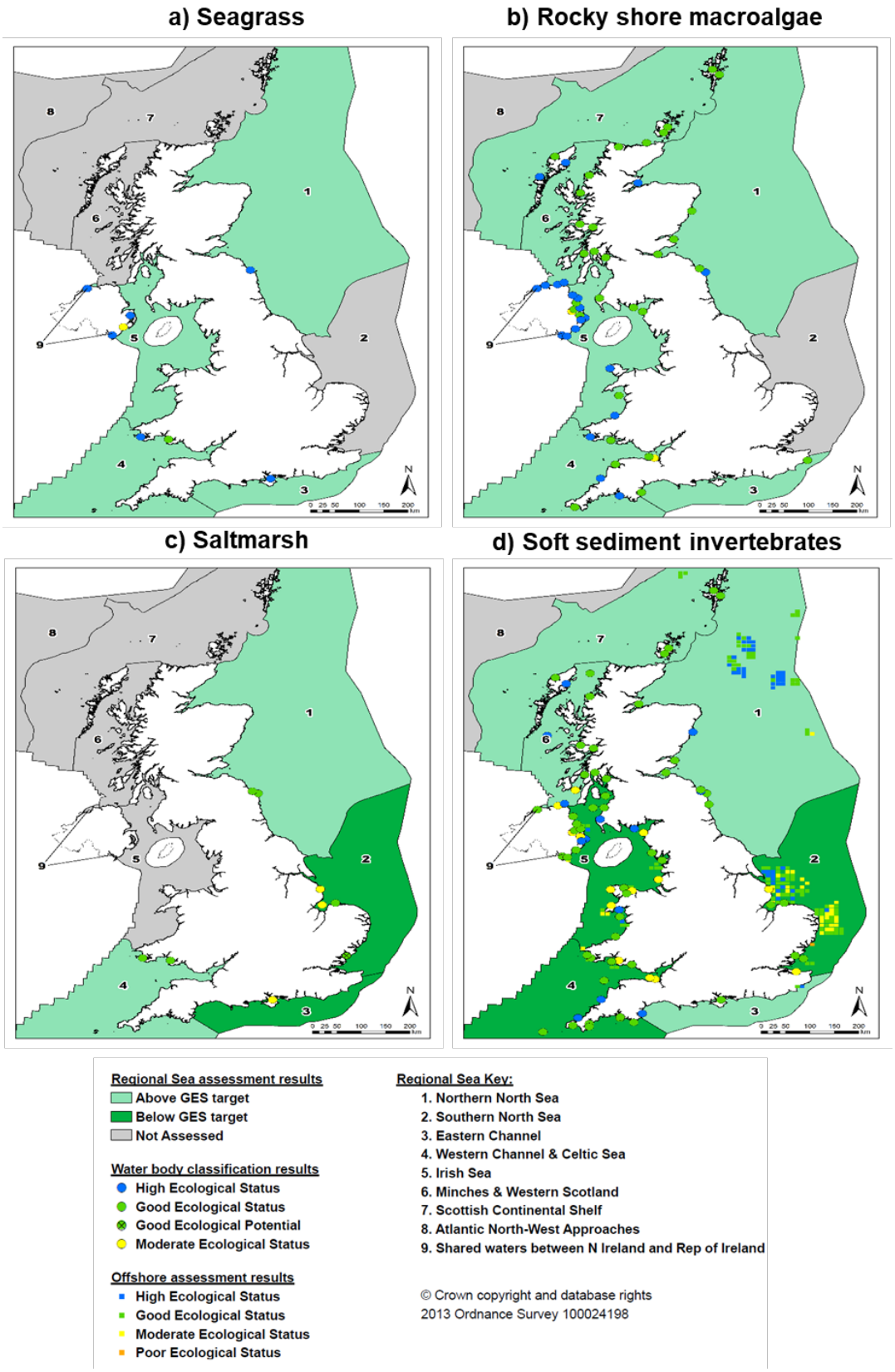
Status of indicator development

Interim

Readiness and links to data

This indicator is not available for reporting in 2021 in a finalised form. An interim indicator is presented here that shows target achievement for regional sea assessment, status of coastal water bodies and offshore unit assessments. The assessments used for this indicator have been reported under the updated UK Marine Strategy Part One (2019) to assess progress towards the UK Marine Strategy target of achieving and maintaining Good Environmental Status (GES) in UK seas. Data on benthic habitats, analytical methods and assessment are available. Further methodological development of this indicator is required and the indicator's format will evolve.

Figure C4 (interim), Regional sea assessments, and the status of coastal water bodies and offshore units for 4 UK seafloor habitats, 2010 to 2015



Source, Defra; Environment Agency; Joint Nature Conservation Committee; Natural Resources Wales; Scottish Environment Protection Agency

Note

Inshore data, predominantly collected between 2010 and 2015, were used to assess seagrass, rocky shore macroalgae and saltmarsh habitats. Soft sediment invertebrates were assessed using inshore and offshore intertidal and subtidal data collected between 2010 and 2015.

While the currently available data predate the 25 Year Environment Plan, they provide the most recently available assessment of the condition of benthic habitats. They enable a better understanding of a baseline from which to measure progress towards the goals of the 25 Year Environment Plan when the indicator is next updated.

Trend description

a) Seagrass

The UK Marine Strategy target for intertidal seagrass communities was met for all Regional Seas. Four Regional Seas were not assessed due to either an absence of intertidal habitat which is required by the indicator or an absence of existing classification data. The natural conditions required for seagrass beds to exist limits their occurrence in coastal water bodies. However, for those contributing, the quality threshold of ‘Good’ or ‘High’ Ecological Status was met for the majority of surveyed locations. The Irish Sea had the lowest extent of intertidal seagrass meeting the quality target, although the total remains markedly above the indicator quantity threshold of 85%.

b) Rocky shore macroalgae

The UK Marine Strategy target for the intertidal rocky shore macroalgae was met for all 7 assessed Regional Seas. Two Regional Seas were not assessed due to either an absence of intertidal habitat which is required by the indicator or an absence of existing WFD classification data.

c) Saltmarsh

The UK Marine Strategy target for the saltmarsh communities was largely met for the Celtic Seas and Northern North Sea but was not met for considerable areas of the Southern North Sea and the Eastern English Channel Regional Seas. Five Regional Seas were not assessed due to either an absence of intertidal habitat which is required by the indicator or an absence of existing classification data.

d) Soft sediment invertebrates

The UK Marine Strategy target for soft sediment (benthic) invertebrate communities was largely met for most Regional Seas including the Minches and Western Scotland, Scottish Continental Shelf, Shared Waters between Northern Ireland and Republic of Ireland, Northern North Sea and Eastern English Channel. The Western Channel and Celtic Seas did not reach the target largely due to the inshore classification results, while the failure of the Southern North Sea to meet the target can be attributed to the offshore results. The

Irish Sea did not meet the target due to both inshore and offshore results. The Atlantic North-West Approaches was not assessed due to an absence of data.

C5 Diverse seas: condition of pelagic habitats

Short description

This indicator of marine biodiversity tracks changes in the Good Environmental Status (GES) of pelagic habitats. The assessment is based on (a) changes in lifeforms (groups of plankton species that perform the same function in the marine environment) that make up plankton communities, and (b) changes in the biomass of phytoplankton and the abundance of zooplankton. These assessments have been used to inform the assessment of GES for the updated UK Marine Strategy Part One (2019) and to fulfil reporting commitments under the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR). The changes experienced by plankton communities could have implications for the health, (functioning, dynamics and structure) of the whole marine ecosystem.

Relevant goal in the 25 Year Environment Plan

- Thriving plants and wildlife

Relevant targets in the 25 Year Environment Plan

- Reversing the loss of marine biodiversity and, where practicable, restoring it
- Ensuring seafloor habitats are productive and sufficiently extensive to support healthy, sustainable ecosystems

Position in the natural capital framework

Condition of asset – seas

Related reporting commitments

- Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)
- UK Marine Strategy (Marine Strategy Regulations 2010)
- River Basin Management Plans
- Relevant to Sustainable Development Goal 14

Geographical scope

UK (Celtic Seas and Greater North Sea)

Status of indicator development

Interim

Readiness and links to data

This indicator is not available for reporting in 2021 in a finalised form as existing analytical methods are under ongoing development to gain a better understanding of the effects of the key anthropogenic pressures and climatic drivers. Recent progress with this work is presented in a primary research article by Bedford *et al.* (2020).The effects of these and future developments on this interim indicator will be considered as part of a wider review of the Outcome Indicator Framework. The assessments of pelagic habitats used for this interim indicator have been reported under the updated UK Marine Strategy Part One (2019) and to fulfil reporting commitments under the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR).

Note

Spatial representations and charts for the underlying data supporting this interim indicator can be accessed via the Marine Online Assessment Tool. While the currently available data predate the 25 Year Environment Plan, they provide the most recently available assessment of the condition of pelagic habitats. They enable a better understanding of a baseline from which to measure progress towards the goals of the 25 Year Environment Plan when the indicator is next updated.

Trend description

a) Changes in plankton communities, 2004-2008 to 2009-2014

The lifeforms (functional groups of species) that make up the plankton communities in the Celtic Seas and the Greater North Sea changed between the starting conditions period (2004 to 2008) and the current assessment period (2009 to 2014). Prevailing environmental conditions, in particular, climate change, are likely to be driving these observed changes, but the potential role of direct human activities such as fishing and nutrient inputs contributing to these changes cannot be ruled out. It is currently uncertain whether GES has been achieved.

b) Changes in phytoplankton biomass and zooplankton abundance, 2004-2008 to 2009-2014

In most areas of the Celtic Seas and the Greater North Sea, phytoplankton biomass has increased between the starting conditions period (2004 to 2008) and the current assessment period (2009 to 2014). Changes in zooplankton abundance varied across the 2 sub-regions assessed, with increases in some areas, decreases in others, and no change in some. This assessment identified, with a medium to high level of confidence, changes in phytoplankton biomass and zooplankton abundance which may have consequences on the functioning, dynamics and structure of the whole marine ecosystem. It is not yet possible to say if GES has been achieved.

C6 Diverse seas: status of threatened and declining features

Short description

This indicator of diverse seas shows changes in the status of vulnerable features flagged for protection, either listed in national legislation or international agreements. These features include the features of conservation interest protected in Marine Protected Areas, Natural Environment and Rural Communities Act Section 41 habitats and species of principle importance for conservation, and under the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR), amongst others. The overall indicator will be derived from the status of the individual features.

Relevant goal in the 25 Year Environment Plan

- Thriving plants and wildlife

Relevant target in the 25 Year Environment Plan

- Reversing the loss of marine biodiversity and, where practicable, restoring it

Position in the natural capital framework

Condition of asset – seas

Related reporting commitments

- Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)
- UK Marine Strategy (Marine Strategy Regulations 2010)
- Convention on Biological Diversity Aichi Target 12
- Relevant to Sustainable Development Goal 14

Geographical scope

England

Status of indicator development

In development

Readiness and links to data

This indicator is not available for reporting in 2021 as further development is needed. Some data are available on Marine Protected Areas.

C7 Healthy seas: fish and shellfish populations

Short description

This indicator tracks the health of our seas using assessments of fish populations (here separated into demersal communities and pelagic communities). It consists of 2 metrics. The first metric looks at the size of the fish in a community (Typical Length) and the second looks at the composition of fish communities (Mean Maximum Length). Together these metrics tell us about the health and status of fish communities. A healthy fish community will be made up of species in the expected ratio of numbers of individuals, and with individual species showing the age classes and sizes consistent with a healthy population. Typical Length: a reduction in the proportion of larger, older, fish (as measured by Typical Length) of several species, suggests the top (predator) level of the food web is in poor condition. Mean Maximum Length: if the species that tend towards larger individuals are depleted and smaller-bodied species become more abundant (shown by a reduction in Mean Maximum Length), the species composition of the community can change, suggesting prolonged periods of pressure. When the community is dominated by slow growing species (as expected at low Maximum Mean Length), the size structure is limited in its ability to recover (reduced Typical Length).

Relevant goal in the 25 Year Environment Plan

- Thriving plants and wildlife

Relevant targets in the 25 Year Environment Plan

- Making sure populations of key species are sustainable with appropriate age structures
- Reversing the loss of marine biodiversity and, where practicable, restoring it
- Ensuring that all fish stocks are recovered to and maintained at levels that can produce their maximum sustainable yield

Position in the natural capital framework

Condition of asset – seas

Related reporting commitments

- Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)
- UK Marine Strategy (Marine Strategy Regulations 2010)
- International Council for Exploration of the Seas (ICES)
- Convention on Biological Diversity Aichi Target 6
- Relevant to Sustainable Development Goal 14

Geographical scope

UK (Celtic Seas and Greater North Sea)

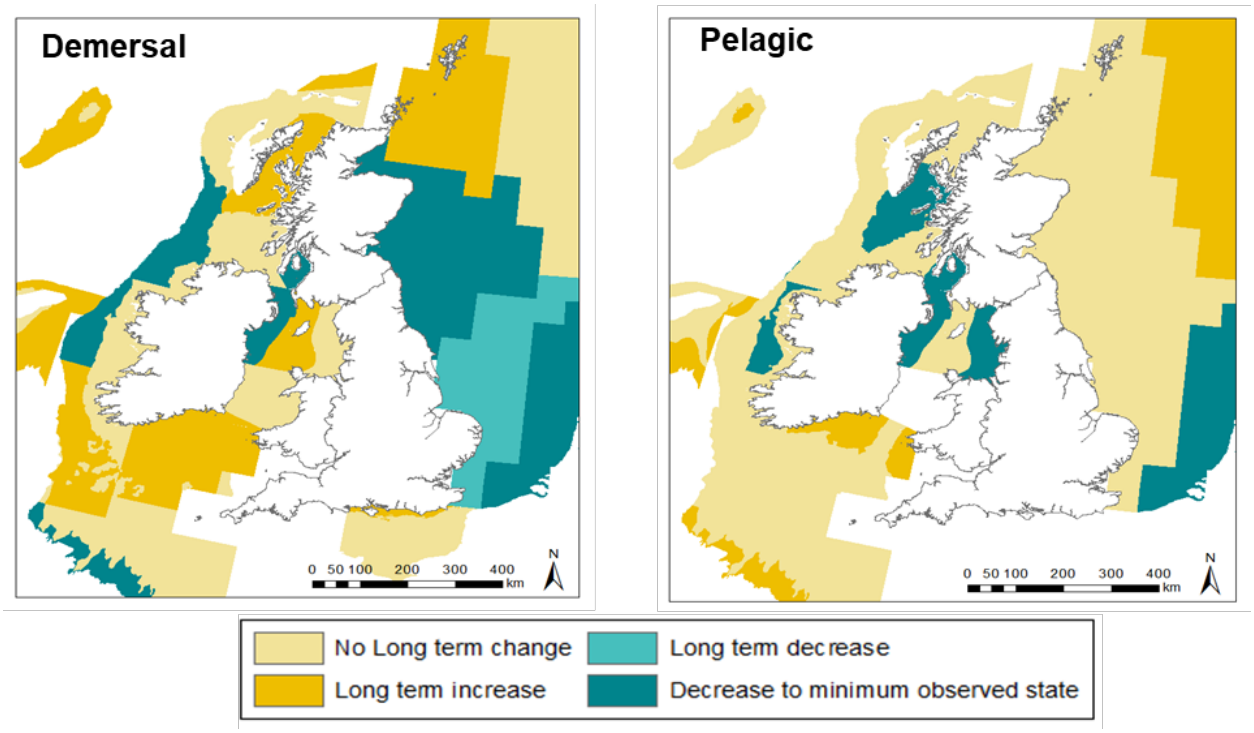
Status of indicator development

Interim

Readiness and links to data

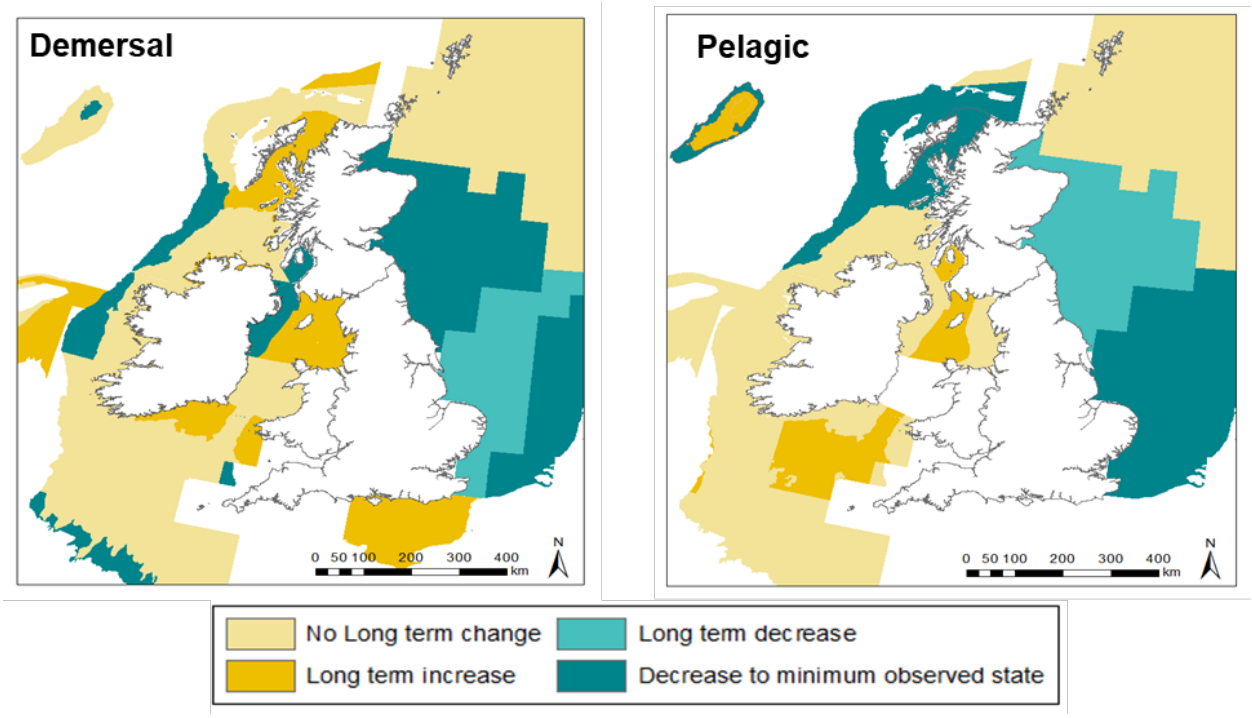
This indicator is not available for reporting in a finalised form. Further development of this indicator is required to include trophic guild biomass and therefore improve community classification. An interim indicator is presented here with communities classified as demersal or pelagic. The assessments used for this interim indicator have been reported under the UK Marine Strategy Part One (2019). Data on fish populations, analytical methods and assessment are available.

Figure C7a (interim), Long-term changes in the typical length of demersal and pelagic fish communities in UK waters and surrounding areas, 1980 or 1990 to 2015 or 2016



Source, Centre for Environment, Fisheries & Aquaculture Science; International Council for Exploration of the Sea; Marine Scotland

Figure C7b (interim), Long-term changes in the mean maximum length of demersal and pelagic fish communities in UK waters and surrounding areas, 1980 or 1990 to 2015 or 2016



Source, Centre for Environment, Fisheries & Aquaculture Science; International Council for Exploration of the Sea; Marine Scotland

Note

Assessment period starts in the 1980s or 1990s and ends in 2015 or 2016 depending on the survey.

For the Typical Length maps:

- Long-term increase: an increase in the size of fish within the community over the period
- No long-term change: no change in the size of fish
- Long-term decrease: the size of fish in the community has decreased from an earlier period but has increased from a more recent period
- Decrease to minimum observed state: the fish in the community are currently at the lowest size recorded

For the Mean Maximum Length maps:

- Long-term increase: the fish are shifting back towards larger species
- No long-term change: no change in the composition of fish communities
- Long-term decrease: more smaller species than in an earlier period but less than in a more recent one

- Decrease to minimum observed state: the community has the highest proportion of small species recorded

While the currently available data predate the 25 Year Environment Plan, they provide the most recently available assessment of fish and shellfish populations. They enable a better understanding of a baseline from which to measure progress towards the goals of the 25 Year Environment Plan when the indicator is next updated.

Trend description

a) Typical Length of demersal and pelagic fish communities

In the Channel, northern North Sea and the eastern Irish Sea, the health of the demersal fish community has improved since the 1990s, with an increasing contribution of species that attain a large size (Typical Length). In the central and southern North Sea and on the shelf edge to the west of Scotland, the balance of species within demersal communities, relative to the early 1980s, has shifted towards smaller bodied fish (low Typical Length) indicating this community is in poorer health. In the northern North Sea no change in the Typical Length in the pelagic fish community is evident. The Typical Length of pelagic fish generally shows no long-term change at the sub-regional level in the Celtic Seas.

b) Mean Maximum Length of demersal and pelagic fish communities

In the central and southern North Sea and on the shelf edge to the west of Scotland, the balance of species within demersal communities, relative to the early 1980s, has shifted towards smaller species (low Mean Maximum Length), indicating this community is in poorer health. There has been no long-term change in Mean Maximum Length of demersal fish communities in the northern North Sea. Within the southern and central North Sea, the Mean Maximum Length of pelagic fish communities is declining suggesting the proportion of large or slow growing species is declining. There is no long-term change in the Mean Maximum Length in the northern North Sea.

C8 Healthy seas: marine food webs functioning

Short description

This indicator will track the health of our seas using metrics on the size, structure and function of different feeding (trophic) levels in marine food webs. The indicator will focus on open ocean (pelagic) habitats and populations of key species groups within the food web. These show whether ecosystems are healthy and are being used sustainably. Currently, the metrics within this indicator are being developed for the UK Marine Strategy Descriptors 1 (biodiversity), 4 (food webs) and 6 (seafloor integrity) and the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR).

Relevant goal in the 25 Year Environment Plan

- Thriving plants and wildlife

Relevant targets in the 25 Year Environment Plan

- Making sure populations of key species are sustainable with appropriate age structures
- Reversing the loss of marine biodiversity and, where practicable, restoring it
- Ensuring that all fish stocks are recovered to and maintained at levels that can produce their maximum sustainable yield

Position in the natural capital framework

Condition of asset – seas

Related reporting commitments

- Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)
- UK Marine Strategy (Marine Strategy Regulations 2010)
- International Council for Exploration of the Seas (ICES)
- Convention on Biological Diversity Aichi Target 6
- Relevant to Sustainable Development Goal 14

Geographical scope

UK

Status of indicator development

In development

Readiness and links to data

This indicator is not available for reporting in 2021 as significant development is required. Research is underway to further develop the food web metrics that constitute this indicator. Analytical methods and some data on food webs are available.

C9 Healthy seas: seafloor habitats functioning

Short description

This indicator will show changes in the natural functionality and extent of seafloor habitats able to support a healthy and productive ecosystem. The indicator is linked to the UK Marine Strategy Descriptor 6 (Seafloor Integrity). The indicator will be derived from the integration of metrics of individual broad habitat types and selected vulnerable habitats.

Well-functioning seafloor habitats (physically and structurally) are both productive and sufficiently extensive, to carry out natural functionality, including the necessary ecological processes which underpin ecosystem goods and services, and are capable of supporting a healthy and sustainable ecosystem for the long term.

Relevant goal in the 25 Year Environment Plan

- Thriving plants and wildlife

Relevant target in the 25 Year Environment Plan

- Ensuring seafloor habitats are productive and sufficiently extensive to support healthy, sustainable ecosystems

Position in the natural capital framework

Condition of asset – seas

Related reporting commitments

- Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)
- UK Marine Strategy (Marine Strategy Regulations 2010)
- Water Framework Regulations – The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017, The Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2017, Water Environment and Water Services (Scotland) Act 2003
- Relevant to Sustainable Development Goal 14

Geographical scope

UK

Status of indicator development

In development

Readiness and links to data

This indicator is not available for reporting in 2021 as further development is needed. Analytical methods and some data on benthic habitats are available.

C10 Productive seas: fish and shellfish stocks fished sustainably

Short description

This indicator shows changes in the proportion of commercial fish and shellfish stocks that are within safe biological limits and fished sustainably. The indicator is derived from assessments of individual stocks. Where available, the assessment of stocks against their Maximum Sustainable Yield (MSY) will be incorporated into the overall indicator. The indicator is linked to UK Marine Strategy Descriptor 3 (Commercial Fish and Shellfish) and the Convention on Biological Diversity sustainable fisheries indicators and is derived from International Council for the Exploration of the Sea and national stock assessments. The data presented in this indicator for the proportion of marine fish quota stocks of UK interest exploited above or below maximum sustainable yield were presented as part of indicator E9 Percentage of our seafood coming from healthy ecosystems, produced sustainably in 2019. These data are now presented here in C10 because they are specific to fish and shellfish rather than reflecting the health of the marine ecosystem as a whole.

Relevant goal in the 25 Year Environment Plan

- Using resources from nature more sustainably and efficiently

Relevant target in the 25 Year Environment Plan

- Ensuring that all fish stocks are recovered to and maintained at levels that can produce their maximum sustainable yield

Position in the natural capital framework

Condition of asset – seas

Related reporting commitments

- UK Marine Strategy (Marine Strategy Regulations 2010)
- Convention on Biological Diversity Aichi Target 6
- Relevant to Sustainable Development Goals 12 and 14

Geographical scope

UK

Status of indicator development

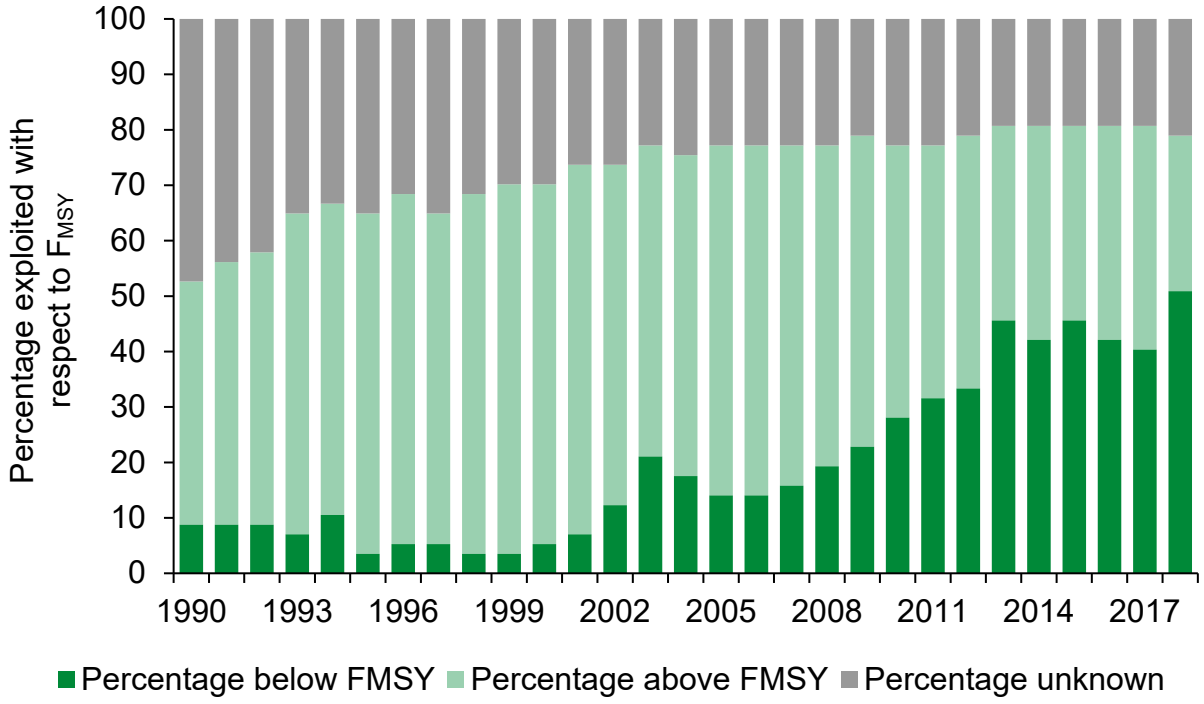
Interim

Readiness and links to data

This indicator is not available for reporting in 2021 in a finalised form. An interim indicator is presented here that shows: the percentage of stocks fished at or below the level

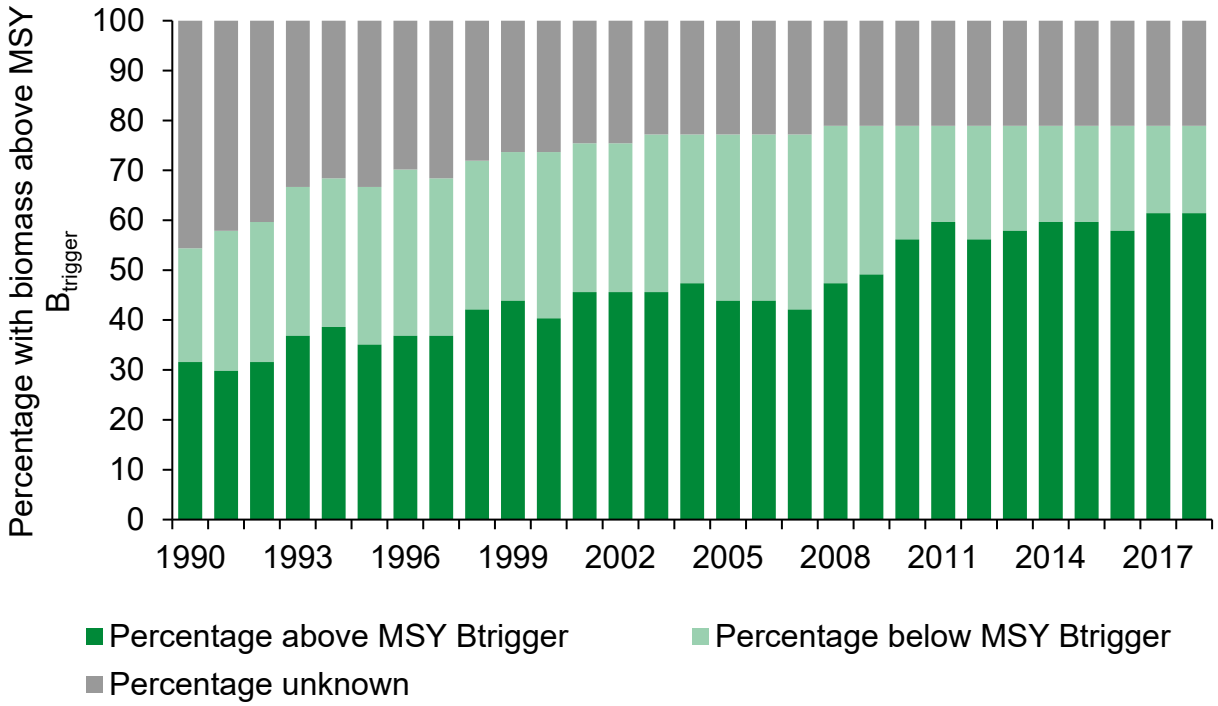
capable of producing Maximum Sustainable Yield (F_{MSY}); and the percentage of stocks with biomass above the level capable of producing Maximum Sustainable Yield (MSY $B_{trigger}$). The assessments used for this interim indicator have been reported under the UK Marine Strategy Part One (2019) using data from 1990 to 2015 for F_{MSY} and from 1990 to 2016 for MSY $B_{trigger}$. Data on commercially exploited fish and shellfish, analytical methods and assessment are available. Data are also published annually in the UK Biodiversity Indicators. National shellfish stocks assessments are updated on a 3-year cycle. These data are not included in the interim indicator but were published as part of the UK Marine Strategy Part One (2019) and will be included in the final indicator. Once population age and size distribution assessments are developed, they will be included to provide further detail for this indicator.

Figure C10a (interim), Marine fish (quota) stocks of UK interest harvested sustainably, 1990 to 2018



Source, Centre for Environment, Fisheries & Aquaculture Science; International Council for the Exploration of the Sea

Figure C10b (interim), Marine fish (quota) stocks of UK interest with biomass at levels capable of maintaining full reproductive capacity, 1990 to 2018



Source, Centre for Environment, Fisheries & Aquaculture Science; International Council for the Exploration of the Sea

Note

Figures C10a and C10b are based on 57 stocks of interest to the UK, derived from stock assessment reports**.** When new stock assessment data are incorporated into the model that compiles this time series, all data are subject to minor revisions.

Trend description

a) Marine fish (quota) stocks of UK interest harvested sustainably

Overall, there is evidence of a positive trend towards a greater proportion of stocks fished sustainably and within safe biological limits. The percentage of fish stocks (including *Nephrops*) fished at or below levels capable of producing maximum sustainable yield (F_{MSY}) has increased from 9% in 1990 to 51% in 2018. The percentages fished above F_{MSY} and at unknown levels relative to F_{MSY} have both decreased over the same time period. In the most recent year of assessment (2018), there was an 11 percentage point increase in the percentage of stocks with fishing pressure below F_{MSY}.

b) Marine fish (quota) stocks of UK interest with biomass at levels capable of maintaining full reproductive capacity

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 (MSY $B_{trigger}$). The percentage of stocks subject to quota management and achieving this goal has increased from 32% in 1990 to 61% in 2018. The percentages of stocks below MSY $B_{trigger}$ and the percentage of stocks with unknown SSB have both decreased over the same time period, the latter by considerably more than the former.

C11 Productive seas: status of sensitive fish and shellfish stocks

Short description

This indicator will track changes in the abundance, distribution and condition of fish and shellfish species at risk of depletion. The indicator will be derived from individual species assessments; note that some species may also be included in C6 Diverse seas: status of threatened and declining features. The indicator will be assessed to account for the expected status in line with prevailing environmental conditions and not adversely impacted by human activity. The indicator is linked to the UK Marine Strategy Descriptor 1 biodiversity and Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR).

Relevant goal in the 25 Year Environment Plan

- Using resources from nature more sustainably and efficiently

Relevant target in the 25 Year Environment Plan

- Ensuring that all fish stocks are recovered to and maintained at levels that can produce their maximum sustainable yield

Position in the natural capital framework

Condition of asset – seas

Related reporting commitments

- Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)
- UK Marine Strategy (Marine Strategy Regulations 2010)
- Convention on Biological Diversity Aichi Target 6
- Relevant to Sustainable Development Goals 12 and 14

Geographical scope

UK

Status of indicator development

In development

Readiness and links to data

This indicator is not available for reporting in 2021 as further development is required. Analytical methods and some data on sensitive fish species are available.

Theme D: Wildlife

D1 Quantity, quality and connectivity of habitats

Short description

This indicator will measure changes in extent, condition, connectivity and function of terrestrial and freshwater habitats in England. In the 25 Year Environment Plan, government committed to establishing a Nature Recovery Network: an increasingly connected network of places that are richer in wildlife and more resilient to climate change. The network will build on the recommendations from 'Making space for nature', led by Professor Sir John Lawton, and will provide wider environmental benefits, including carbon capture and opportunities for recreation.

Data are available to measure some aspects of this indicator such as extent and condition of some habitats, but further work is required to assess habitats beyond protected sites, and reliable methods for measuring ecological connectivity need to be further tested. Some indicators of aspects of ecosystem functions and processes are available, but these are not comprehensive. New methods of Earth Observation (EO) together with development of measures of favourable conservation status and long-term site-based monitoring offer good opportunities to develop this indicator.

Relevant goals in the 25 Year Environment Plan

- Thriving plants and wildlife
- Mitigating and adapting to climate change

Relevant targets in the 25 Year Environment Plan

- Creating or restoring 500,000 hectares of wildlife-rich habitat outside the protected area network
- Implementing a sustainable and effective second National Adaptation Programme

Position in the natural capital framework

Condition of asset – species and ecological communities

Related reporting commitments

- Contributions to Convention on Biological Diversity; Conservation of Habitats and Species Regulations 2017 (as amended)
- May provide evidence in support of Climate Change Risk Assessment and the Adaptation Sub Committee's assessment of the National Adaptation Programme, under the Climate Change Act (2008)

Geographical scope

England. Some data, for example EO data or site assessments may be disaggregated to local sites.

Status of indicator development

In development

Readiness and links to data

This indicator is not available for reporting in 2021. Several elements of this indicator are published as England Biodiversity Indicators but substantial further work is required to bring these elements together with new data to assess overall resilience. Ongoing work to progress this indicator includes the development of an earth observation approach for habitat quantity, statistical analysis of attributes to assess habitat quality and testing of different approaches to measure habitat connectivity.

D2 Extent and condition of protected sites – land, water and sea

Short description

Protected sites are areas of land, inland water and the sea that have special legal protection to conserve important habitats and species in England. These include our Sites of Special Scientific Interest (SSSIs), Marine Protected Areas (MPAs), Special Areas of Conservation, Special Protection Areas and Ramsar sites. This indicator has 2 components: (a) extent (hectares) of protected sites on land, freshwater and at sea and (b) condition of protected sites on land, water and at sea. Condition for terrestrial sites is assessed against relevant common standards agreed by the UK conservation agencies. Condition methodology for MPAs is currently under development.

Relevant goal in the 25 Year Environment Plan

- Thriving plants and wildlife

Relevant targets in the 25 Year Environment Plan

- Increasing the proportion of protected and well-managed seas, and better managing existing protected sites

- Restoring 75% of our one million hectares of terrestrial and freshwater protected sites to favourable condition, securing their wildlife value for the long term

Position in the natural capital framework

Condition of asset – species and ecological communities

Related reporting commitments

- The Conservation of Habitats and Species Regulations 2017 (as amended)
- The Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended)
- The Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention)
- Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)
- Convention on Biological Diversity

Geographical scope

England. Data may be disaggregated to individual sites and features.

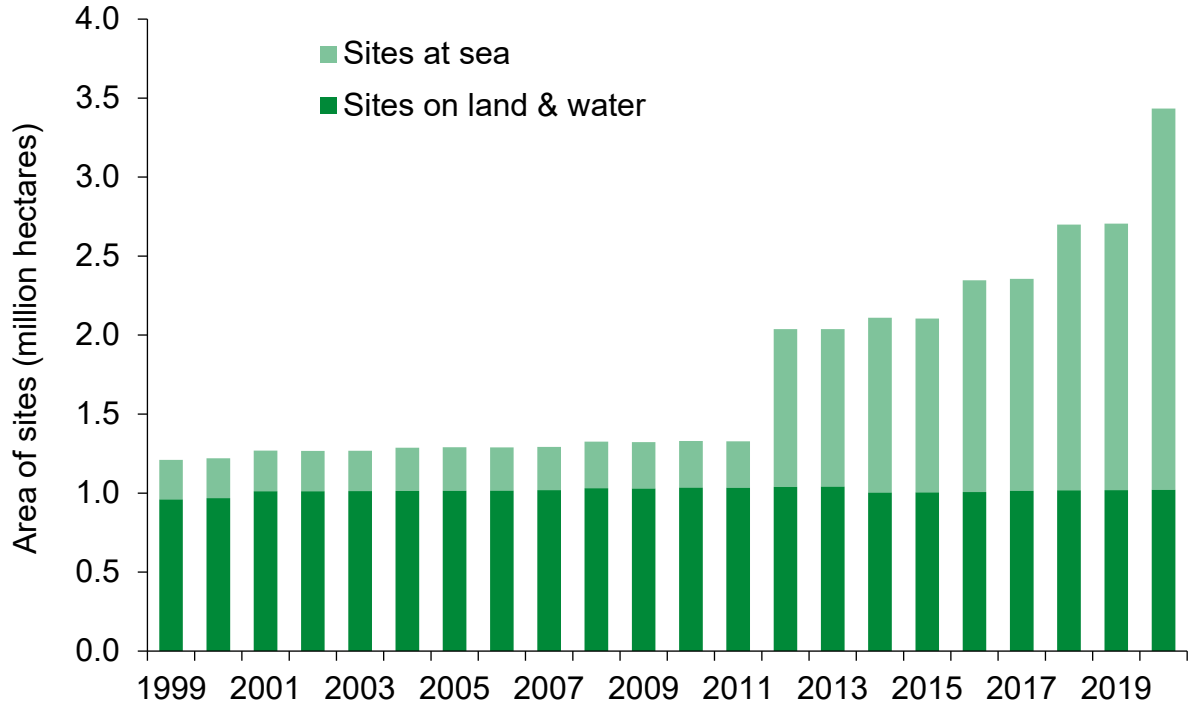
Status of indicator development

Interim

Readiness and links to data

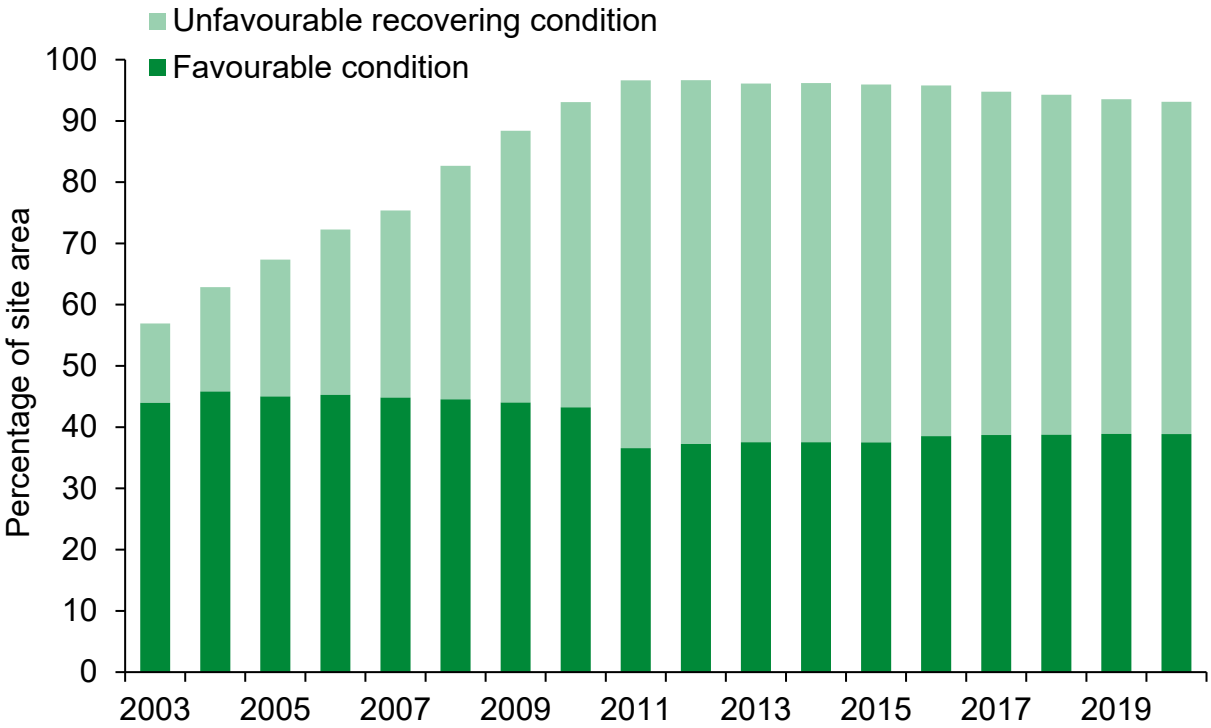
This indicator is not available for publishing in 2021 in a finalised form. An interim indicator is presented here that shows the extent of protected areas (D2a) and condition of SSSIs (D2b) in England. Data for this interim indicator are published annually as part of England's biodiversity indicators. Work is underway to improve reporting for terrestrial and freshwater sites and some further work is required to implement a methodology for assessing the condition of MPAs so that an indicator of condition (D2b) that includes all sites on land, on water and at sea can be produced.

Figure D2a (interim), Extent of protected sites in England, 1999 to 2020



Source, Natural England

Figure D2b (interim), Condition of Sites of Special Scientific Interest in England, 2003 to 2020



Source, Natural England

Note

The extent of protected sites is the cumulative area assessed in March of each year shown. It is based on the following designations: Sites of Special Scientific Interest (SSSI), Special Areas of Conservation (SAC), Special Protection Areas (SPA), National Nature Reserves (NNR), Ramsar sites and Marine Conservation Zones (MCZ). For sites that span English borders, only the area within England is included. Sites between mean low water and the 12 nautical mile limit are included in the 'marine' measure; sites beyond 12 nautical miles, in UK waters, are excluded.

Site condition is the cumulative area assessed in March of each year shown. As new assessments are completed they replace the previous ones, so Figure D2b is a snapshot of the condition of the site network at a given point in time.

Trend description

a) Extent of Protected sites

The total extent of land, water and sea protected in England through national and international protected areas increased from 1.2 million hectares in 1999 to 3.4 million hectares in 2020. The area of sites at sea has increased substantially, by more than 8 times since the time series began in 1999 although the majority of this increase took place between 2011 and 2020. The area of sites on land and water has remained relatively stable over time, increasing by 6% between 1999 and 2020.

b) Condition of Sites of Special Scientific Interest

There has been a net decrease in the area of SSSIs in favourable condition; down from 44% in 2003 to 38.9% in 2020. The sudden drop in the area of SSSIs in favourable condition from 43.2% in 2010 to 36.6% in 2011 was largely due to a more rigorous application of the 'Common Standard for Monitoring' protocols in assessing feature condition. However, since then, the area recorded as being in favourable condition has increased. The area of SSSIs in unfavourable recovering condition in 2020 (54.2%) is considerably higher than the 13% recorded in 2003.

D3 Area of woodland in England

Short description

This indicator shows change in the area of broadleaved and conifer woodland in England. Woodland as defined for the National Forest Inventory is land under stands of trees with a minimum area of 0.5 hectares, a width of at least 20 metres, and a canopy cover of at least 20% or having the potential to achieve this. The definition relates to land use, rather than land cover, so integral open space and areas of felled trees that are awaiting

restocking (replanting) are included as woodland. Woodland is a key natural capital asset that provides many natural capital benefits, such as the provision of timber and other wood products, carbon storage, habitats for wildlife, and opportunities for exercise and recreation.

Relevant goals in the 25 Year Environment Plan

- Using resources from nature more sustainably and efficiently
- Thriving plants and wildlife
- Enhanced beauty, heritage and engagement with the natural environment

Relevant targets in the 25 Year Environment Plan

- Creating and Restoring 500,000 hectares of wildlife-rich habitat outside the protected sites network
- Increasing woodland area in England in line with our aspiration of 12% cover by 2060

Position in the natural capital framework

Condition of assets – land; species and ecological communities

Related reporting commitments

- Equivalent data at UK level are reported to the United Nations Food and Agriculture Organisation for its regular Forest Resources Assessment, and to Forest Europe for reporting to the Ministerial Conference on the Protection of Forests in Europe and publication in the State of Europe's Forests

Geographical scope

England. The related National Forest Inventory woodland map geospatial Open Data can be disaggregated to any sub-national geography required.

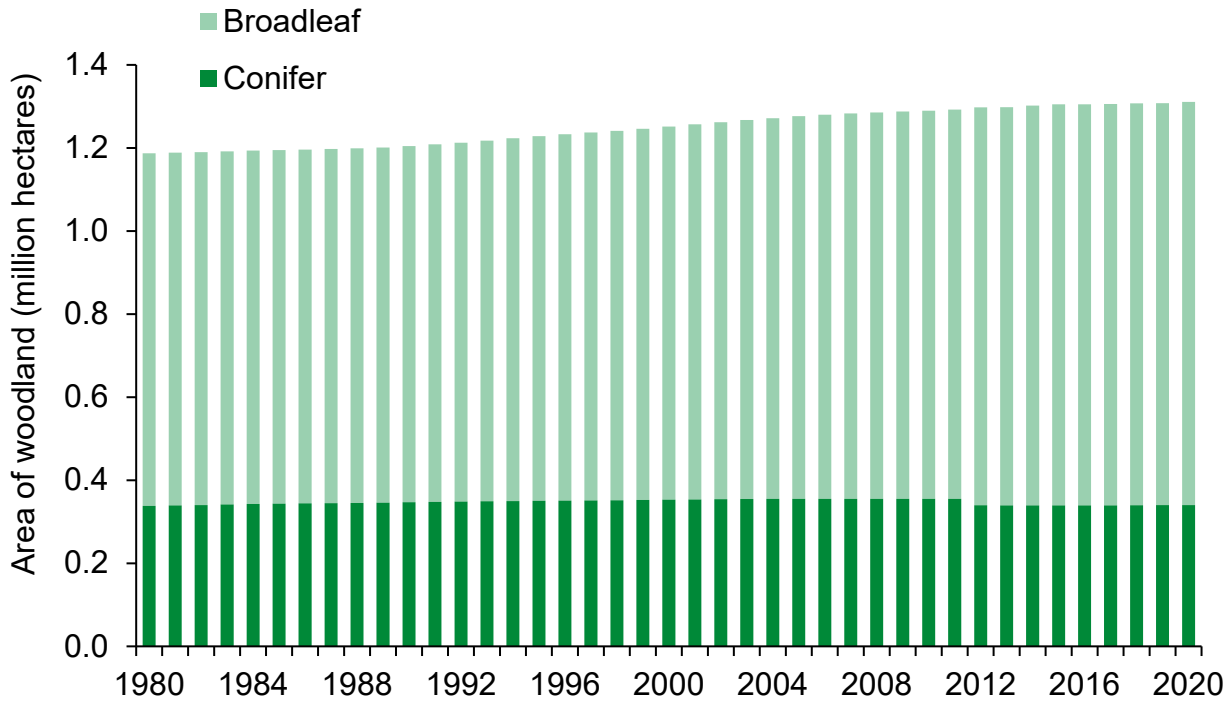
Status of indicator development

Final

Readiness and links to data

Updates are published annually in Forestry Statistics (Forest Research), with additional commentary on recent trends and new planting of trees in the quarterly Headline Key Performance Indicators reports (Forestry Commission).

Figure D3, Area of woodland in England, 1980 to 2020



Source, Forestry Commission; Forest Research

Trend description

The total area of woodland in England has increased from 1.24 million hectares in 1998 to 1.31 million hectares in 2020, equating to an increase from 9.5% to 10.05% of the land area of England. This growth has been driven by an increase in broadleaf woodland; the area of conifer woodland in England has remained relatively static over the last 20 years.

D4 Relative abundance and/or distribution of widespread species

Short description

This indicator will use regularly collected data to track changes in relative abundance and/or distribution of species which are widespread and characteristic of different broad habitats in England including birds, bats, butterflies, moths, other invertebrates and plants. The indicator will have 2 components: (a) changes in the relative abundance of those widespread species for which relevant data are available; and, (b) changes in the distribution (the number of 1 km grid squares in which species are recorded in any given year) of widespread species for which relevant data are available.

Relevant goal in the 25 Year Environment Plan

- Thriving plants and wildlife

Relevant target in the 25 Year Environment Plan

- Taking action to recover threatened, iconic or economically important species of animals, plants and fungi, and where possible to prevent human-induced extinction or loss of known threatened species in England and the Overseas Territories

Position in the natural capital framework

Condition of asset – species and ecological communities

Related reporting commitments

- Relevant to Convention on Biological Diversity
- Sustainable Development Goal 15 Life on Land

Geographical scope

England

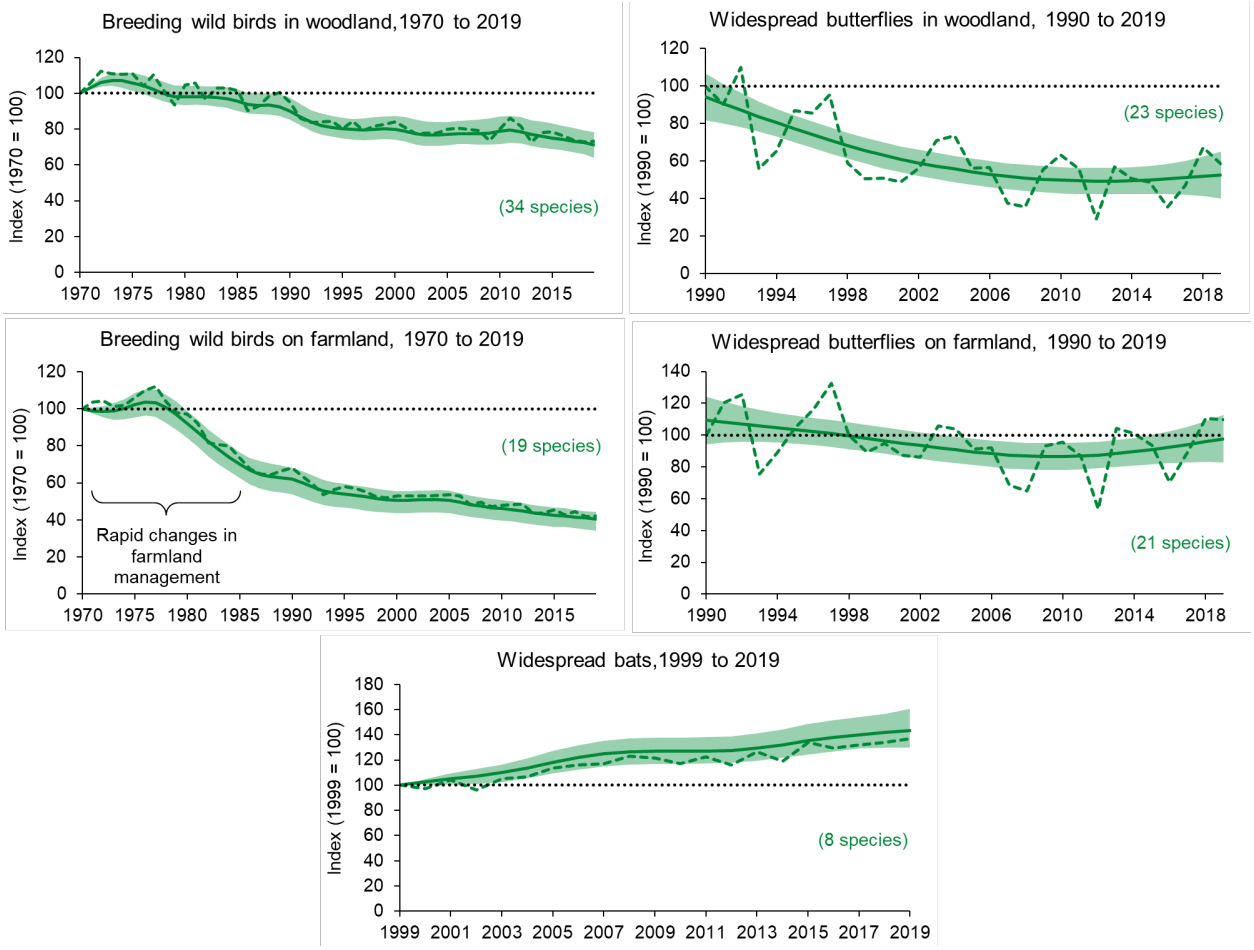
Status of indicator development

Interim

Readiness and links to data

This indicator is not available for reporting in 2021 in a finalised form. An interim indicator is presented here that shows trends in the abundance of breeding wild birds, widespread butterflies and bats in England. The expectation is that this indicator will be expanded to include more species groups and habitat types in the future. Some data are already published annually elsewhere (wild birds, butterflies and bats), and methods for analysing trends in plants are being developed. Further work is required to combine and present trends for different species groups and habitat types within the abundance and distribution measures in this indicator.

Figure D4 (interim), Trends in abundance of wild birds, butterflies and bats in England



Source, Bat Conservation Trust; British Trust for Ornithology; Butterfly Conservation; Defra; Joint Nature Conservation Committee; Royal Society for the Protection of Birds; UK Centre for Ecology & Hydrology

Note

The graphs show the unsmoothed (dashed lines) and smoothed (solid lines) trends for each of the species indices; the shaded areas represent the 95% confidence intervals (measures of uncertainty) for the smoothed trends; and the figures in brackets show the number of species included within each composite index.

Trend description

The indicators for breeding wild birds in woodland and on farmland in England have both declined between 1970 and 2019; the former by almost 40%, the latter by 60%. Farmland birds experienced steeper declines during the late 70's and early 80's because of rapid changes in farmland management.

The indicators for widespread butterflies in woodland and on farmland in England also declined between 1990 and 2010, the former more steeply than the latter. However, in recent years, the woodland butterfly indicator has shown little change while the farmland butterfly indicator has increased to a figure close to its 1990 baseline value.

The indicator for widespread bats in England has increased by approximately 40% since the turn of the century. The bat species within this index vary in their habitat requirements, but all occur in farmland and woodland landscapes.

Whilst these overall trends are clear from the charts, they mask the trends for individual species within each index – some farmland and woodland species trends have increased whereas others have either remained the same or decreased over time. Further details on these individual species trends are available in the source documents.

D5 Conservation status of our native species

Short description

This indicator will track changes in the national (GB) extinction risk faced by terrestrial, freshwater and marine species using the International Union for Conservation of Nature's (IUCN) Red List categories and criteria. The Red-listing process classifies each species into one of 10 categories including Least Concern, Near Threatened, Vulnerable, Endangered, Critically Endangered and Regionally Extinct. A simple Red List index will be constructed to summarise the changes in numbers of species between each category over time.

Relevant goal in the 25 Year Environment Plan

- Thriving plants and wildlife

Relevant target in the 25 Year Environment Plan

- Taking action to recover threatened, iconic or economically important species of animals, plants and fungi, and where possible to prevent human-induced extinction or loss of known threatened species in England and the Overseas Territories

Position in the natural capital framework

Condition of asset – species and ecological communities

Related reporting commitments

- Contributes to reporting under the Habitats and Species Conservation Regulation 2017, which meets our commitments under the Convention on Biological Diversity
- Relevant to Sustainable Development Goal 15 (Life on land)
- May provide evidence in support of Climate Change Risk Assessment under the Climate Change Act (2008)

Geographical scope

Great Britain

Status of indicator development

In development

Readiness and links to data

This indicator is not available for reporting in 2021. However, baseline assessment data for approximately 10,000 species are already available, including those for Mammals, Birds, many Invertebrate groups, Vascular Plants, Lichens, Bryophytes and some Fungi. Assessments for several thousand more species are currently underway to increase the diversity of species in the baseline and the Indicator. Further development work is also underway, exploring the sensitivity of the index to such factors as the real rates of change across categories under various policy scenarios and the frequency with which assessments are repeated/updated. Data on the extinction risk faced by individual species in GB are published on the JNCC website, whilst information on the derivation of a Red List Index is available on the IUCN website.

Available data on changes in abundance and distribution of native species are presented in indicators D4 Relative abundance and/or distribution of widespread species, D6 Relative abundance and/or distribution of priority species and D7 Species supporting ecosystem functions.

D6 Relative abundance and distribution of priority species in England

Short description

Priority Species are those identified as the most threatened or declining species in the UK. They were identified to support UK conservation planning and are published and maintained by the Joint Nature Conservation Committee. Priority species are used as the reference source to produce statutory species lists of principal conservation importance. Such lists are published by the Secretary of State under Section 41 of the Natural Environment and Rural Communities Act 2006. There are over 940 priority species recognised in England.

This indicator has 2 components: (a) changes in the relative abundance of those priority species for which suitable abundance data are available; and, (b) changes in distribution (the number of 1 km grid squares in which species are recorded in any given year) of those priority species for which distribution data are available.

The taxonomic coverage of this indicator is limited at present. The relative abundance measure includes priority birds, butterflies, some mammals (one hare and 5 bats) and moths but does not currently include plants, fungi, amphibians, reptiles, fish or

invertebrates other than butterflies and moths; the distribution measure includes priority species of bryophytes, lichens, insects and other invertebrates but does not currently include amphibians, reptiles, birds, fish or mammals.

Relevant goal in the 25 Year Environment Plan

- Thriving plants and wildlife

Relevant target in the 25 Year Environment Plan

- Taking action to recover threatened, iconic or economically important species of animals, plants and fungi, and where possible to prevent human-induced extinction or loss of known threatened species in England and the Overseas Territories

Position in the natural capital framework

Condition of asset – species and ecological communities

Related reporting commitments

- Relevant to Convention on Biological Diversity
- Sustainable Development Goal 15 Life on Land

Geographical scope

England

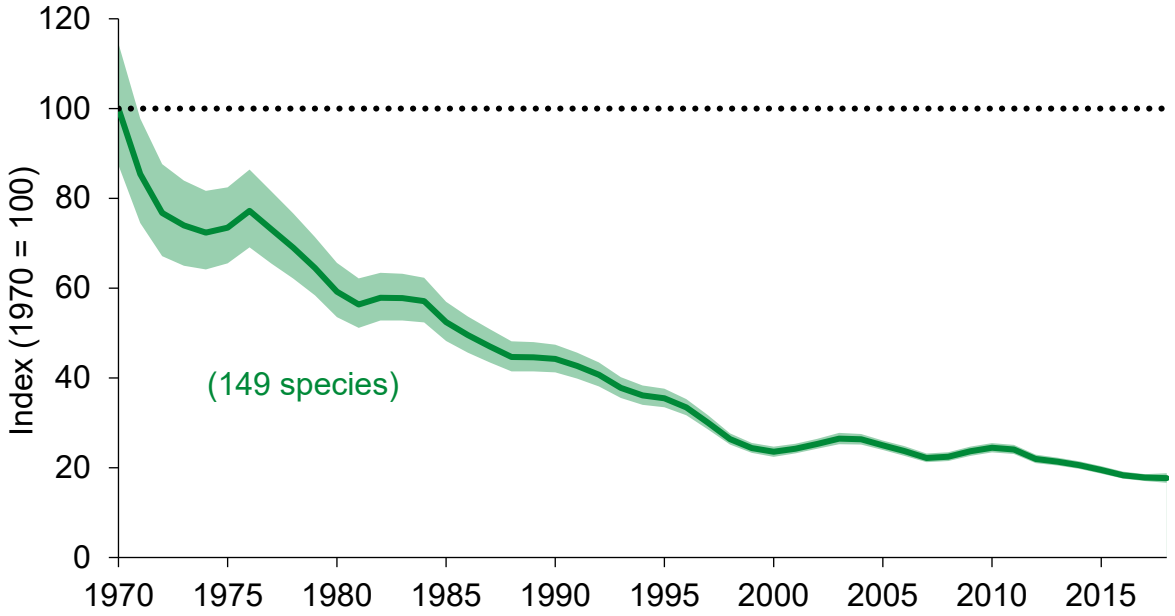
Status of indicator development

Interim

Readiness and links to data

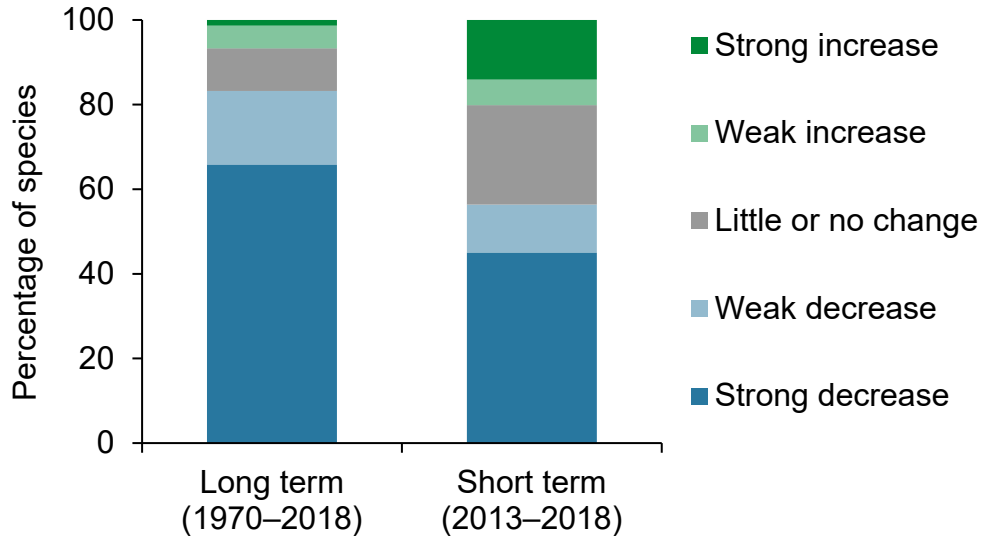
This indicator is not available for reporting in 2021 in a finalised form. Trends for the relative abundance and distribution of priority species at a UK-level are already presented annually in the UK Biodiversity Indicators; however, further work has been undertaken to develop equivalent measures at an England-only level. The results of this work are presented here for the first time in 2021 as a revised interim indicator. Information on how these data have been obtained and how the statistics have been calculated is available on the Defra science portal. The report includes a technical background document that describes the data sources and methods in detail, and spreadsheets that contain a list of species within each index together with the data behind the indices. Methods are being developed to refine the future reporting of this indicator and to expand the taxonomic coverage. These methods are still undergoing peer review and user feedback is invited via 25YEPindicators@defra.gov.uk.

Figure D6ai (interim), Relative abundance of priority species in England, 1970 to 2018



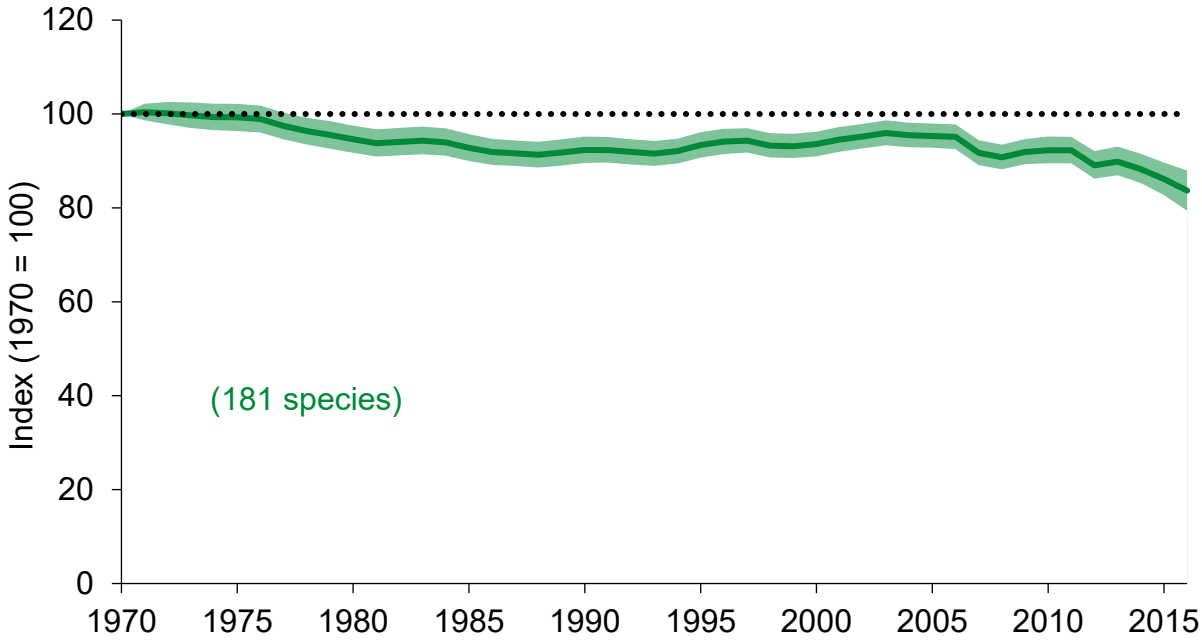
Source, Bat Conservation Trust; British Trust for Ornithology; Butterfly Conservation; Defra; Joint Nature Conservation Committee; People's Trust for Endangered Species; Rothamsted Research; Royal Society for the Protection of Birds; UK Centre for Ecology & Hydrology

Figure D6aii (interim), Long-term and short-term changes in the relative abundance of individual priority species in England, 1970 to 2018



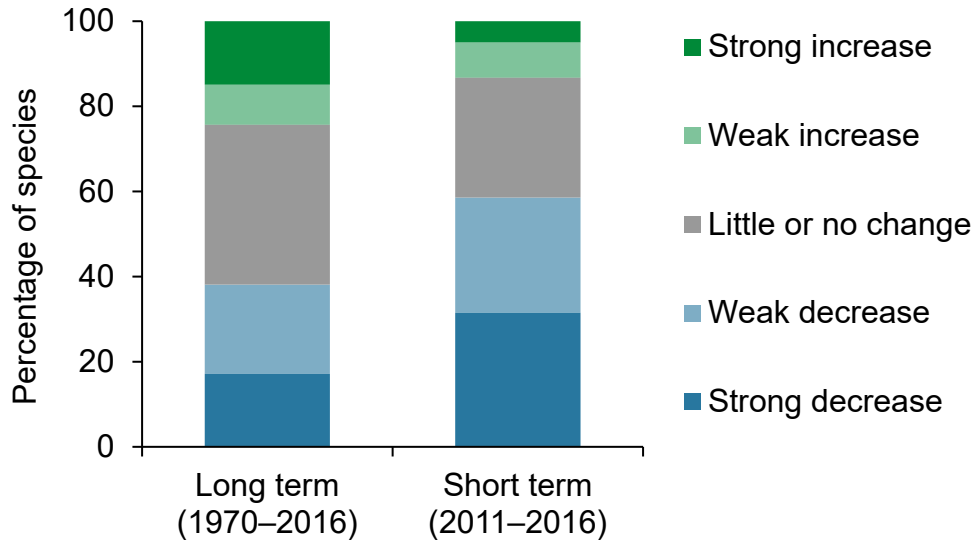
Source, Bat Conservation Trust; British Trust for Ornithology; Butterfly Conservation; Defra; Joint Nature Conservation Committee; People's Trust for Endangered Species; Rothamsted Research; Royal Society for the Protection of Birds; UK Centre for Ecology & Hydrology

Figure D6bi (interim), Distribution of priority species in England, 1970 to 2016



Source, Biological records data collated by a range of national schemes and analysed by the UK Centre for Ecology & Hydrology

Figure D6bii (interim), Long-term and short-term changes in the distribution of individual priority species in England, 1970 to 2016



Source, Biological records data collated by a range of national schemes and analysed by the UK Centre for Ecology & Hydrology

Note

The shaded areas on the line graphs represent the 95% credible intervals (measures of uncertainty) for the smoothed relative abundance and distribution indices. The narrowing

credible interval around the abundance index reflects growing confidence in the estimate of the annual results; the incorporation of bat data in the late 1990s; and the falling index values over time. The numbers in brackets show the number of species included within each composite measure.

Of the more than 940 species in the priority species list for England, 149 have robust quantitative time-series data on relative abundance and 181 have suitable distribution data. The relative abundance measure comprises Birds (44), Butterflies (21), Mammals (6) and Moths (78); the distribution measure includes Bees (13), Bryophytes (9), Lichens (16), Moths (93), Spiders, (9) and Wasps (7). Approximately 60 species of moths appear in both the relative abundance and distribution measures; the remaining species within this indicator are unique to one or other of the measures because they are drawn from different data sources. The abundance datasets are generated largely from data collected by national monitoring schemes, whereas the distribution data are collated through the Biological Records Centre and include contributions from a wide range of national recording schemes (see the technical background document referenced in the 'Readiness and links to data' section for further detail).

Composite indices mask individual species trends, therefore, the bar charts are included to show the number of priority species included within each measure that have increased, decreased or displayed little or no overall change in their relative abundance and/or distribution over 2 time periods, (i) long term (since the time series began in 1970) and (ii) short term (latest 5 years of the time series).

Trend description

a) Changes in abundance of priority species

By 2018, the index of relative abundance of priority species in England had declined to 17.7% of its base-line value in 1970, a statistically significant decrease. Over this long-term period, 7% of species showed a strong or weak increase and 83% showed a strong or weak decline. More recently, between 2013 and 2018, the relative abundance index declined from 21.3 to 17.7 (17% of the 2013 value), again a statistically significant decrease. Over this short-term period, 20% of species showed a strong or weak increase and 56% showed a strong or weak decline.

b) Changes in distribution of priority species

By 2016, the index of distribution of priority species in England decreased to 84, a statistically significant decrease of 16% of the 1970 value. Over this long-term period, 24% of species showed a strong or weak increase and 38% showed a strong or weak decline. More recently, between 2011 and 2016, the distribution index declined from 92.3 to 83.7 (9% of the 2011 value), again a statistically significant decrease. Over this short-term period, 13% of species showed a strong or weak increase and 59% showed a strong or weak decline.

D7 Species supporting ecosystem functions

Short description

All species have a functional role within ecosystems such as photosynthesis, respiration, decomposition, nutrient cycling, predator-prey and symbiotic relationships such as pollination. Plants, fungi, algae, invertebrates and soil micro-organisms are particularly important. The presence, abundance and diversity of species are key factors in determining the resilience of ecosystems to environmental changes, including climate change and disease, and the maintenance of ecosystem services. Further research is required to develop this indicator, building on the existing UK pollinator indicator and defining species groups and functions for inclusion.

Relevant goal in the 25 Year Environment Plan

- Thriving plants and wildlife

Relevant target in the 25 Year Environment Plan

- Taking action to recover threatened, iconic or economically important species of animals, plants and fungi, and where possible to prevent human-induced extinction or loss of known threatened species in England and the Overseas Territories

Position in the natural capital framework

Condition of asset – species and ecological communities

Related reporting commitments

- Relevant to Convention on Biological Diversity Aichi
- May also provide evidence in support of Climate Change Risk Assessment under the Climate Change Act (2008)

Geographical scope

England. The interim indicator is only available for the UK.

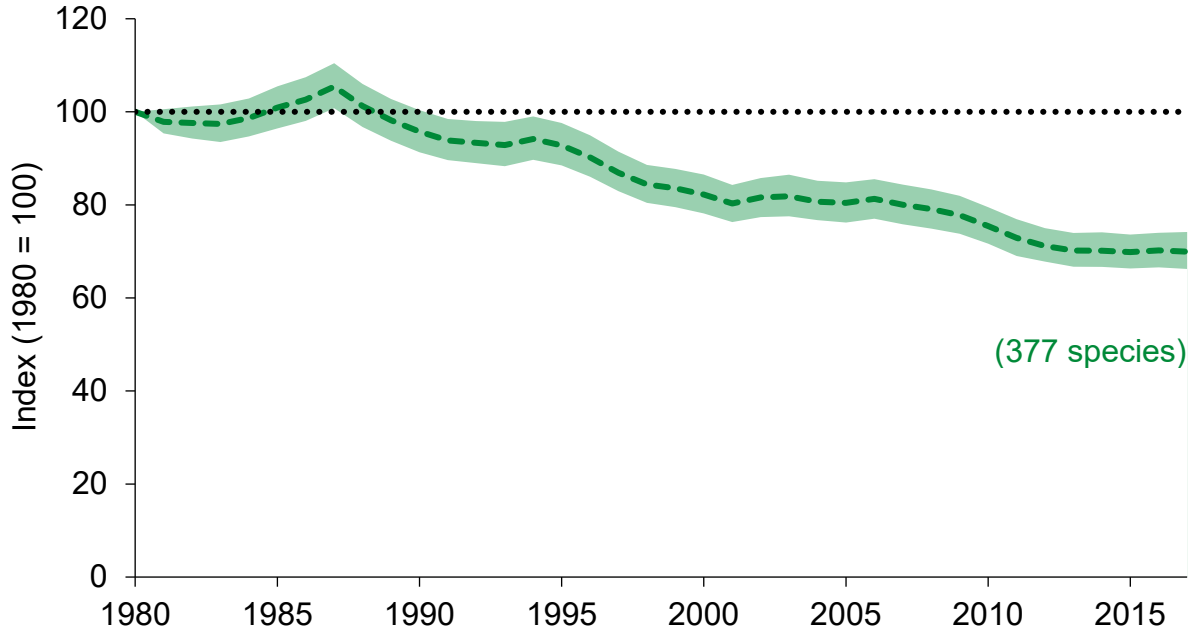
Status of indicator development

Interim

Readiness and links to data

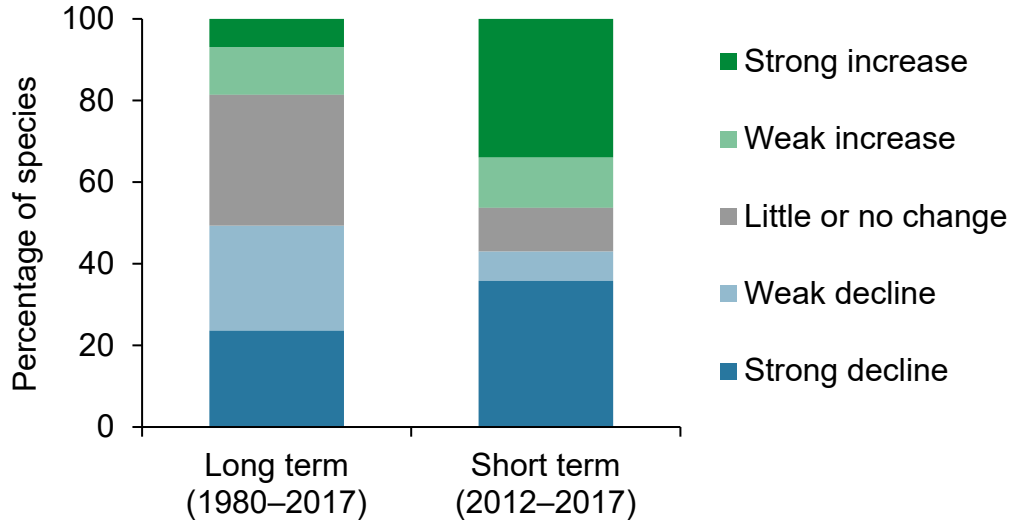
This indicator is not available for reporting in 2021 in a finalised form. An interim indicator is presented here that shows trends in the distribution of UK pollinators. Significant further research and development is required to include a range of species groups important for supporting ecosystem functions in England. The interim indicator covers the changes in the distribution (occupancy of 1 km grid squares) of bees and hoverflies in the UK.

Figure D7i (interim), Change in the distribution of pollinators in the UK, 1980 to 2017



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

Figure D7ii (interim), Long-term and short-term changes in the distribution of individual pollinator species in the UK, 1980 to 2017



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

Note

The line graph shows the unsmoothed composite indicator trend (dashed line); the shaded area represents the 90% credible interval (measure of uncertainty) for this trend. The figure in brackets shows the total number of species included in the index (148 wild bee and 229 hoverfly species); the number of species can vary between years and hence this indicator may not be directly comparable to those appearing in previous publications. Composite indices mask individual species trends therefore the bar chart shows the percentage of species within the indicator that have increased, decreased or shown little or no change in occupancy, based on set thresholds of change over the long term (since the time series began in 1980) and short term (latest 5 years).

Trend description

There was an overall decrease in the UK pollinators index from 1987 onwards. In 2017, the index had declined by 30% compared to its value in 1980. More recently however, this downward trend has slowed, with the indicator decreasing by less than 2% between 2012 and 2017. These overall declines mask the trends of the individual species within the index, 49% of which have become less widespread, 19% of which have become more widespread and 32% of which have shown little or no change since the index began in 1980. By contrast, over the short term (between 2012 and 2017), a slightly greater proportion of species have become more widespread (46%) than have become less widespread (43%).

Theme E: Natural Resources

E1 Area of productive agricultural land

Short description

Agriculture provides around 75% of the indigenous[1] food we eat and accounts for around 70% of land use. As well as being vital for food production, agriculture helps to shape the landscape, providing important recreational, spiritual and other cultural benefits. This indicator shows annual changes in land used for agriculture in 3 categories: grassland (including sole rough grazing); crops (including horticulture and perennial crops); and uncropped arable (land left fallow or under environmental management). Agricultural

[1] Food which can be produced in the climatic conditions of the UK.

production and the associated land use and management are key drivers of the environmental impacts from the sector. A key policy challenge is to de-couple production from environmental impact. The indicator may be considered a measure of pressure on the environment, a measure of condition of the land asset, or a measure of service/benefit we derive from the land. The indicator is included in the framework to provide contextual information.

Relevant goal in the 25 Year Environment Plan

- Using resources from nature more sustainably and efficiently

Relevant target in the 25 Year Environment Plan

- Ensuring that food is produced sustainably and profitably

Position in the natural capital framework

Condition of asset – land

Related reporting commitments

- None

Geographical scope

England

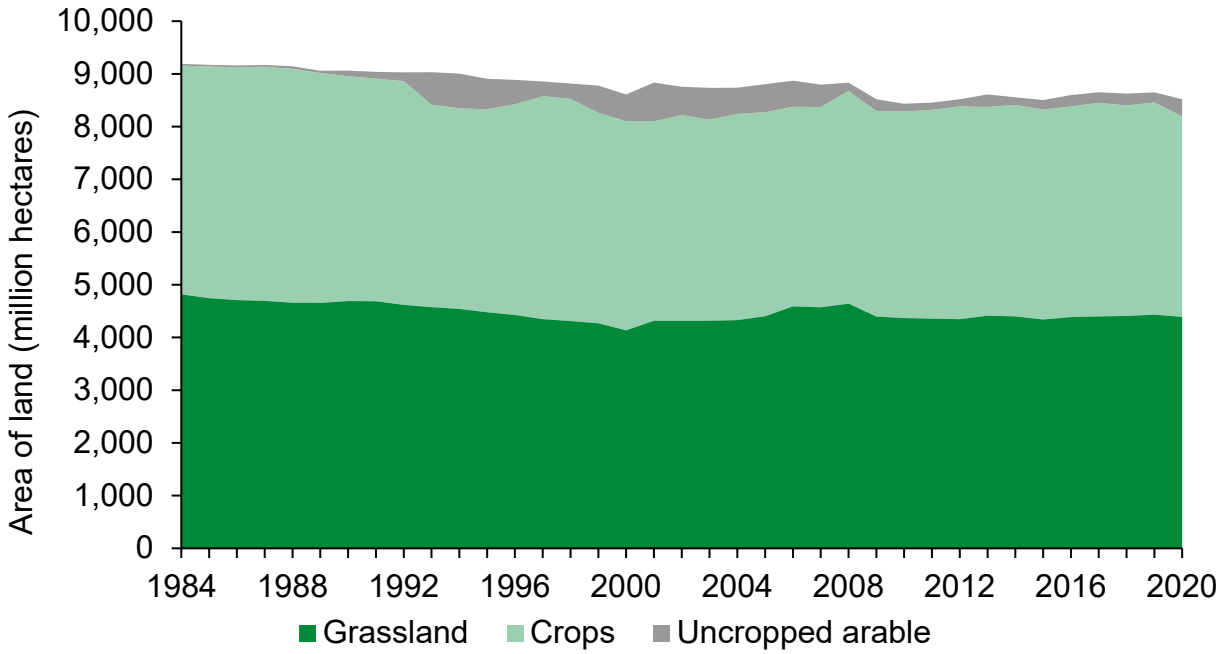
Status of indicator development

Final

Readiness and links to data

Data on the structure of the agricultural industry in England are already published annually as National Statistics.

Figure E1, Area of productive agricultural land in England, 1984 to 2020



Source, Defra

Trend description

After a period of decline in the late 1980s, land use by agriculture has remained relatively stable. Similarly, the split between crops and grazing has remained relatively constant over this time, with grassland accounting for around half of agricultural land (52% in 2020) and crops a little under half (45% in 2020).

E2 Volume of agricultural production

Short description

Farming produces a range of food, feed and fibre commodities. This represents a valuable output from the land and other resources used. Volume of agricultural production is considered to be a provisioning service provided by a range of natural capital assets (land, water, air, species and ecological communities). This indicator shows annual changes in the index of output volume which provides an overall measure of total production across the wide range of agricultural commodities. The index is calculated using agreed international standards. Farm practices and the use of inputs (particularly fertilisers and pesticides) directly influence the environmental pressures from farming including the quality, composition and availability of habitats and impact on air, water and soils. This indicator should therefore be viewed alongside the indicator E3 Volume of inputs used in

agricultural production and other indicators in the framework relating to the condition of natural capital assets.

Relevant goal in the 25 Year Environment Plan

- Using resources from nature more sustainably and efficiently

Relevant target in the 25 Year Environment Plan

- Ensuring that food is produced sustainably and profitably

Position in the natural capital framework

Service or benefit associated with natural capital asset

Related reporting commitments

- None

Geographical scope

England. The interim indicator is only available for the UK.

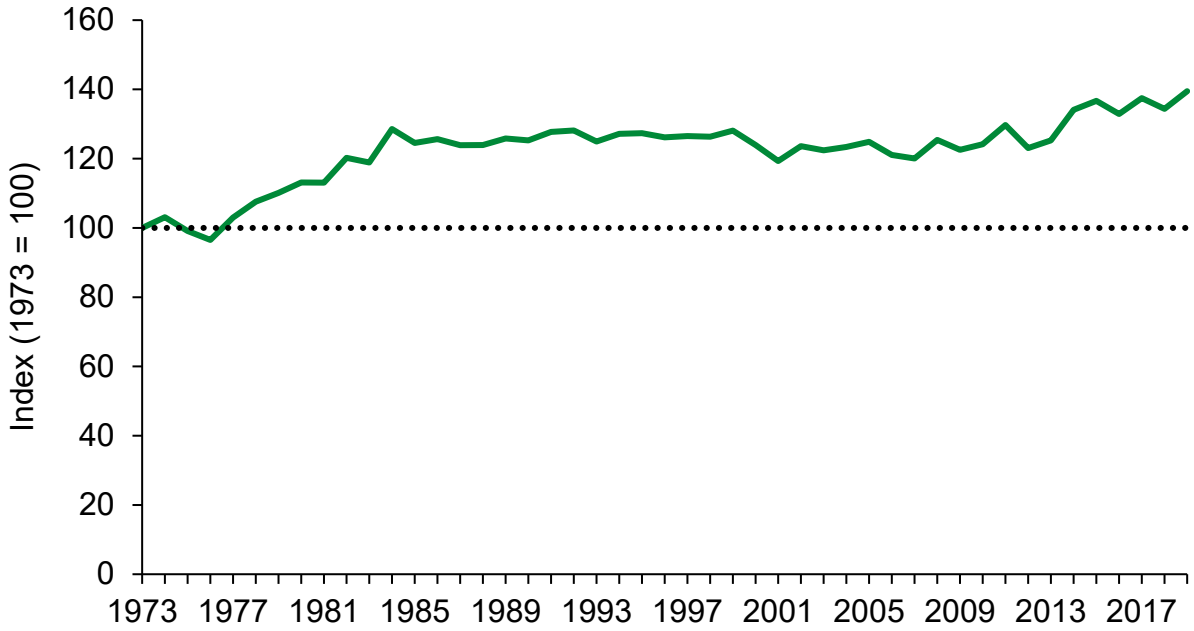
Status of indicator development

Interim

Readiness and links to data

This indicator is not available for reporting in 2021 in a finalised form. An interim indicator is presented here that shows the volume of agricultural production in the UK. Indicators and data on total factor productivity for England by farm type are published as Experimental Statistics, but the National Statistics publication on total factor productivity of the agricultural industry in the UK is considered to be a more reliable source for this indicator until the England-level data receive accreditation as National Statistics.

Figure E2 (interim), Volume of agricultural production in the UK, 1973 to 2019



Source, Defra

Trend description

After a period of sustained increase from the late 1970s to the mid-1980s the overall volume of agricultural production (outputs) in the UK has remained relatively stable, with some variation from year to year. Annual variations are generally driven by external factors, in particular weather, affecting growing and harvest and the variation in cropping driven by prices.

E3 Volume of inputs used in agricultural production

Short description

To produce food and feed, farming uses a range of inputs including fertilisers, pesticides, energy and animal feed. In addition, labour and land is required as well as depreciation of capital. Minimising the use of these inputs is an important policy driver to improve productivity and hence improve profitability whilst reducing the environmental impacts of farming. Farm practices and the use of inputs (particularly fertilisers and pesticides) directly influence the environmental pressures from farming including the quality, composition and availability of habitats and impact on air, water and soils. Volume of inputs may therefore be considered an indirect measure of pressure on a range of natural capital assets. This indicator should be viewed alongside the indicator E2 Volume of agricultural production and other indicators in the framework relating to the condition of natural capital assets. The index of the volume of inputs is an overall measure of the total

inputs used with price effects removed. This includes all inputs including intermediate consumption, land, labour and depreciation of capital.

Relevant goal in the 25 Year Environment Plan

- Using resources from nature more sustainably and efficiently

Relevant target in the 25 Year Environment Plan

- Ensuring that food is produced sustainably and profitably

Position in the natural capital framework

Pressure on natural capital assets

Related reporting commitments

- None

Geographical scope

England. The interim indicator is only available for the UK.

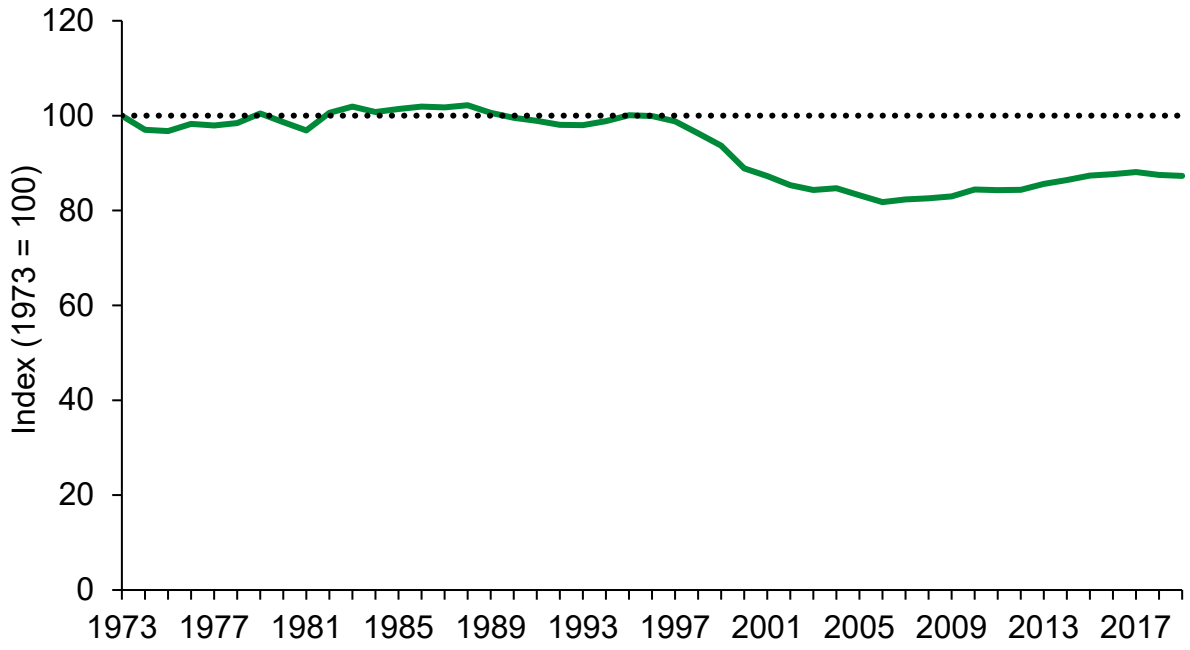
Status of indicator development

Interim

Readiness and links to data

This indicator is not available for reporting in 2021 in a finalised form. An interim indicator is presented here that shows the volume of inputs used in agricultural production in the UK. Indicators and data on total factor productivity for England by farm type are published as Experimental Statistics, but the National Statistics publication on total factor productivity of the agricultural industry in the UK is considered to be a more reliable source for this indicator until the England-level data receive accreditation as National Statistics.

Figure E3 (interim), Volume of inputs used in agricultural production in the UK, 1973 to 2019



Source, Defra

Trend description

The index of volume of inputs used in agricultural production in the UK has shown an overall decline since 1973. Most of this decline took place between the late 1990s and 2006 and since then there has been a slight increase in the volume of inputs used in agricultural production. The volume remains below historical levels.

E4 Efficiency of agricultural production measured by Total Factor Productivity

Short description

Total factor productivity is a well-established index of how efficiently farming inputs (such as fertilisers, labour) are converted into outputs (such as wheat, milk) giving an indication of changes in the efficiency and competitiveness of the agriculture industry. It is based on the ratio of inputs (indicator E3 Volume of inputs used in agricultural production) to outputs (indicator E2 Volume of agricultural production) such that the higher the value, the more efficiently inputs are converted into outputs. Data are based on volumes rather than values so that price effects are removed. The measure is known as Total Factor Productivity as it takes into account all output and input factors, including land, labour, intermediate consumption and depreciation of capital.

Relevant goal in the 25 Year Environment Plan

- Using resources from nature more sustainably and efficiently

Relevant target in the 25 Year Environment Plan

- Ensuring that food is produced sustainably and profitably

Position in the natural capital framework

Service or benefit associated with natural capital asset

Related reporting commitments

- None

Geographical scope

England. The interim indicator is only available for the UK.

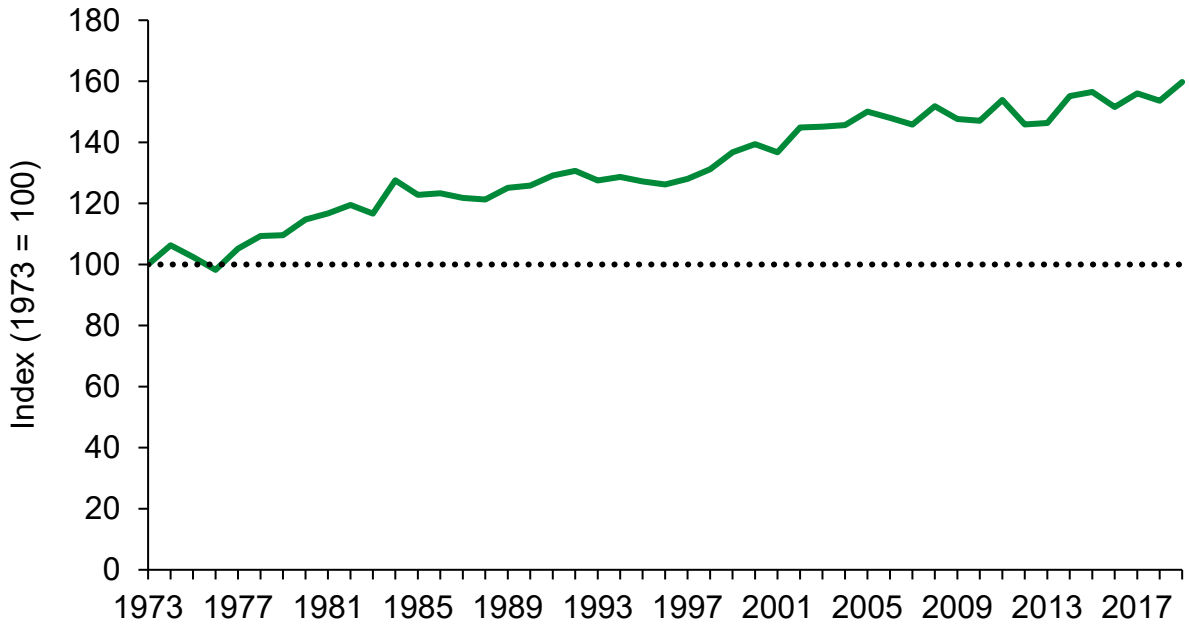
Status of indicator development

Interim

Readiness and links to data

This indicator is not available for reporting in 2021 in a finalised form. An interim indicator is presented here that shows the total factor productivity for the UK. Indicators and data on total factor productivity for England by farm type are published as Experimental Statistics, but the National Statistics publication on total factor productivity of the agricultural industry in the UK is considered to be a more reliable source for this indicator until the England-level data receive accreditation as National Statistics.

Figure E4 (interim), Efficiency of agricultural production measured by Total Factor Productivity in the UK, 1973 to 2019



Source, Defra

Trend description

Overall productivity is driven by both the output and input components. Total factor productivity of the agricultural industry in the UK was 60% higher in 2019 than it was in 1973. There has been an overall long-term increase driven by both increased outputs and a fall in inputs, although the separate trends (see indicators E2 and E3) have followed different patterns. There is considerable annual variation, this variation being mainly driven by variation in output volumes.

E5 Percentage of the annual growth of trees in English woodlands that is harvested

Short description

This indicator shows changes in the percentage of annual softwood and hardwood growth in England that is harvested annually. Separate statistics are available for softwood, hardwood, and both in total. This indicator helps us to better understand the levels of, and trends in, the economic productive utilisation of English timber resources as a part of sustainable forest management policies and practices. The underlying data sources are National Statistics from Forest Research on UK Wood Production and Trade and National Forest Inventory forecasts of increase (increment) in the volume of wood that grows in England.

Relevant goal in the 25 Year Environment Plan

- Using resources from nature more sustainably and efficiently

Relevant target in the 25 Year Environment Plan

- Increasing timber supplies

Position in the natural capital framework

Service or benefit associated with natural capital asset

Related reporting commitments

- The component statistics that make up this indicator are provided, at UK level, to Forest Europe for reporting to the Ministerial Conference on the Protection of Forests in Europe and publication in the State of Europe's Forests

Geographical scope

England

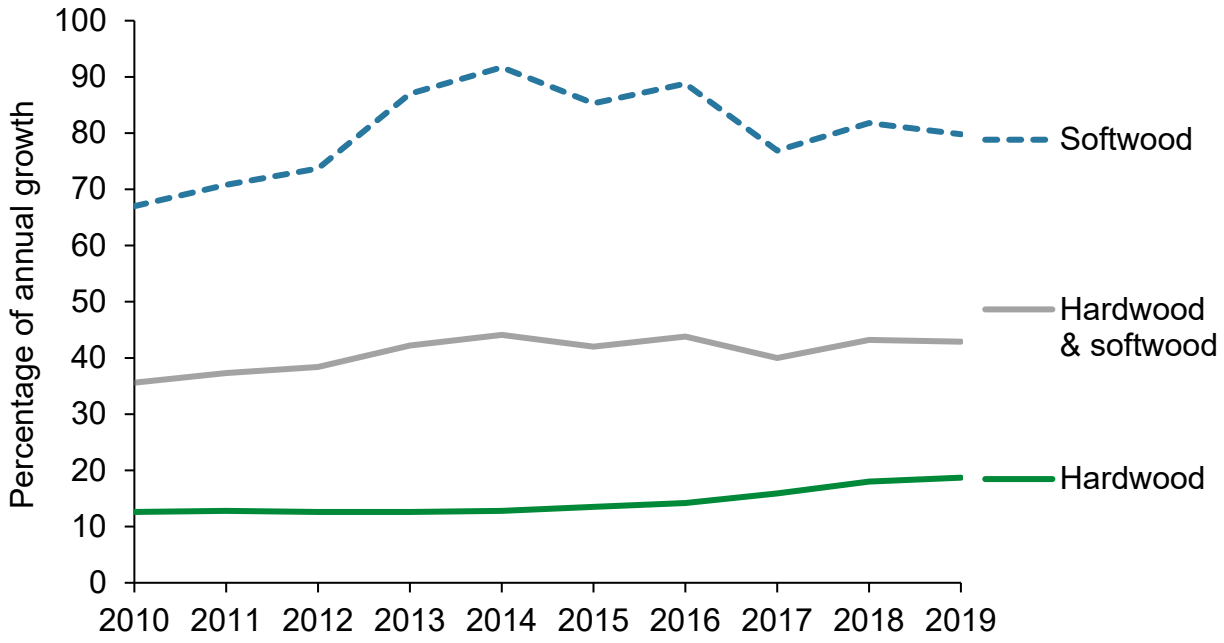
Status of indicator development

Final

Readiness and links to data

Data are already published in the Forestry Commission's annual Key Performance Indicators report.

Figure E5, Percentage of the annual growth of trees in English woodlands that is harvested, 2010 to 2019



Source, Forestry Commission; Forest Research

Note

Figures for 2010 to 2018 have been revised to reflect late updates to administrative or survey data.

Trend description

The percentage of softwood growth in England which is harvested has fluctuated between 67% and 92% over the 10 years for which these data are reported, reflecting sustained active management of softwood resources. The percentage of hardwood growth which is harvested has increased slightly, although it remains much lower (between 13% and 19% over the same 10-year period), reflecting a lower level of active management of broadleaved woodland for timber supplies.

E6 Volume of timber brought to market per annum from English sources

Short description

This indicator shows changes in the volume of commercial timber brought to market from woodlands in England by Forestry England from the nation's forests, and by other owners of woodland. It is a measure of the level of active management of woodland assets for economic productive purposes. The data are National Statistics from Forest Research on UK Wood Production and Trade.

Relevant goal in the 25 Year Environment Plan

- Using resources from nature more sustainably and efficiently

Relevant target in the 25 Year Environment Plan

- Increasing timber supplies

Position in the natural capital framework

Service or benefit associated with natural capital asset

Related reporting commitments

- Related statistics on total UK fellings are provided to Forest Europe for reporting to the Ministerial Conference on the Protection of Forests in Europe and publication in the State of Europe's Forests

Geographical scope

England

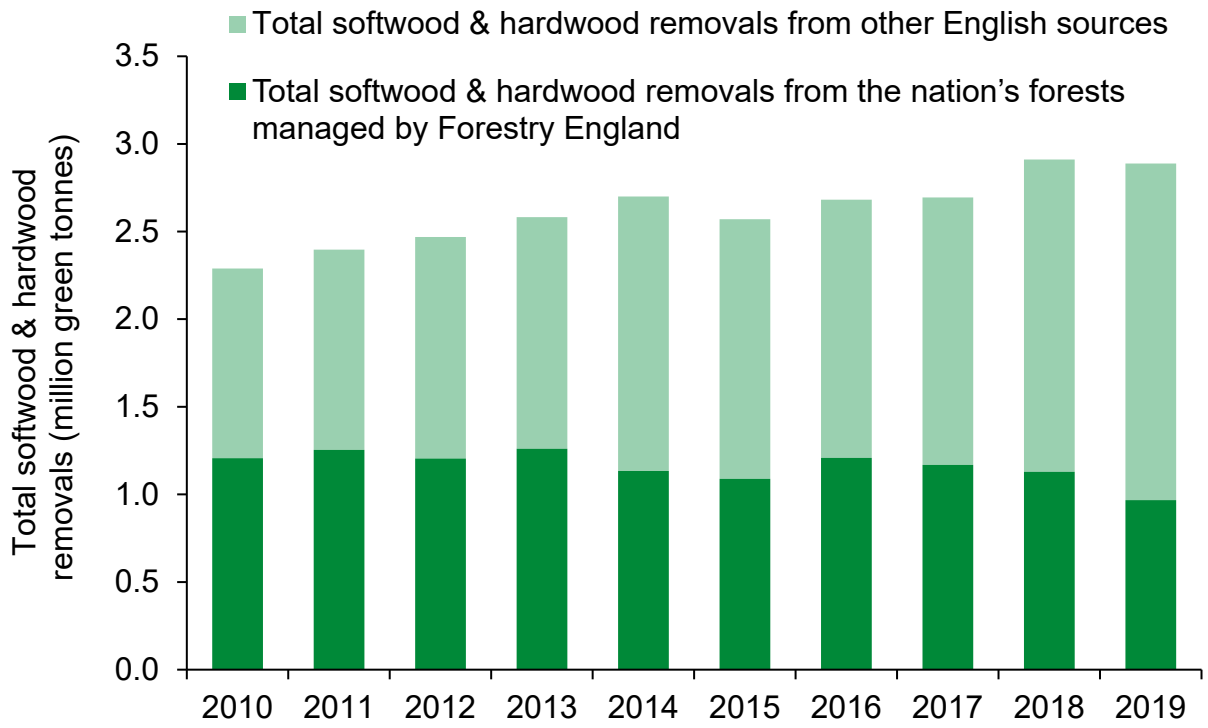
Status of indicator development

Final

Readiness and links to data

Data are already published in the Forestry Commission's annual Key Performance Indicators report.

Figure E6, Volume of timber brought to market from English sources, 2010 to 2019



Source, Forestry Commission; Forest Research

Note

Figures for 2010 to 2018 have been revised to reflect late updates to administrative or survey data.

Trend description

The total annual volume of softwood and hardwood timber brought to market in England has increased from 2.3 million green tonnes in 2010 to 2.9 million green tonnes in 2019. Total removals from the nation's forests managed by Forestry England have fallen by 20% over this period, whereas removals from other English sources have increased by 78%.

E7 Healthy soils

Short description

Healthy soils underpin the multiple functions of soils in food production, supporting wildlife, regulating water and regulating climate. More work is being done to define exactly what the indicator will include but it could include physical properties (such as a measure of soil structure), chemical properties (such as soil carbon, nutrients and pH), bare ground / soil and a measure of soil biological activity. This indicator is not limited to agricultural soils.

Further development of statistically and scientifically robust national monitoring programmes may be needed to provide data for this indicator.

Relevant goal in the 25 Year Environment Plan

- Using resources from nature more sustainably and efficiently

Relevant target in the 25 Year Environment Plan

- Improving our approach to soil management: by 2030 we want all of England's soils to be managed sustainably, and we will use natural capital thinking to develop appropriate soil metrics and management approaches

Position in the natural capital framework

Condition of asset – land

Related reporting commitments

- May provide evidence in support of Climate Change Risk Assessment under the Climate Change Act (2008)

Geographical scope

England

Status of indicator development

In development

Readiness and links to data

This indicator is not available for reporting in 2021 as significant further development work is required. Some data on aspects of soil health are already published but they do not provide a full baseline.

E8 Efficient use of water

Short description

Climate change and a growing population will put increasing pressure on our water supplies. Ambitious reductions in water consumption and leakage have a significant role in maintaining secure supplies and protecting the environment. This indicator shows changes in the efficient use of water, focussing on (a) leakage and (b) per capita consumption. Leakage and per capita household consumption of water in England are existing metrics

reported to The Water Services Regulation Authority (Ofwat) and the Environment Agency.

Relevant goals in the 25 Year Environment Plan

- Efficient and sustainable use of natural resources
- Clean and plentiful water

Relevant targets in the 25 Year Environment Plan

- Supporting Ofwat's ambitions on leakage, minimising the amount of water lost through leakage year on year, with water companies expected to reduce leakage by at least an average of 15% by 2025
- Work with the water industry to set a personal consumption target and agree cost-effective measures to meet it

Position in the natural capital framework

Service or benefit associated with natural capital asset

Related reporting commitments

- Leakage and per capita consumption figures are reported annually as part of a water company's statutory annual review of its water resources management plan
- Relevant to Sustainable Development Goals 11 and 13

Geographical scope

England, and by water company area for those with customers wholly or mainly in England.

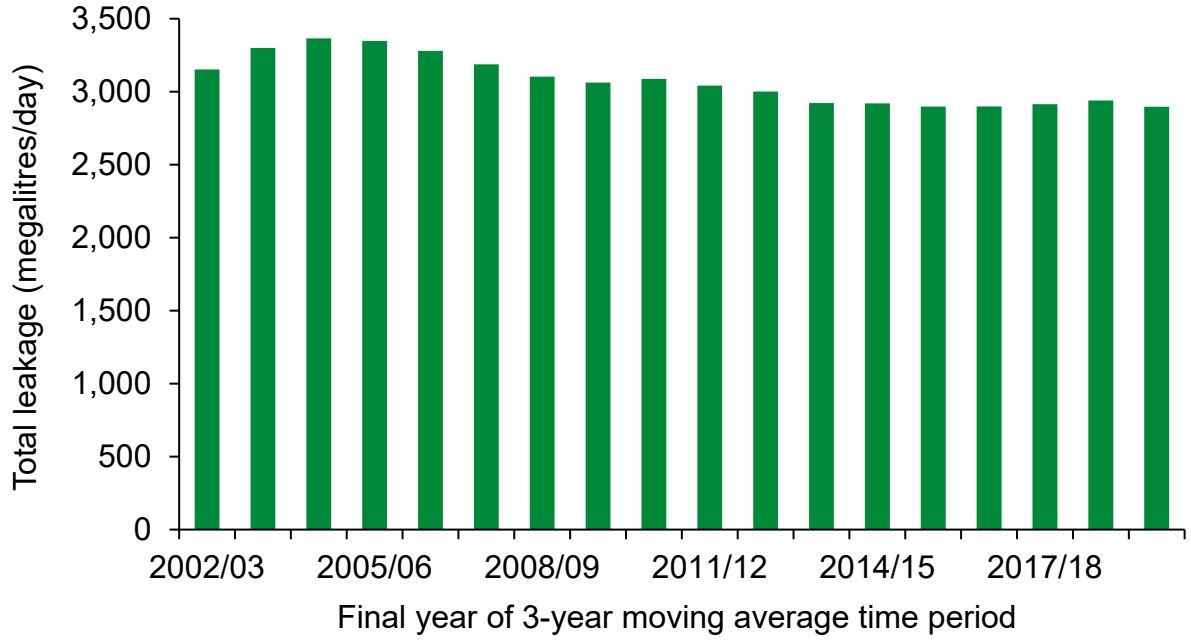
Status of indicator development

Final

Readiness and links to data

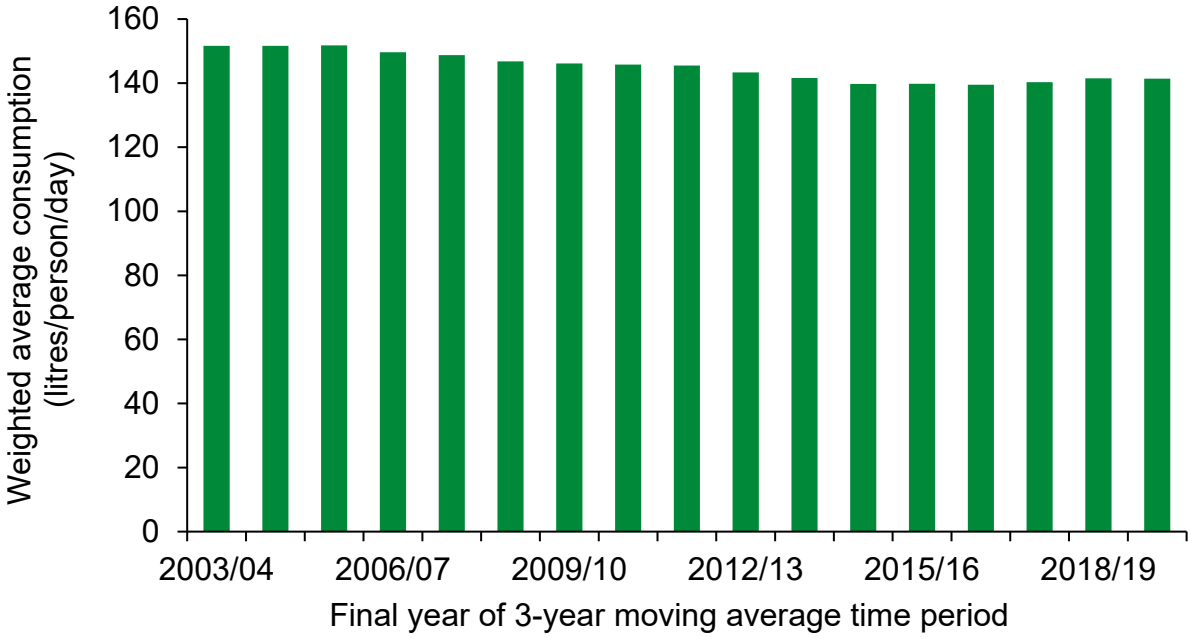
Water companies report leakage and per capita consumption figures annually. From 2020, water companies report their leakage performance against Ofwat's 2025 target, this is a 3-year average with 2017/2018 as a start point for the 3-year average.

Figure E8a, Water leakage in England, 2000/01-2002/03 to 2017/18-2019/20



Source, The Water Services Regulation Authority

Figure E8b, Per capita water consumption in England, 2000/01-2002/03 to 2017/18-2019/20



Source, The Water Services Regulation Authority

Note

Data represent figures for April to March (financial years) and are presented as 3-year moving averages. This aligns with Ofwat targets/reporting and helps to reduce sensitivity to anomalous events such as weather conditions; dates given in the charts indicate the final year of each time period.

Trend description

a) Water leakage

Between 2017/18 and 2019/20, total water leakage in England averaged 2,897 megalitres per day, 8% lower than the daily average for the 3 years from 2000/01 to 2002/03.

b) Per capita water consumption

Per capita water consumption has also fallen during the time period covered by this indicator, from an average of 152 litres per person per day in the 3 years to 2003/04 to an average of 141 litres per person per day in the most recent 3-year time period (2017/18 to 2019/20).

E9 Percentage of our seafood coming from healthy ecosystems, produced sustainably

Short description

This is a composite indicator that tracks the sustainability of seafood, fish and aquaculture products. It will combine metrics on production (covering harvesting and subsequent preparation), management and impact on the environment. The indicator will use the data collected for the management of fish stocks to assess whether harvesting rates remain within sustainable limits. It will use equivalent data for aquaculture production. These data on harvesting and production will then be integrated with data on the impact of these activities on the wider environment together with social and economic data to provide an assessment of the sustainability of our seafood.

The data for the proportion of marine fish quota stocks of UK interest exploited above or below maximum sustainable yield that were presented in this indicator in 2019 are now presented as part of indicator C10 Productive seas: fish and shellfish stocks safe and environmentally sustainable. This revision took place because the data are specific to fish and shellfish rather than reflecting the health of the marine ecosystem as a whole.

Relevant goals in the 25 Year Environment Plan

- Using resources from nature more sustainably and efficiently
- Thriving plants and wildlife

Relevant target in the 25 Year Environment Plan

- Ensuring that all fish stocks are recovered to and maintained at levels that can produce their maximum sustainable yield

Position in the natural capital framework

Service or benefit associated with natural capital asset

Related reporting commitments

- Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)
- International Council for Exploration of the Seas (ICES)
- Convention on Biological Diversity Aichi Target 4 and 6
- Relevant to Sustainable Development Goals 12 and 14

Geographical scope

UK

Status of indicator development

In development

Readiness and links to data

This indicator is not available for reporting in 2021. Data on sustainably harvested fish stocks are already published annually, however further work is required to include a wider range of fish stocks and assess their maximum sustainable yield.

Theme F: Resilience

F1 Disruption or unwanted impacts from flooding or coastal erosion

Short description

This indicator will track changes in the impacts of flooding and coastal erosion on people's lives. We continue to refine the approach to the finalisation of this indicator to ensure it aligns with the government's recent Policy Statement on Flood and Coastal Erosion Risk Management, which sets out government's commitment to develop a relevant national set of flood indicators by spring 2022, and the Environment Agency's recently updated National Flood and Coastal Erosion Risk Management (FCERM) Strategy for England.

Relevant goal in the 25 Year Environment Plan

- Reducing the risks of harm from environmental hazards

Relevant target in the 25 Year Environment Plan

- Boosting the long-term resilience of our homes, businesses and infrastructure

Position in the natural capital framework

Service/benefit

Related reporting commitments

- May provide evidence in support of Climate Change Risk Assessment under the Climate Change Act (2008)
- Relevant to Sustainable Development Goals 11 and 13

Geographical scope

England

Status of indicator development

In development

Readiness and links to data

This indicator is not available for reporting in 2021 as significant further development is required. Since the last update to the indicator framework in May 2020, the government has set out its policies to tackle flood and coastal erosion risk in the long term in the Flood and Coastal Erosion Risk Management Policy Statement. At the same time, the Environment Agency published the updated National Flood and Coastal Erosion Risk Management (FCERM) Strategy for England and recently reported progress against this in the National flood and coastal erosion risk management strategy for England action plan. We have commissioned new research to inform the development of FCERM indicators for future reporting. As part of this work we are reviewing the F1 and F2 indicators for the 25 Year Environment Plan to ensure they align with the outcomes of the policy statement and national strategy.

Although the Environment Agency does not routinely carry out economic cost analysis of all floods, it has published cost of flooding reports following the winter 2013/14 and winter 2015/16 floods. The managing flood and coastal erosion risk annual reports (from 1 April 2011) provide further context and statistics about the impacts of recent major flood events.

F2 Communities resilient to flooding and coastal erosion

Short description

This indicator will allow us to monitor trends over time to better understand the impact of our policies and take action to protect and benefit our communities to build resilience everywhere.

We continue to refine the approach being taken in the finalisation of this indicator to ensure it aligns with the government's recent Policy Statement on Flood and Coastal Erosion Risk Management, which sets out government's commitment to develop a relevant national set of flood indicators by spring 2022, and the Environment Agency's recently published the updated National Flood and Coastal Erosion Risk Management (FCERM) Strategy for England.

Relevant goal in the 25 Year Environment Plan

- Reducing the risks of harm from environmental hazards

Relevant target in the 25 Year Environment Plan

- Boosting the long-term resilience of our homes, businesses and infrastructure

Position in the natural capital framework

Service/benefit

Related reporting commitments

- May provide evidence in support of Climate Change Risk Assessments and the ASC's assessment of the National Adaptation Programme, under the Climate Change Act (2008)
- Relevant to Sustainable Development Goals 11 and 13

Geographical scope

England

Status of indicator development

In development

Readiness and links to data

This indicator is not available for reporting in 2021 as significant further development is required.

Since the last update to the indicator framework in May 2020, the government has set out its policies to tackle flood and coastal erosion risk in the long term in the Flood and Coastal Erosion Risk Management Policy Statement. At the same time, the Environment Agency published the updated National Flood and Coastal Erosion Risk Management (FCERM) Strategy for England and recently reported progress against this in the National flood and coastal erosion risk management strategy for England action plan. We have commissioned new research to inform the development of FCERM indicators for future reporting. As part of this work we are reviewing the F1 and F2 indicators for the 25 Year Environment Plan to ensure they align with the outcomes of the policy statement and national strategy.

F3 Disruption or unwanted impacts caused by drought

Short description

This indicator will focus on disruption to public water supply due to drought.

Water companies have a statutory duty to produce a water resources management plan (WRMP) and drought plan. The WRMPs, prepared, published and maintained in accordance with provisions of the Water Industry Act 1991 and regulations and directions made under it, must set out how a company intends to maintain the balance between supply and demand for water over at least the next 25 years. This includes how it will manage the increasing pressures on our water supplies from a growing population and climate change, whilst protecting the environment. Water company drought plans, also prepared, published and maintained under Water Industry Act 1991, set out the operational actions the water companies will take before, during and after a drought to maintain a secure supply of water.

This indicator will track changes in a Supply Demand Balance Index (SDBI), which will be reported by all water and sewerage companies from Summer 2022. The SDBI will be reported within annual reviews of the WRMPs and as part of the Environment Agency's Environmental Performance Assessment (EPA) report.

Relevant goal in the 25 Year Environment Plan

- Reducing the risks of harm from environmental hazards

Relevant targets in the 25 Year Environment Plan

- Ensuring interruptions to water supplies are minimised during prolonged dry weather and drought
- Boosting the long-term resilience of our homes, businesses and infrastructure

Position in the natural capital framework

Service or benefit associated with natural capital asset

Related reporting commitments

- Relevant to Sustainable Development Goals 11 and 13
- Water and sewerage companies currently provide Security of Supply Index (SoSi) data to the Environment Agency annually. This is published as part of the Environment Agency's EPA report and is part of the water companies' annual review of WRMPs

Geographical scope

England, and by water company area for those with customers wholly or mainly in England.

Status of indicator development

In development

Readiness and links to data

This indicator is not ready for reporting in 2021.

Existing SoSi data identifies whether water companies have a greater than planned risk of interruptions to public water supply during drought events. It illustrates those that need to take immediate action to increase resilience to the environmental hazard of drought. SoSi data are reported annually in the Environment Agency's annual EPA report.

We do not report on the SoSi metric here as it contains elements of prediction and, from 2022, all water and sewerage companies will report a new, improved index (SDBI) annually which will be based more firmly on actual figures. We will therefore use the SDBI as the metric for this indicator and report on it from 2023.

The SDBI measures how a company is actually able to meet water demand compared to the design drought event that is set out in the company's Water Resources Management Plan (WRMP). It will therefore be testing the theoretical risk that customers could be facing if there was a drought.

Theme G: Natural Beauty and Engagement

G1 Changes in landscape and waterscape character

Short description

This is a composite indicator of changes in landscape and waterscape character in England. It will include 3 key aspects: changes in landscape character in National Character Areas across all of England; changes in the public's perceptions of landscape character and quality; and, changes in environmental outcomes from our Designated Landscapes (National Parks and Areas of Outstanding Natural Beauty). The indicator will build on an approach that has been developed to assess the impacts of agri-environment schemes on landscape in 159 National Character Areas, including aspects such as field patterns and boundaries, traditional farm buildings, semi-natural habitats, agricultural land use, dark skies, historic features and woodland/tree cover. National Character Area profiles include Statements of Environmental Opportunity, which can be utilised to monitor changes in landscape character. Further work is required to include the consideration of waterscapes in this approach. We will also develop the ability to assess Designated Landscapes using this method, alongside an analysis of the extent and condition of Designated Landscapes monitored annually since 2013 through the Framework for Monitoring of Environmental Outcomes in Protected Landscapes dataset.

Relevant goal in the 25 Year Environment Plan

- Enhancing beauty, heritage and engagement with the natural environment

Relevant target in the 25 Year Environment Plan

- Safeguarding and enhancing the beauty of our natural scenery and improving its environmental value while being sensitive to considerations of its heritage

Position in the natural capital framework

Condition of assets – land; freshwater; marine

Related reporting commitments

- Reporting under the European Landscape Convention

Geographical scope

England

Status of indicator development

In development

Readiness and links to data

This indicator is not available for reporting in 2021. Substantial further development work is required to build on existing methods and information sources to assess changes in landscape and waterscape character.

Information on changes in the public's perceptions of landscapes is now gathered by Natural England using the People and Nature Survey for England. This new survey, which began collecting data in April 2020, builds on the Monitor of Engagement with the Natural Environment (MENE) survey. The first full year of data collection was completed at the end of March 2021; data will now be analysed, and indicators will be finalised. Initial results from 2020, together with further information on the survey methods, outputs and the full questionnaire, are available on The People and Nature Survey homepage. The People and Nature Survey team would also welcome collaboration and feedback via their user hub.

G2 Condition of heritage features including designated geological sites and scheduled monuments

Short description

This indicator consists of 2 measures that describe (a) the condition of geological and geomorphological heritage features of Sites of Special Scientific Interest (SSSIs) and (b) the condition of Scheduled Monuments. Heritage features enable us to understand how our landscapes have been formed and are an important aspect of landscape character that significantly contribute to our enjoyment and appreciation of the natural beauty. We have a particular responsibility to conserve heritage features of designated sites. The indicator uses information from SSSI condition assessments and information which supports the production of the annual Heritage at Risk Register.

All geological (including geomorphological) features designated as SSSIs have first been subject to rigorous and systematic scientific assessment leading to their selection as nationally important Geological Conservation Review (GCR) sites. There are currently 1,150 SSSIs in England designated wholly, or in part, for their geology, encompassing 1,673 features identified through the GCR. Many SSSIs contain more than one geological heritage feature.

Monuments designated as Scheduled Monuments have been recognised by the Secretary of State as being nationally important. For a monument to be considered of national importance its surviving features, above and/or below the surface of the land or sea bed, must have a particular significance that relates to its historic, traditional, architectural, artistic and/or archaeological interest. There are currently 19,848 Scheduled Monuments in England.

Relevant goal in the 25 Year Environment Plan

- Enhancing beauty, heritage and engagement with the natural environment

Relevant target in the 25 Year Environment Plan

- Safeguarding and enhancing the beauty of our natural scenery and improving its environmental value while being sensitive to considerations of its heritage

Position in the natural capital framework

Condition of assets – land; freshwater; marine

Related reporting commitments

- Reporting under the European Landscape Convention

Geographical scope

England, data for individual sites which may be presented at various geographical scales, including National Character Areas are also available.

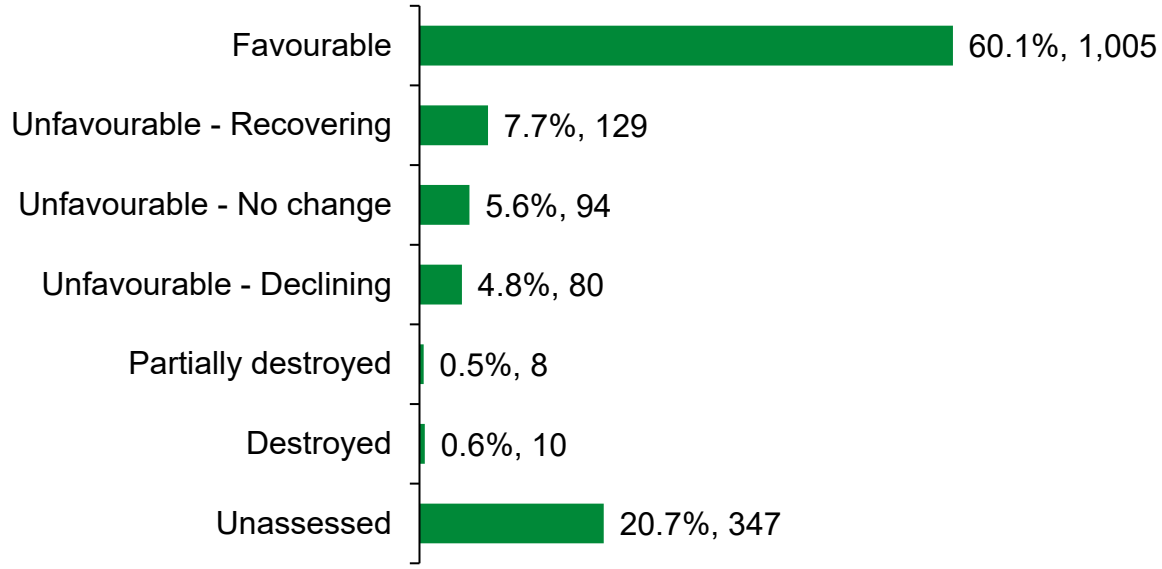
Status of indicator development

Final

Readiness and links to data

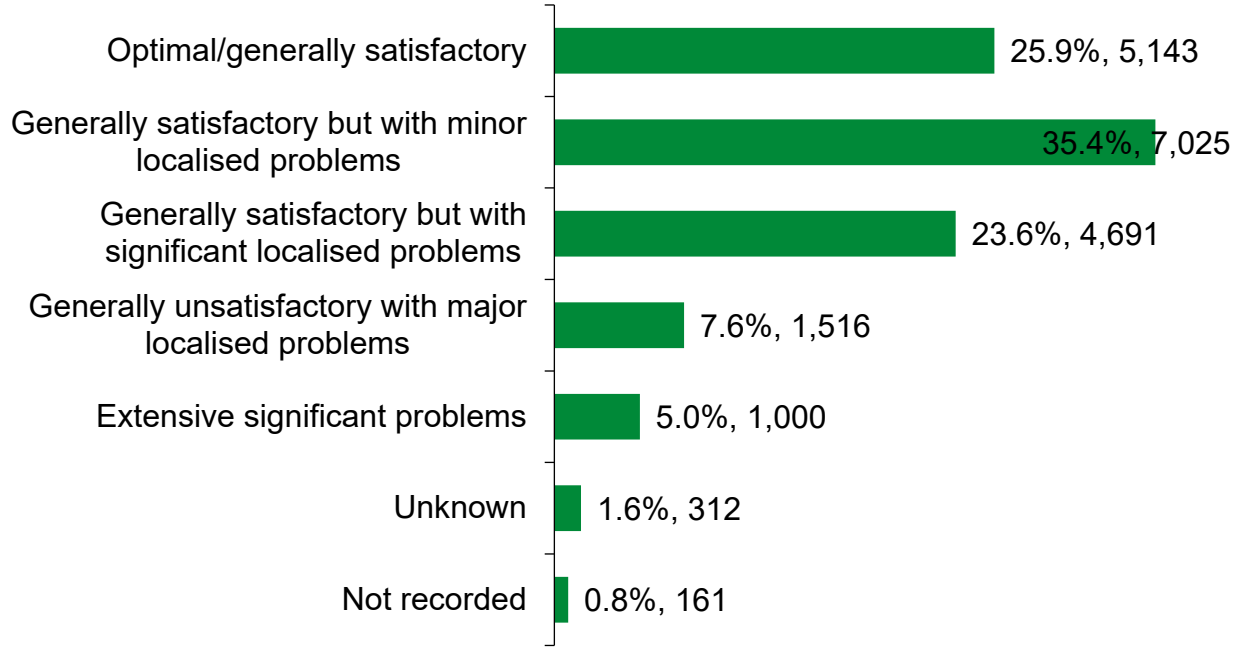
Data are available on SSSI condition assessments (as a searchable database), and also as data download of SSSI Monitored features. Data on Scheduled Monuments at risk are also available. These data have been collated over an extended time period. It is not currently possible to update them in full on a regular basis. A programme of work aimed at assessing the condition of as yet unassessed geological features and reassessing the condition of features which have not been assessed for more than 6 years, was initiated in 2020 and updated data will be reported on in 2022.

Figure G2a, Condition of geological and geomorphological heritage features of Sites of Special Scientific Interest in England, 2020



Source, Natural England

Figure G2b, Condition of Scheduled Monuments in England, 2020



Source, Historic England

Note

The data labels in Figures G2a and G2b show the percentage of sites falling into each condition category and the total number of sites within each condition category.

Figure G2a shows the condition of 1,326 geological and geomorphological heritage features that have currently been assessed with 12.3% of features being assessed since 2013 and 64.3% being assessed since 2009; 21% of features are still to be assessed.

Figure G2b shows the condition of 19,848 Scheduled Monuments; of these, 21.4% have been subject to new or updated condition assessments since 2013 and 36.6% have been assessed since 2009; 2% of features are still to be assessed.

Trend description

a) Condition of geological and geomorphological heritage features of Sites of Special Scientific Interest

In total, 60% of all designated geological features have been assessed as in favourable condition. A further 8% have been assessed as unfavourable but recovering. Approximately 1% have been destroyed or partially destroyed.

b) Condition of Scheduled Monuments

In total, 85% of all Scheduled Monuments are considered as being in optimal or generally satisfactory condition, whereas 13% are considered as either being in a generally unsatisfactory condition or having extensive significant problems.

G3 Enhancement of green/blue infrastructure

Short description

This indicator will show changes in the quantity, quality, accessibility and functioning of green and blue infrastructure. Green and blue spaces and features in and around our built environment, including within Green Belts, are essential to health and well-being. This indicator will be developed from work led by Natural England, with Defra and an advisory group, on a new national framework of standards for green and blue infrastructure. These standards aim to green our towns and cities, by improving existing green infrastructure provision and encouraging more investment. The Standards will guide stakeholders to focus on areas where we know that there is not enough accessible green infrastructure, or that what is there is of poor quality. The Standards will also guide the inclusion of accessible green space in new developments and advise the improvement of any area with little or no green space for the benefit of the community. Green and blue infrastructure can also make an important contribution towards adaptation to climate change.

Relevant goals in the 25 Year Environment Plan

- Enhancing beauty, heritage and engagement with the natural environment
- Thriving plants and wildlife

Relevant targets in the 25 Year Environment Plan

- Making sure that there are high quality, accessible, natural spaces close to where people live and work, particularly in urban areas
- Creating or restoring 500,000 hectares of wildlife-rich habitat outside the protected area network

Position in the natural capital framework

Condition of assets – land; freshwater; species and ecological communities

Related reporting commitments

- Reporting under European Landscape Convention
- Reporting on the United Nation's Sustainable Development Goals, for example Goal 11: 'Make cities and human settlements inclusive, safe, resilient and sustainable'
- May provide evidence in support of assessment against the Convention for Biological Diversity for example, draft Target 11 regarding the contribution of biodiversity and green/blue spaces to human health and wellbeing
- May provide evidence in support of Climate Change Risk Assessment and the Adaption Sub-Committee's assessment of the National Adaptation Programme, under the Climate Change Act (2008)

Geographical scope

England

Status of indicator development

In development

Readiness and links to data

This indicator is not available for reporting in 2021. However, Natural England and Defra have updated the Accessible Natural Greenspace Standards (draft) to inform the development of indicators for accessible greenspace quantity and proximity, at different scales. Further work in 2021 is planned to explore potential indicators of Green Infrastructure (GI) quality based on the attributes of GI. Natural England and Defra have also developed initial draft baseline maps of Green and Blue Infrastructure across England, for analysis using the updated Accessible Natural Greenspace Standards and other standards and indicators in development. The draft maps were trialled in areas across England from December 2020 to February 2021 and will be refined for reporting.

Information on changes in the public's perceptions of green and blue space quality and access to green and blue spaces is now gathered by Natural England using the People and Nature Survey for England. This new survey, which began collecting data in April 2020, builds on the Monitor of Engagement with the Natural Environment (MENE) survey. The first full year of data collection was completed at the end of March 2021; data will now

be analysed, and indicators will be finalised. Initial results from 2020, together with further information on the survey methods, outputs and the full questionnaire, are available on The People and Nature Survey homepage. The People and Nature Survey team also welcome collaboration and feedback via their user hub.

A new indicator, derived from the results of the People and Nature survey, should be published in the Outcome Indicator Framework report in 2022.

G4 Engagement with the natural environment

Short description

This indicator will track changes in people's engagement with the natural environment. Spending time in the natural environment improves our health and wellbeing. This indicator will measure time spent in natural spaces (woodland, parks, coasts and freshwaters, alongside other natural places), people's levels of care and concern, connection with nature and children and young people's engagement.

Relevant goal in the 25 Year Environment Plan

- Enhancing beauty, heritage and engagement with the natural environment

Relevant target in the 25 Year Environment Plan

- Making sure that there are high quality, accessible, natural spaces close to where people live and work, particularly in urban areas, and encouraging more people to spend time in them to benefit their health and wellbeing

Position in the natural capital framework

Service or benefit associated with natural capital asset

Related reporting commitments

- Relevant to Convention on Biological Diversity Aichi Target 1

Geographical scope

England

Status of indicator development

Interim

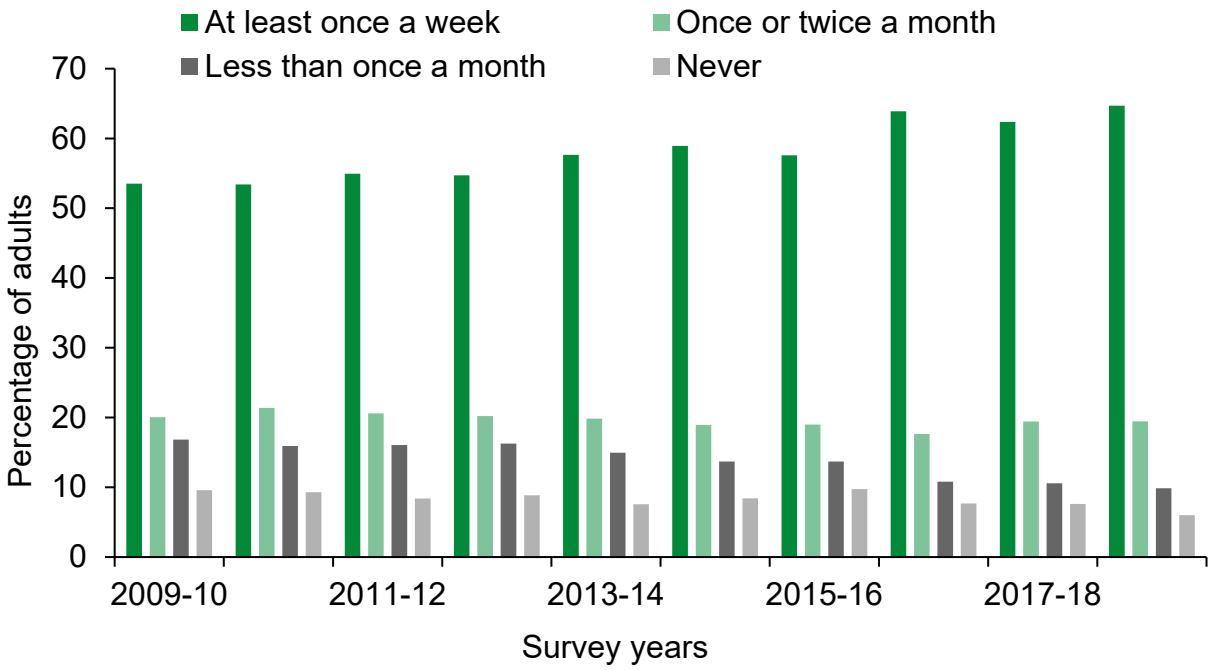
Readiness and links to data

This indicator is not available for reporting in 2021 in a finalised form. An interim indicator is presented here that shows frequency of visits to natural spaces in England. The interim indicator is derived from data collected as part of the Monitor of Engagement with the Natural Environment (MENE) survey. While the impacts of COVID-19 on public engagement with the natural environment are likely to be considerable, they are not reflected in the results of this interim indicator because the most recently available full-year data from the MENE survey predates the onset of the coronavirus pandemic.

Information on changes in public engagement with nature is now gathered by Natural England using the People and Nature Survey for England. This new survey, which began collecting data in April 2020, builds on the MENE survey. The first full year of data collection was completed at the end of March 2021; data will now be analysed, and indicators will be finalised. Initial results from 2020, together with further information on the survey methods, outputs and the full questionnaire, are available on The People and Nature Survey homepage. The People and Nature Survey team welcome collaboration and feedback via their user hub.

A revised indicator, based on results from the new People and Nature Survey, is intended to be published in the Outcome Indicator Framework report in 2022. Considerable work is underway to understand the impacts of COVID-19 on the trends for this revised indicator as part of its development; insight and feedback from stakeholders via the user hub is also welcome as part of this work.

Figure G4 (interim), Frequency of visits to the natural environment in England, 2009-10 to 2018-19



Source, Natural England

Note

Data are presented in survey years (March to February). MENE collected data using a face-to-face survey, which means the results presented here are not directly comparable to those obtained via the new People and Nature Survey which uses online methods. More information on these methodological differences and the work underway to understand, and potentially harmonise datasets is available on the Methods and limitations webpage.

Trend description

The MENE survey showed an increase in the proportion of adults visiting the natural environment at least once a week, from 54% in the survey year 2009-10 to 65% in 2018-19.

G5 People engaged in social action for the environment

Short description

This indicator will track the extent of people's social action for the environment such as environmental volunteering, participation in conservation work, environmental citizenship such as picking up litter, social action online and donations to environmental organisations. The indicator will assess how well people from all sectors of society are taking action to improve the environment.

Relevant goal in the 25 Year Environment Plan

- Enhancing beauty, heritage and engagement with the natural environment.

Relevant target in the 25 Year Environment Plan

- Focusing on increasing action to improve the environment from all sectors of society.

Position in the natural capital framework

Service or benefit associated with natural capital asset

Related reporting commitments

- None

Geographical scope

England

Status of indicator development

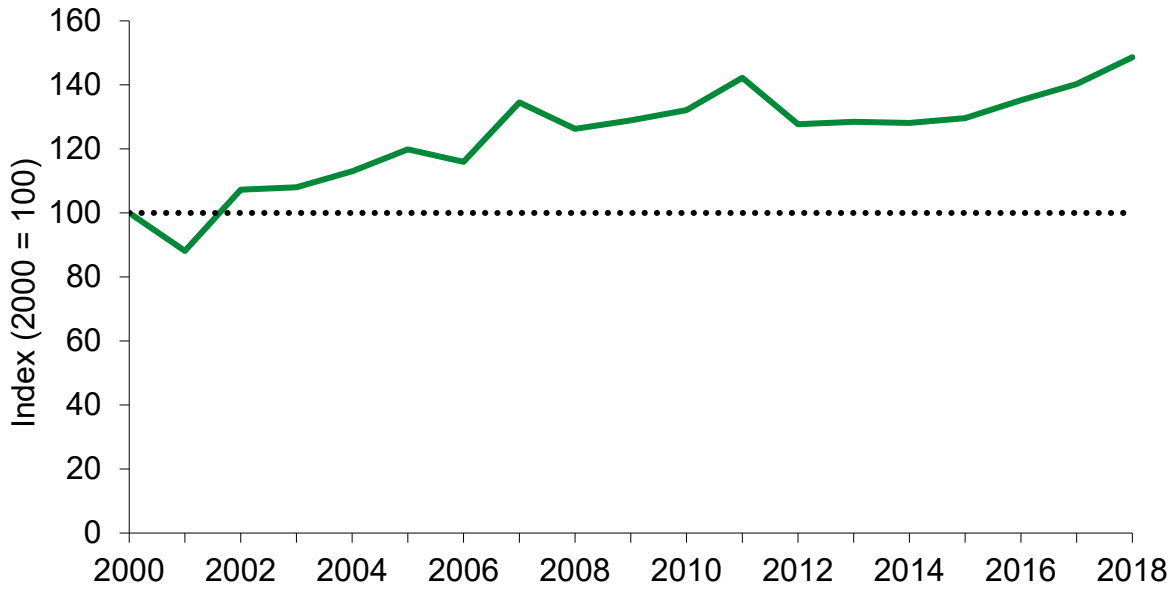
Interim

Readiness and links to data

This indicator is not available for reporting in 2021 in a finalised form. Some data on time spent volunteering are published annually as part of the England biodiversity indicators. An interim indicator based on these data is presented here; it shows volunteer time spent on activities of benefit to the natural environment in England. While the impacts of COVID-19 on the volunteer sector are likely to be considerable, they are not be reflected in the results of this interim indicator because the most recently available data from the England biodiversity indicators predate the onset of the coronavirus pandemic.

Information on changes in the social action for the environment is now gathered by Natural England using the People and Nature Survey for England. This new survey, which began collecting data in April 2020, builds on the Monitor of Engagement with the Natural Environment (MENE) survey. The first full year of data collection was completed at the end of March 2021; data will now be analysed, and indicators will be finalised. Initial results from 2020, together with further information on the survey methods, outputs and the full questionnaire, are available on The People and Nature Survey homepage. The People and Nature Survey team welcome collaboration and feedback via their user hub. The revised indicator, based on the results of the People and Nature Survey, should be published in the Outcome Indicator Framework report in 2022. Considerable work is underway to understand the impacts of COVID-19 on the trends for this revised indicator as part of its development; insight and feedback from stakeholders via the user hub is also welcome as part of this work.

Figure G5 (interim), Volunteer time spent on the natural environment in England, 2000 to 2018



Source, Bat Conservation Trust; Botanical Society of Britain & Ireland; British Trust for Ornithology; Canal & River Trust; National Parks England; Natural England; Plantlife; Royal Society for the Protection of Birds; The Conservation Volunteers; The Wildlife Trusts

Trend description

Between 2000 and 2018, the index of the amount of time contributed by environmental volunteers in England has fluctuated but overall, it has increased by 49%.

G6 Environmental attitudes and behaviours

Short description

This indicator will track changes in people's attitudes and behaviours relating to the environment, covering different sectors of the population. It will track attitudes such as willingness to change lifestyle and behaviours in key policy areas relating to sustainable use of natural resources, such as waste, water and energy. The indicator will include information on:

- Environmental attitudes including personal importance of environmental issues, ranking when compared to wider issues facing society and relative importance of environmental issues (such as climate change, litter, plastics, wildlife decline, water and air pollution);
- Pro-nature conservation behaviours;
- Wildlife gardening behaviours;
- At home environmental behaviours, including water and energy efficiency, waste and diet;
- Active travel behaviours; and,
- Behavioural intentions.

Relevant goal in the 25 Year Environment Plan

- Enhancing beauty, heritage and engagement with the natural environment.

Relevant target in the 25 Year Environment Plan

- Focusing on increasing action to improve the environment from all sectors of society.

Position in the natural capital framework

Service or benefit associated with natural capital asset

Related reporting commitments

- Relevant to Convention on Biological Diversity Aichi Target 1

Geographical scope

England

Status of indicator development

In development

Readiness and links to data

This indicator is not available for reporting in 2021. Information on changes in attitudes and behaviour is now gathered by Natural England using the People and Nature Survey for England. This new survey, which began collecting data in April 2020 builds on the Monitor of Engagement with the Natural Environment (MENE) survey. The first full year of data collection was completed at the end of March 2021; data will now be analysed, and indicators will be finalised. Initial results, together with further information on the survey methods, outputs and the full questionnaire, are available on The People and Nature Survey homepage. The People and Nature Survey team also welcome collaboration and feedback via their user hub.

A new indicator, derived from the results of the People and Nature survey, should be published in the Outcome Indicator Framework report in 2022. The evidence so far (including the People and Nature Survey monthly indicators) is showing that the coronavirus pandemic is having an impact on environmental attitudes and behaviours. Analysis is underway to better understand the trends related to this indicator. Insight and feedback from stakeholders via the user hub is also welcome as part of this work.

G7 Health and wellbeing benefits

Short description

This indicator will show changes in the health and wellbeing benefits that the natural environment provides for people. These will include benefits for mental and physical health that are gained from accessing nature, but also benefits such as improvements in air quality, climate regulation (for example urban cooling) and noise mitigation that people obtain whether they access nature or not. The indicator will track changes for people in disadvantaged groups and others who may benefit the most.

Further research on health and wellbeing benefits is in progress.

Relevant goal in the 25 Year Environment Plan

- Enhancing beauty, heritage and engagement with the natural environment

Relevant target in the 25 Year Environment Plan

- Making sure that there are high quality, accessible, natural spaces close to where people live and work, particularly in urban areas, and encouraging more people to spend time in them to benefit their health and wellbeing.

Position in the natural capital framework

Service or benefit associated with natural capital asset

Related reporting commitments

- May provide evidence in support of Climate Change Risk Assessment and the Adaptation Sub-Committee's assessment of the National Adaptation Programme, under the Climate Change Act (2008)

Geographical scope

England

Status of indicator development

In development

Readiness and links to data

This indicator is not available for reporting in 2021. Information on reported health and wellbeing outcomes from time spent in nature and nature connection, and uptake of green social prescribing, is now gathered by Natural England using the People and Nature Survey for England. This new survey, which began collecting data in April 2020 builds on the Monitor of Engagement with the Natural Environment (MENE) survey. The first full year of data collection was completed at the end of March 2021; data will now be analysed, and indicators will be finalised. Initial results together with further information on the survey methods, outputs and the full questionnaire are available on The People and Nature Survey homepage. The People and Nature Survey team would also welcome collaboration and feedback via their user hub.

A new indicator, derived from the results of the People and Nature survey, should be published in the Outcome Indicator Framework report in 2022. It is likely that the coronavirus pandemic is having an impact on environmental health and wellbeing benefits. Insight and feedback from stakeholders via the user hub is also welcome as part of this work.

Theme H: Biosecurity, Chemical and Noise

H1 Abatement of the number of invasive non-native species entering and establishing against a baseline

Short description

Biosecurity measures to prevent the establishment of invasive non-native species are a key element of protecting against their significant economic, environmental and social

impacts. This indicator will show how the number of invasive non-native species entering Great Britain has been abated (reduced) by comparing a predicted trend for establishment of invasive non-native species against actual establishment. Establishment of invasive species depends on factors such as trade and climate change. The difference to the trend in actual establishment then provides a measure of the success of biosecurity measures.

The indicator will draw on data from the Non-Native Species Information Portal, overseen by the GB Non-Native Species Secretariat, which maintains an early detection, surveillance and monitoring mechanism that facilitates management, including rapid response. This indicator requires significant development, including deciding on which species to include and establishing a baseline for the predicted and established trend.

Relevant goal in the 25 Year Environment Plan

- Enhancing biosecurity

Relevant target in the 25 Year Environment Plan

- Managing and reducing the impact of existing plant and animal diseases; lowering the risk of new ones and tackling invasive non-native species

Position in the natural capital framework

Pressure on natural capital assets

Related reporting commitments

- Convention on Biological Diversity post-2020 reporting
- May provide evidence in support of Climate Change Risk Assessments under the Climate Change Act (2008)

Geographical scope

Great Britain

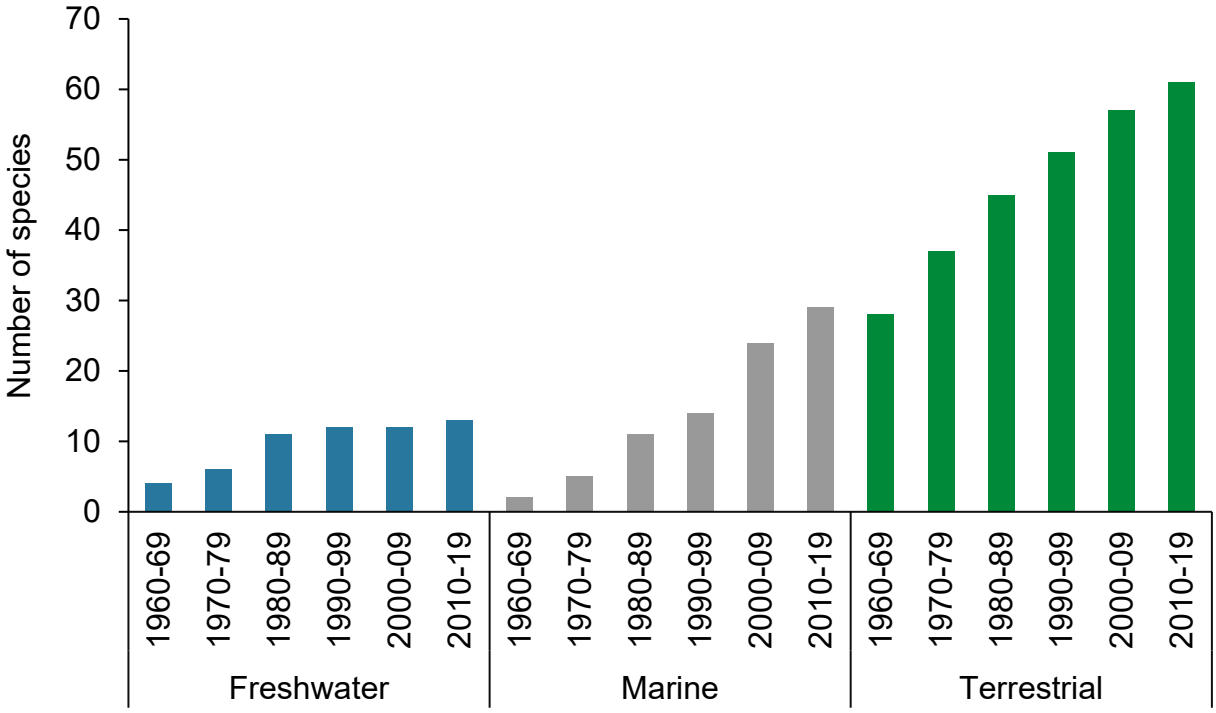
Status of indicator development

Interim

Readiness and links to data

This indicator is not available for reporting in 2021in a finalised form. An interim indicator is presented here that shows trends in the number of established non-native species in Great Britain. Further development is required to compare these data against a predicted trend.

Figure H1 (interim), Number of invasive non-native species established across or along 10% or more of the land area or coastline of Great Britain, 1960 to 2019



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

Note

The indicator shows the change in number of invasive non-native species established across or along 10% or more of the land area or coastline of Great Britain. There are 3,208 non-native species in Great Britain, 2,005 of which are classified as established (reproducing in the wild). This indicator contains 193 non-native species that are considered to be exerting a negative impact on native biodiversity (46 freshwater species, 39 marine species and 108 terrestrial species).

Trend description

Between the periods 1960 to 1969 and 2010 to 2019, the number of invasive non-native 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, with the greatest increases in numbers having been observed in the marine and terrestrial environments.

H2 Distribution of invasive non-native species and plant pests and diseases

Short description

This indicator will show changes in the distribution of non-native invasive species and plant pests that have already established in England. Preventing the spread of invasive non-native species limits their ability to disrupt ecosystems and cause economic damage. Plant pests and diseases cause significant negative impacts and it is often more difficult to prevent their entry and establishment, therefore limiting spread is critical in preventing negative impact on native species and ecosystems. This indicator will utilise distribution data for a reference subset of priority invasive species and plant pests and diseases as an indication of the success of biosecurity measures in controlling their spread.

Relevant goal in the 25 Year Environment Plan

- Enhancing biosecurity

Relevant targets in the 25 Year Environment Plan

- Managing and reducing the impact of existing plant and animal diseases; lowering the risk of new ones and tackling invasive non-native species
- Reaching the detailed goals set out in the Tree Health Resilience Strategy

Position in the natural capital framework

Pressure on natural capital assets

Related reporting commitments

- Relevant to the Convention on Biological Diversity
- May provide evidence in support of Climate Change Risk Assessments under the Climate Change Act (2008)

Geographical scope

England

Status of indicator development

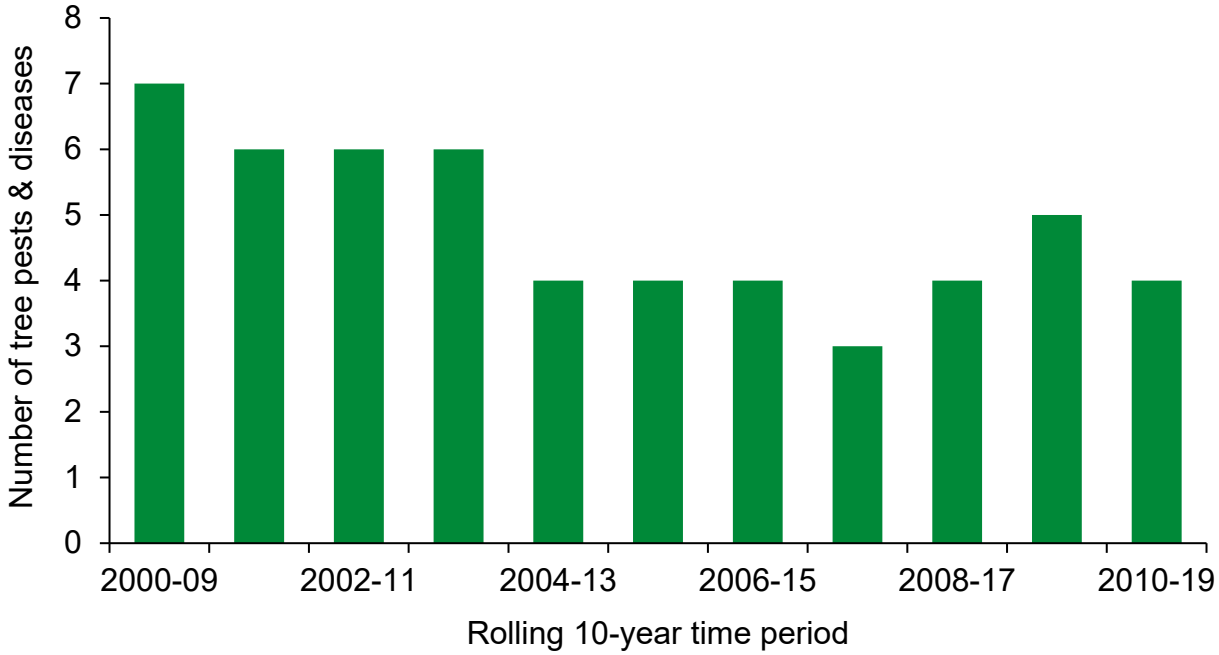
Interim

Readiness and links to data

This indicator is not available for reporting in 2021 in a finalised form. An interim indicator is presented here that shows trends in the number of additional tree pests and diseases becoming established in England since the year 2000. These data are published annually in the Forestry Commission's Key Performance Indicators Report. Further development is

required to identify species for inclusion and develop the indicator drawing on existing data.

Figure H2 (interim), Number of additional tree pests and diseases becoming established in England, 2000-09 to 2010-19



Source, Forestry Commission

Note

This indicator enumerates those additional tree pests and diseases formally considered as becoming ‘established’ by the UK Plant Health Risk Group within a rolling 10-year period. Establishment is defined as ‘perpetuation, for the foreseeable future, of a pest within an area after entry’. This is the definition produced by the Secretariat of the International Plant Protection Convention.

Trend description

The number of additional tree pests and diseases becoming established in England within a rolling 10-year period fell from a peak of 7 in 2000-09 to a low of 3 in 2007-16. It then increased again to 5 in 2009-18 before falling to 4 in 2010-19 (the most recent 10-year period for which data are available). In all, 11 tree pests and diseases became established in England in the 19 years from 2000 to 2019 and of these, the 4 to become ‘established’ between 2010 and 2019 are:

1. Chalara dieback of Ash (*Hymenoscyphus fraxineus*), considered established in 2012;
2. Oriental chestnut gall wasp, considered established in 2016;

3. Sweet chestnut blight caused by the fungus *Cryphonectria parasitica*, considered established in 2017; and
4. The Elm zigzag sawfly *(Aproceros leucopoda*), considered established in 2018, following a rapid expansion across Europe from eastern Asia.

H3 Emissions of mercury and persistent organic pollutants to the environment

Short description

This indicator shows changes in emissions of mercury and persistent organic pollutants (POPs) to air, land, and water from measured, calculated, and modelled sources.

Mercury is toxic, causes damage to human health and accumulates in the environment and the food chain. For mercury, which is covered by the Minamata Convention, combustion sources are particularly significant, and information on emissions is provided annually by larger industrial sites. Other major sources of mercury to air will be gathered from different data sources.

POPs are chemicals that are extremely persistent in the environment, become widely distributed geographically, are able to accumulate in the tissues of humans and wildlife, and have harmful impacts on human health and the environment. POPs within this indicator refers to pollutants listed under Annex C (unintentional produced) of the Stockholm Convention. The Convention covers a range of substances spanning industrial uses, pesticides, and unintentionally produced substances.

Relevant goal in the 25 Year Environment Plan

- Managing exposure to chemicals

Relevant targets in the 25 Year Environment Plan

- Seeking in particular to eliminate the use of Polychlorinated Biphenyls (PCBs) by 2025, in line with our commitments under the Stockholm Convention
- Reducing land-based emissions of mercury to air and water by 50% by 2030
- Substantially increasing the amount of Persistent Organic Pollutants (POPs) material being destroyed or irreversibly transformed by 2030, to make sure there are negligible emissions to the environment
- Fulfilling our commitments under the Stockholm Convention as outlined in the UK's most recent National Implementation Plan

Position in the natural capital framework

Pressure on natural capital asset

Related reporting commitments

- UNEP Stockholm Convention
- UNECE Convention on Long-Range Transboundary Air Pollution (CLR-TAP) via the European Monitoring and Evaluation Programme (EMEP)
- National Emission Ceilings Regulations
- UK Regulation on Pollutant Release and Transfer Registry
- The Persistent Organic Pollutants (Amendment) (EU Exit) Regulations 2020
- UNEP Minamata Convention on Mercury

Geographical scope

England; the interim indicator is currently available for the UK.

Status of indicator development

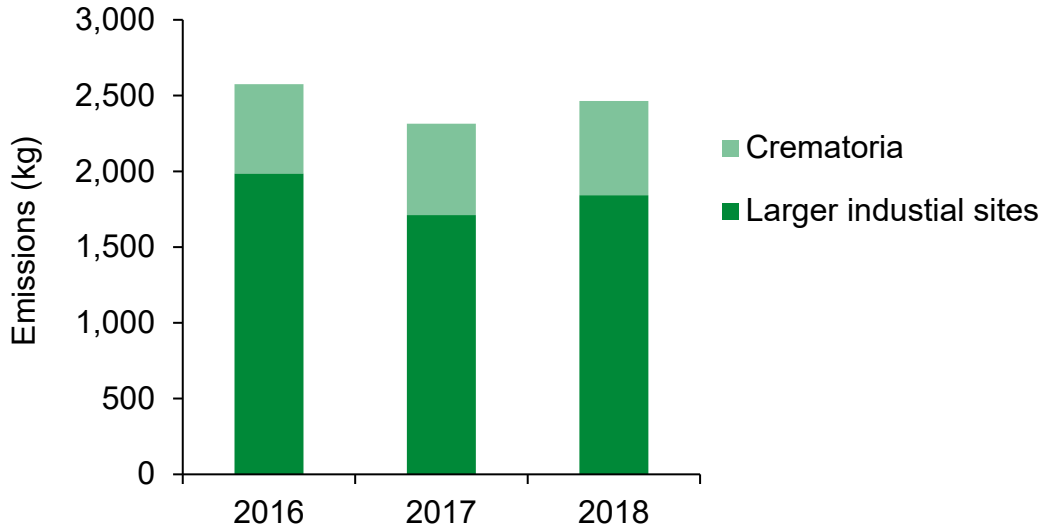
Interim

Readiness and links to data

This indicator is not available for reporting in a final format in 2021. Further development is required to bring data together from a number of different sources and further work is underway to disaggregate these data to an England-only level. An interim indicator is presented here that shows annual UK emissions of (a) mercury from larger industrial sites and crematoria, and (b) 7 unintentionally produced POP substances (as listed in the Stockholm Convention Annex C): polychlorinated biphenyls; dioxin-like polychlorinated biphenyls; dioxins and furans; hexachlorobenzene; polychlorinated naphthalenes; pentachlorophenol; and pentachlorobenzene from a wide range of sources to air, land, and water.

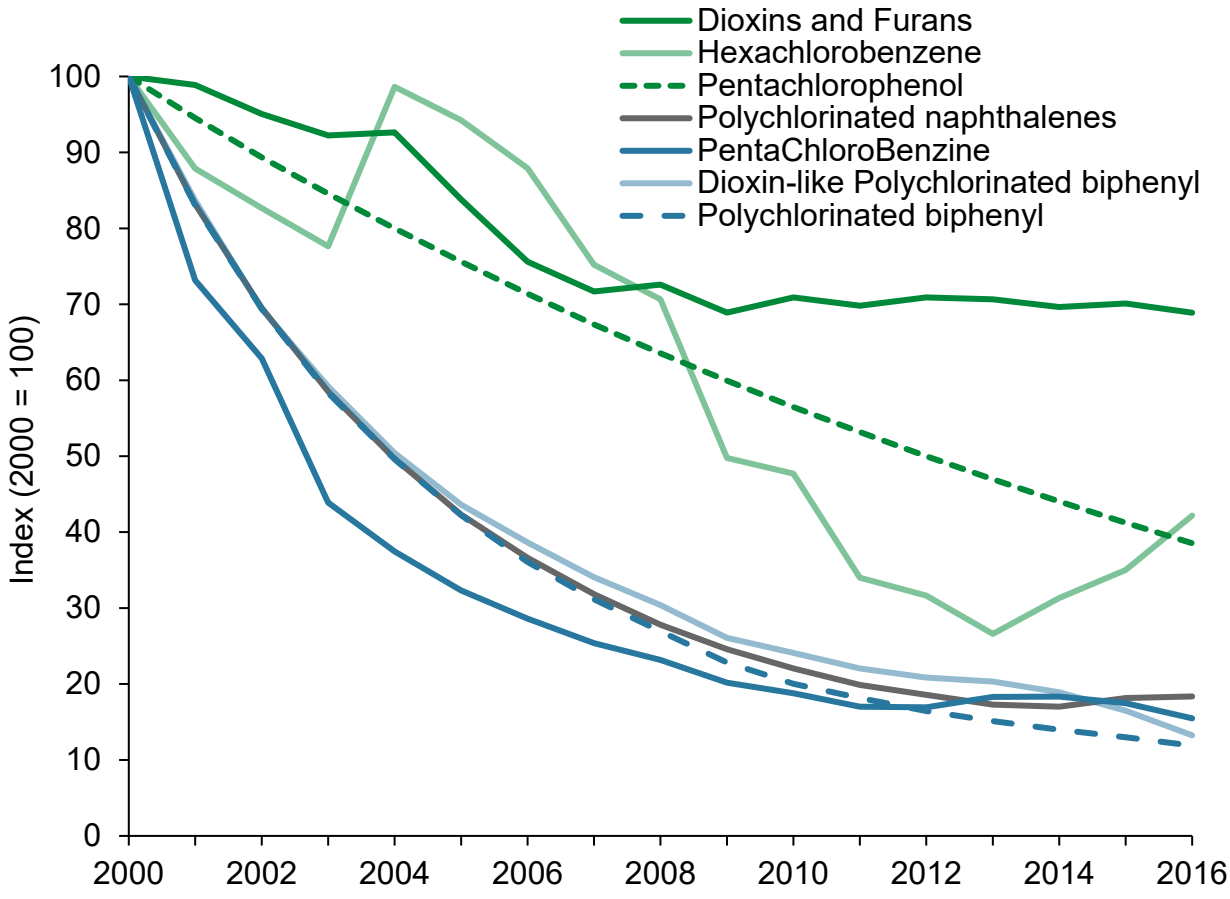
Some information is already published: Persistent Organic Pollutants Multimedia Emissions Inventory, National Atmospheric Emissions Inventory, Pollutant Release and Transfer Registry and National Reports for the Stockholm Convention.

Figure H3a (interim), UK emissions of mercury to air, land and water, 2016 to 2018



Source, Larger industrial sites data, UK pollutant release and transfer register (UK-PRTR); Crematoria data, National Atmospheric Emissions Inventory (NAEI).

Figure H3b (interim), UK emissions of persistent organic pollutants to air, land and water, 2000 to 2016



Source, Persistent Organic Pollutants Multimedia Emissions Inventory

Note

Emissions of mercury from larger industrial sites (including primary ferrous and non-ferrous metal production, cement production, oil refining and combustion activities over 50 megawatts [coal-fired power stations]) are to air, land and water; emissions from crematoria are to air only. Combined, these sources account for approximately 85% of total mercury emissions in the UK. The balance of emissions come from consumer product waste and contaminated sites; these are not currently included in this indicator.

Emissions of POPs are to air, land and water; POPs are also present in landfill and other waste streams, which are not currently included in these data. Historical data are available which show significantly reduced emissions prior to 2000; data are presented here from 2000 onwards to focus upon recent trends. While the currently available data for POPs predate the 25 Year Environment Plan, they reflect the most recently available information on the emissions of the 7 POPs included within this indicator and enable a better understanding of a baseline from which to measure progress towards the goals of the 25 Year Environment Plan. Updated data, including results for 2017 and 2018, are expected to be published in Summer 2021; these new data will be reflected in future indicator updates.

Trend description

a) Emissions of mercury to air, land and water

In 2018, UK emissions of mercury from larger industrial sites and crematoria totalled 2,465 kg, with larger industrial sites accounting for 75% of this total.

b) Emissions of persistent organic pollutants to air, land and water

UK emissions of all 7 POPs included within this indicator have fallen between 2000 and 2016.

Dioxins and furans are a family of chemicals strongly associated with thermal processes linked to combustion (particularly of waste) and manufacture of metals. Their emissions were already reduced by 60% between 1990 and 2000, with improvements in technology and tighter environmental regulations contributing to this fall. Between 2000 and 2010, emissions of dioxins and furans fell by a further 30% but have since levelled out, with emissions post-2010 largely linked to more diffuse sources such as domestic combustion of solid fossil fuels, accidental fire, and illegal burning of waste.

By 2013, emissions of hexachlorobenzene had fallen to 26% of their 2000 baseline figure but have risen annually between 2013 and 2016 to reach 42% of emissions in 2000. This is linked to waste incineration and the increasing use of a specific pesticide (chlorothalonil) for which it is a by-product. Emissions of pentachlorophenol have fallen consistently since 2000 to reach 39% of their baseline figure in 2016. Emissions of the remaining 4 POPs have followed a very similar pattern to each other, falling sharply in the first 10 years and

then levelling out to between 13% and 18% of their baseline figures in 2016. In particular for polychlorinated biphenyls and dioxin-like polychlorinated biphenyls, this relates to remaining final in-use stocks of heat-transfer fluids in di-electric equipment in the energy transmission networks.

H4 Exposure and adverse effects of chemicals on wildlife in the environment

Short description

This indicator tracks changes in the exposure of wildlife to chemicals in the environment and considers the risks to wildlife from chemicals in terrestrial, freshwater and marine ecosystems. Data are currently available for specific chemicals in birds of prey, water, fish, mammals, and shellfish. Other exposure data for chemicals will be incorporated should they become available in the future. The indicator will also be developed to consider the adverse effects of chemicals on wildlife populations and individuals.

This indicator is complementary to other indicators within the framework that give data on environmental pressures from chemicals, for example ‘B1 Pollution loads entering waters’ and ‘H3 Emissions of mercury and persistent organic pollutants to the environment’.

Relevant goals in the 25 Year Environment Plan

- Managing exposure to chemicals
- Thriving plants and wildlife

Relevant target in the 25 Year Environment Plan

None

Position in the natural capital framework

Pressure on natural capital assets

Related reporting commitments

- Marine Strategy Regulations 2010 and the assessment of Good Environmental Status in Regional Seas
- Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)
- Water Environment (Water Framework Directive) Regulations 2017
- Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015

Geographical scope

England and UK for some marine components.

Status of indicator development

Interim

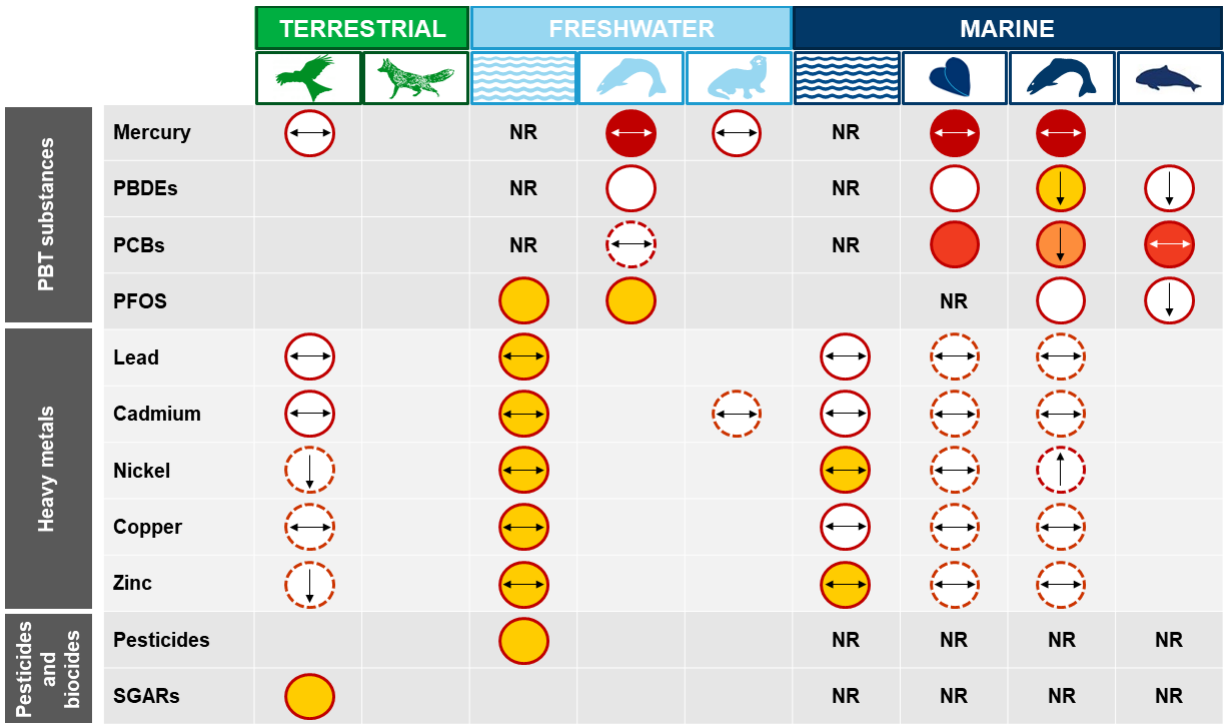
Readiness and links to data

This indicator is not available for reporting in 2021 in a finalised form. An interim indicator is presented here as an Experimental Statistic that covers the exposure of wildlife to chemicals in the environment and, where feasible, the risk from different types of chemicals to wildlife on land and in water. The indicator is based on chemical concentrations found in water and in different organisms – sparrowhawk/red kite, red fox (data extraction under development), freshwater fish, otter, blue mussel, dab, and harbour porpoise. It covers 3 environmental compartments: terrestrial, freshwater and marine (estuarine, coastal and offshore) The chemicals are representative of 3 groups highlighted for attention under the 25 Year Environment Plan: persistent, bioaccumulative and toxic (PBT) substances, heavy metals, and pesticides and biocides.

These data are being published as an Experimental Statistic in order to facilitate user involvement in the development of this indicator. We would therefore welcome any feedback on these statistics, particularly on their usefulness and value, via 25YEPindicators@defra.gov.uk. Further details on the indicator development and data analysis used are given in the supporting H4 indicator report. Some data relevant to this indicator are published: Predatory Bird Monitoring Scheme – contaminant exposure, Water Quality Data Archive, OSPAR.

A trial of this interim indicator was independently reviewed in 2020. We will continue to work with partners through 2021 to improve our reporting based on recommendations and our findings. We will seek to address data gaps for all substances to get a fuller picture across compartments and improve our ability to report exposure trends. Future work will also consider methods for reporting the effects on wildlife of chemicals in the environment.

Figure H4 (interim), Exposure of wildlife to chemicals in the environment in England and, for some marine components the UK; up to 2019 where available



Key

Data sources
Sparrowhawk / red kite; Red fox; Freshwater; Roach / chub / brown trout; Otter; Estuarine / coastal waters; Blue mussels; Dab; Harbour porpoise

Acronyms
PBT: persistent, bioaccumulative and toxic; PBDEs: polybrominated diphenyl ethers; PCBs: polychlorinated biphenyls; PFOS: perfluorooctanesulfonic acid; SGARs: second-generation anticoagulant rodenticides; NR: not relevant – unlikely to be an exposure route for that substance

Trend
Increasing concentrations; No observed change in concentrations; Decreasing concentrations

Only statistically significant trends in environmental concentrations are shown for upward and downward arrows; no arrow indicates minimum requirements for trend assessment are not met. Available year ranges for assessing trends vary and trends are only assessed for data sources with at least 5 full years of change (6 independent sampling years).

Risk
More than 75% sites/samples above threshold; 50 to 74% sites/samples above threshold; 25 to 49% sites/samples above threshold; 1 to 24% sites/samples above threshold; All sites/individuals or population average below threshold; No threshold available; not currently able to assess risk

Assessment is based on comparison of concentration data for the most-recent year, 2 years for dab and 3 years for PFOS and heavy metals in water.

Notes
1. Blank spaces indicate there are currently insufficient or no comparable data available to allow trend or risk reporting.
2. Data cover up to and including 2019 where available; exceptions are mercury (2013) and heavy metals (2014) in sparrowhawk, mercury and cadmium in otter (2016), and PBT substances in harbour porpoise (2018).

Source, Environment Agency

Note

Available thresholds for wildlife have been used to provide context to the most-recent national concentrations; their use to indicate risk does not represent a compliance assessment and should not be compared with other regulatory reporting regimes which may use values with different protection goals. The approach for deriving thresholds is specific to the wildlife or environmental medium being considered because of the data available and the purpose for which it was gathered. Monitoring networks and thresholds can change over time.

The freshwater risk assessment for pesticides is currently based on a threshold for short-term toxic effects. In the future, a long-term threshold will be used to reflect risks from chronic exposure.

Additional data are available for otter, freshwater fish and red fox which cannot be incorporated into the dashboard at present, but are provided in the supporting report to this indicator. The report also contains information on spatial variation in results for freshwater metals sites and for marine fish.

Trend description

PBT substances

Downward trends are observed for polybrominated diphenyl ethers (PBDEs) and polychlorinated biphenyls (PCBs) in marine fish (dab) and for PBDEs and perfluorooctanesulfonic acid in harbour porpoise. These trends are particularly evident for PBDEs.

Exceedance of thresholds is most significant for mercury in the freshwater and marine environments, followed by PCBs in the marine environment. The result for mercury in dab may be over-precautionary for reasons given in the supporting report.

Heavy metals

For heavy metals, downward trends are observed for nickel and zinc in sparrowhawks, although the data are only available up to 2014. There is an upward trend for nickel in dab, which is driven by eastern and southern coastal marine sites.

The exceedance of the nickel threshold in estuarine and coastal waters is only driven by one site. Zinc shows the highest rate of threshold exceedance of the metals in both freshwater and estuarine and coastal waters.

While the freshwater data for heavy metals show no change in concentrations from 2014 to 2019, these results can be split into 2 types: those for sites where the waters are affected by abandoned metal mines and those for sites in other locations. Cadmium and copper exhibit downward trends for the ‘other’ sites over the assessed time period. For waters affected by abandoned metal mines, their elevated levels of metals mean that they

comprise a high proportion of those sites above available thresholds, except for nickel where sites in other locations comprise the majority of those at risk.

Pesticides and biocides

It is not possible to assess trends currently for pesticides and second-generation anticoagulant rodenticides (SGARs). Risk is indicated for less than a quarter of sites or individuals considered for pesticides in water and SGARs in red kite.

H5 Exposure to transport noise

Short description

This indicator will track changes in the exposure of people to noise from transportation sources. It does not include neighbour and neighbourhood noise. The indicator will show the estimated number of people exposed to noise levels (in 5 decibel bands) from the most significant road, rail and air sources. Health costs (and hence burden to the economy) of noise can be estimated from health outcomes associated with noise exposure (such as annoyance, sleep disturbance, and cardiovascular effects). The available data being explored for this indicator's development are currently derived through strategic noise mapping undertaken at 5-year intervals.

Relevant goal in the 25 Year Environment Plan

- Enhanced beauty, heritage and engagement with the natural environment

Relevant target in the 25 Year Environment Plan

- None

Position in the natural capital framework

Pressure on natural capital assets

Related reporting commitments

- Environmental Noise (England) Regulations (as amended) 2006

Geographical scope

England, potential to disaggregate the data regionally.

Status of indicator development

In development

Readiness and links to data

This indicator is not available for reporting in 2021 as further work is required to develop the indicator. Data for noise exposure are published.

Theme J: Resource Use and Waste

J1 Carbon footprint and consumer buying choices

Short description

This indicator tracks the carbon footprint of England's residents, by showing changes in the greenhouse gas (GHG) emissions associated with final demand for goods and services in England, wherever the emissions arise across the globe. The indicator will show how consumer preferences and behaviour are impacting on the overall national carbon footprint.

Relevant goals in the 25 Year Environment Plan

- Minimising waste
- Mitigating and adapting to climate change

Relevant targets in the 25 Year Environment Plan

- Working towards our ambition of zero avoidable waste by 2050
- Making sure that all policies, programmes and investment decisions take into account the possible extent of climate change this century

Position in the natural capital framework

Pressure on natural capital assets

Related reporting commitments

- None

Geographical scope

England

Status of indicator development

Interim

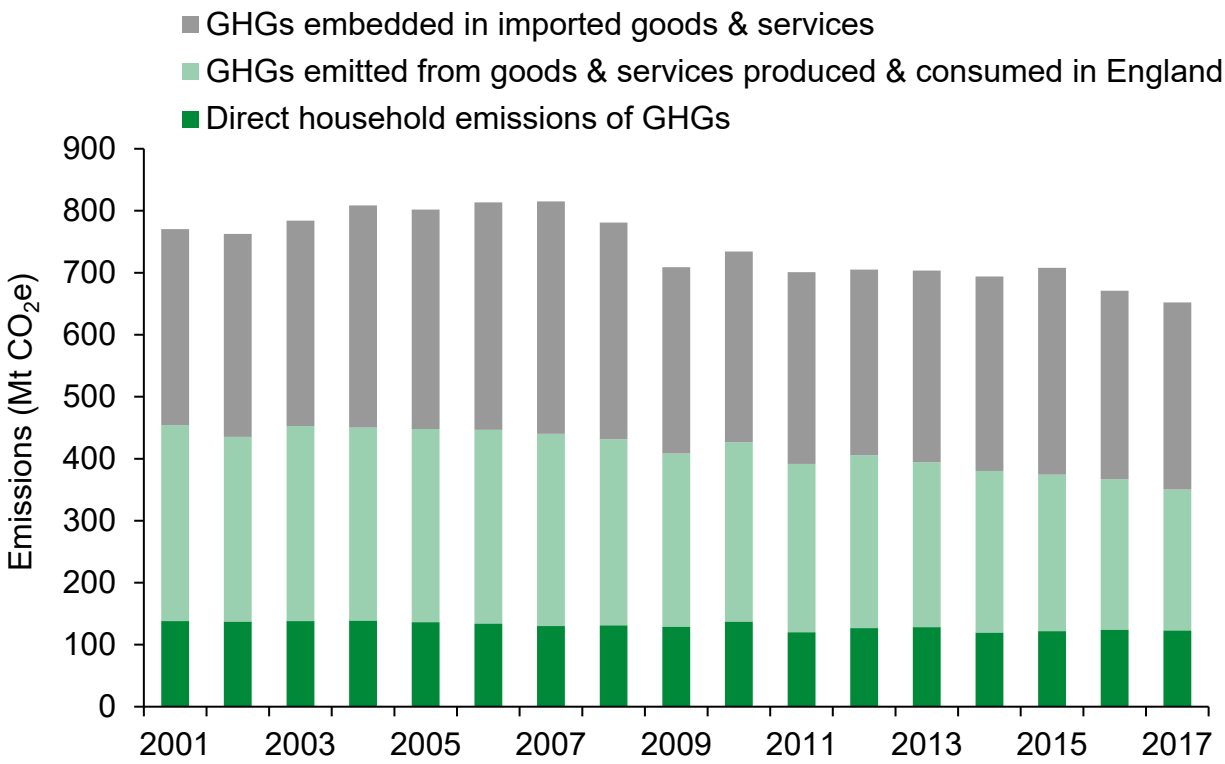
Readiness and links to data

This indicator is not available for reporting in 2021 in a finalised form. An interim indicator is presented here that shows consumption-based GHG emissions in England. Data

underpinning this metric are available in Material footprint and resource efficiency in the UK. These source are currently published as Experimental Statistics whilst there are ongoing refinements to the methodology.

Data at a UK level are published as UK's carbon footprint. Further data may be available in the future tracking an index of carbon emissions impacts due to consumer buying choices.

Figure J1 (interim), Consumption-based greenhouse gas emissions in England, 2001 to 2017



Source, Defra

Note

While the currently available data predate the 25 Year Environment Plan, they provide the most recently available assessment of consumption-based GHG emissions in England. They enable a better understanding of a baseline from which to measure progress towards the goals of the 25 Year Environment Plan when the indicator is next updated.

Trend description

England's carbon footprint (carbon dioxide, methane and nitrous oxides) was estimated to be equivalent to 652.3 million tonnes of carbon dioxide ($MtCO_2e$) in 2017, a 15.3% reduction on levels in 2001 (770.5 $MtCO_2e$). GHGs emitted directly by households (making up 18.8% of the footprint in 2017) were 11.1% lower in 2017 than in 2001 as a result of reductions in emissions associated with household-related heating. Total consumption-based emissions have been on a downward trajectory since 2007: the greatest

contribution to this trend has come from the goods and services produced in England and consumed here; and emissions embedded in imports have also reduced substantially (26.6% and 19.5% respectively from a 2007 peak overall). As a proportion of total emissions in 2017, GHGs emitted overseas in the production of goods and services consumed in England made up roughly half (46.3%) of the total footprint.

J2 Raw material consumption

Short description

This indicator shows trends in the amount of (a) raw material consumption (RMC) per capita and (b) the amount of gross value added (GVA) per unit of raw material consumption. These measures give a proxy for the scale of our environmental impact associated with our material consumption, while helping identify how efficiently natural resources are being used and the extent to which economic output is being decoupled from consumption of materials.

Relevant goals in the 25 Year Environment Plan

- Using resources from nature more sustainably and efficiently
- Mitigating and adapting to climate change

Relevant target in the 25 Year Environment Plan

- Maximising the value and benefits we get from our resources, doubling resource productivity by 2050

Position in the natural capital framework

Pressure on natural capital assets

Related reporting commitments

- Links to the UN Sustainable Development Goals 8 and 12

Geographical scope

England

Status of indicator development

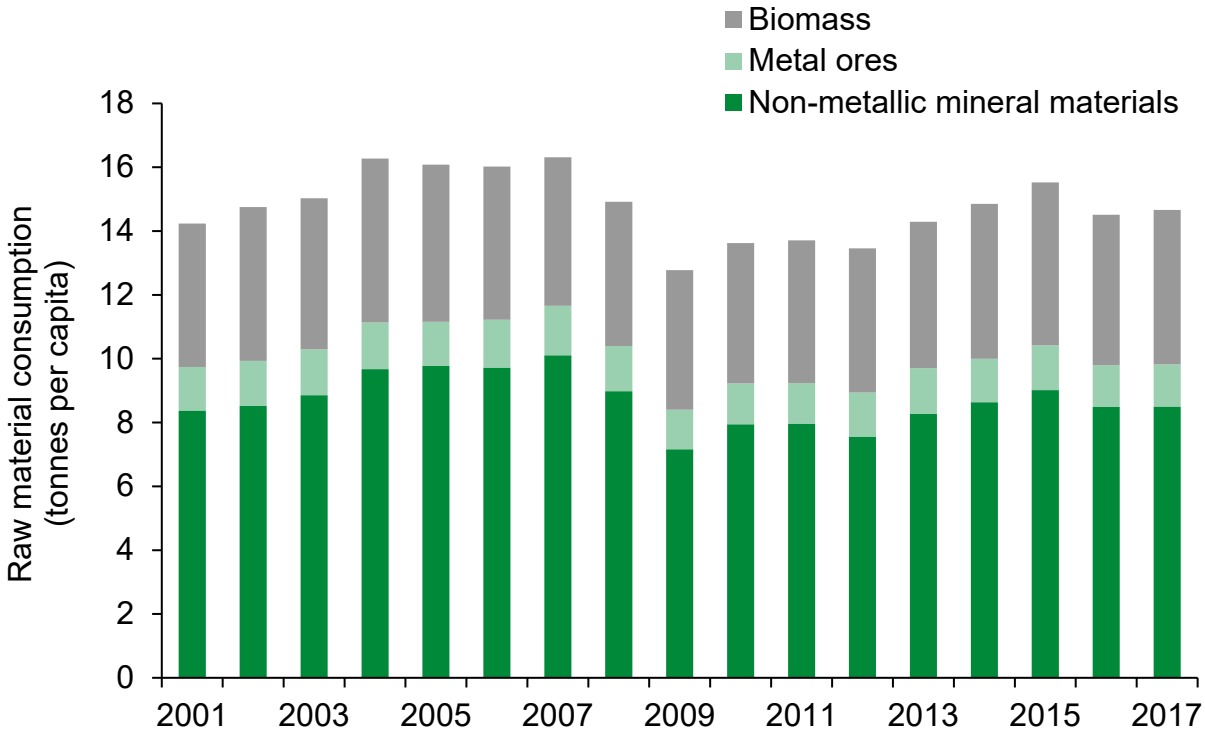
Final

Readiness and links to data

Data on RMC underpinning each metric are available in Material footprint and resource efficiency in the UK. These source data are currently published as Experimental Statistics whilst there are ongoing refinements to the methodology. GVA data are published by the

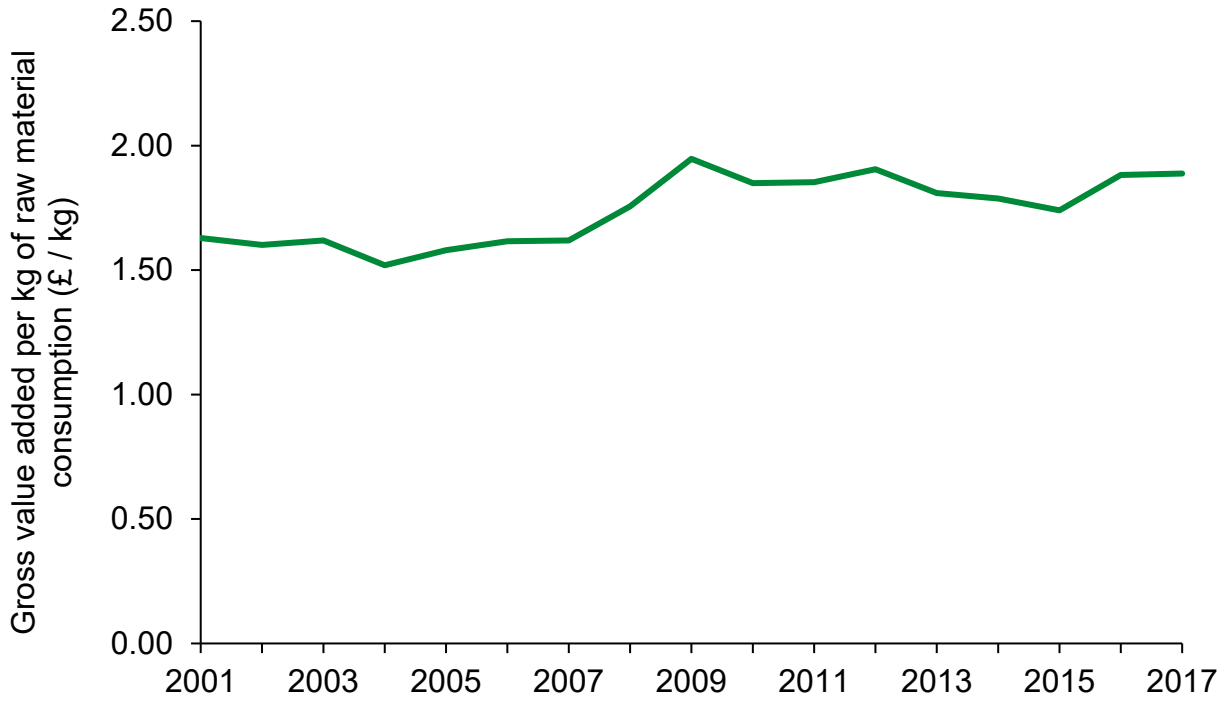
Office for National Statistics (2019) Nominal and real regional gross value added (balance) by industry. Population data are published by the Office for National Statistics (2019) Estimates of the population for the UK, England and Wales, Scotland and Northern Ireland.

Figure J2a, Raw material consumption (excluding fossil fuels) per capita in England, 2001 to 2017



Source, Defra; Office for National Statistics

Figure J2b, Gross value added per kg of raw material consumption (excluding fossil fuels) in England, 2001 to 2017



Source, Defra; Office for National Statistics

Note

While the currently available data predate the 25 Year Environment Plan, they provide the most recently available assessment of raw material consumption in England. They enable a better understanding of a baseline from which to measure progress towards the goals of the 25 Year Environment Plan when the indicator is next updated.

Trend description

a) Raw material consumption per capita

The average material footprint per capita in England (excluding fossil fuels) increased by 3.0% between 2001 and 2017. It rose steadily between 2001 and 2007, before declining sharply during the recession. It rose again to 2015 and fell back in 2016 and 2017, to 14.7 tonnes per capita. Within the overall total, there have been increases in per capita consumption of both biomass and non-metallic mineral materials between 2001 and 2017, whilst for metal ores there has been a slight decrease.

b) Gross value added per kg of raw material consumption

In 2017, England generated approximately 15.9% more economic value than in 2001 (measured by GVA per unit of RMC (excluding fossil fuels) also described as resource productivity). Resource productivity measured on this basis, rose from £1.63 of GVA per

kg of RMC in 2001 to £1.89 in 2017. Resource productivity peaked at £1.95 in 2009 as a result of a sharp drop in RMC relative to economic activity during the recession. It has since declined against this peak, but remains above pre-recession levels.

J3 Municipal waste recycling rates

Short description

This indicator shows changes in municipal waste recycling rates in England. The municipal waste recycling rate is the fraction of household waste and waste similar in nature and composition to household waste, which is recycled. The indicator reflects levels of everyday waste that is recycled and not sent for final disposal. Development of the Defra 'waste tracking' tool and further integration with data collected by local authorities will close some of the data gaps and enable collection of more comprehensive data.

Relevant goal in the 25 Year Environment Plan

- Minimising waste

Relevant target in the 25 Year Environment Plan

- Working towards our ambition of zero avoidable waste by 2050

Position in the natural capital framework

Pressure on natural capital assets

Related reporting commitments

- None

Geographical scope

England; some data are available for local authorities.

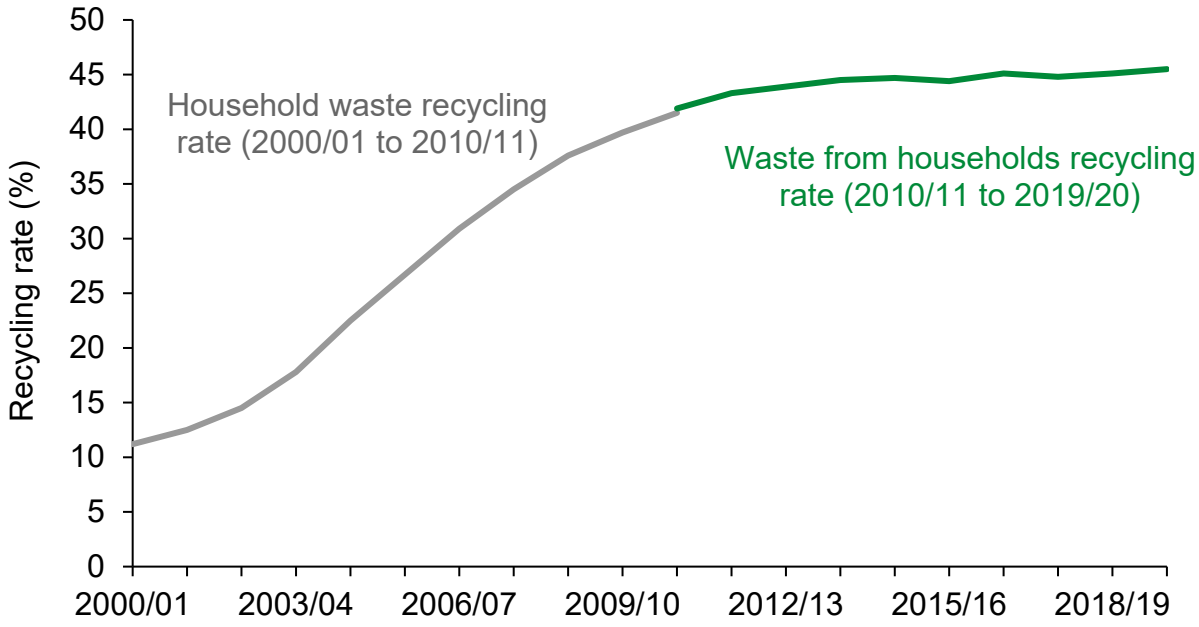
Status of indicator development

Interim

Readiness and links to data

This indicator is not available for reporting in 2021 in a finalised form. An interim indicator is presented here that shows trends in 'household waste' and 'waste from households' recycling rates. These data are already published annually as National Statistics, but further development is required to include waste that is similar in nature and composition to household waste such as non-household municipal waste. Information is available about the development of Defra's 'waste tracking' tool.

Figure J3 (interim), 'Household waste' and 'waste from households' recycling rates in England, 2000/01 to 2019/20



Source, Defra

Note

The recycling measure reported changed from 'household waste' to 'waste from households' in 2010/11; data for both measures are for April to March (financial years).

Trend description

In the 2019/20 financial year, the recycling rate for 'waste from households' was 45.5%, up 3.6 percentage points on the equivalent figure for 2010/11 (when the measure was first reported). While the measure of 'household waste' recycling is based on a slightly broader definition of waste and therefore not directly comparable to 'waste from households', there has been a 34.3 percentage point increase in the waste recycling rate across the 2 measures between 2000/01 and 2019/20.

J4 Residual waste arising by type and sector

Short description

This indicator shows how much waste is incinerated and landfilled in England rather than recycled, reused or treated further up the waste hierarchy. Data presented are captured through the Environment Agency's permitted site data and annual monitoring reports. There are still gaps in the data and these will need to be addressed in order to provide reporting by source sector.

Relevant goal in the 25 Year Environment Plan

- Minimising waste

Relevant targets in the 25 Year Environment Plan

- Working towards our ambition of zero avoidable waste by 2050
- Working to a target of eliminating avoidable plastic waste by end of 2042
- Meeting all existing waste targets – including those on landfill, reuse and recycling – and developing ambitious new future targets and milestones

Position in the natural capital framework

Pressure on natural capital assets

Related reporting commitments

- None

Geographical scope

England

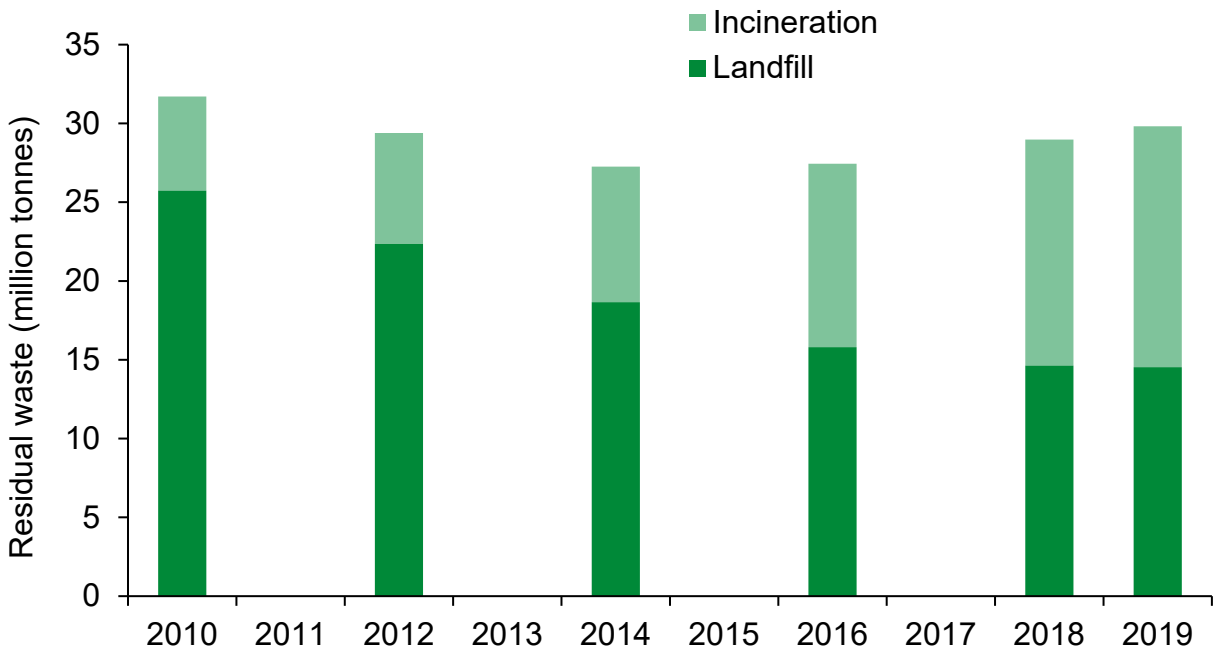
Status of indicator development

Interim

Readiness and links to data

This indicator is not available for reporting in 2021 in a finalised form. An interim indicator is presented here that shows trends in waste landfilled or incinerated (with and without energy recovery) in England, excluding major minerals. Some data are available via the Environment Agency Waste data interrogator and incineration monitoring reports, but further work is required to split these data by source sector.

Figure J4 (interim), Residual waste (excluding major mineral wastes) in England, 2010 to 2019



Source, Environment Agency

Note

Data were reported biennially from 2010 to 2018; moving forward, data are reported on an annual basis.

Trend description

Residual waste here refers to waste sent to landfill or incineration in England. In 2019, the total quantity of waste (excluding major mineral wastes) landfilled or incinerated in England was 29.8 million tonnes, a 6.0% reduction against levels in 2010 (31.7 million tonnes). This reduction was due to less waste being landfilled (falling by 43.6% over the period), whereas waste sent to incineration more than doubled, increasing by 156.2% over the same period.

J5 Prevent harmful chemicals from being recycled

Short description

This indicator will track the amount of banned or restricted chemicals in waste which is being destroyed. The removal and proper destruction of such chemicals is necessary to prevent them contaminating recycled products or being released into the environment.

Initially the indicator will use data on the amount of persistent organic pollutants (POPs) being sent for destruction. This is in line with the goal to substantially increase the amount of POPs material being destroyed or irreversibly transformed by 2030. Similar data on elimination of the use of polychlorinated biphenyls (PCBs) will be included once those data become available.

Where possible, these chemicals should be removed prior to disposal, minimising the amount of waste being sent for destruction. Data may soon become available for some of these waste types, enabling assessment of improvements in the quantity and quality of waste material available for recycling.

Relevant goals in the 25 Year Environment Plan

- Managing exposure to chemicals
- Minimising waste

Relevant targets in the 25 Year Environment Plan

- Fulfilling our commitments under the Stockholm Convention as outlined in the UK's most recent National Implementation Plan
- Substantially increasing the amount POPs material being destroyed or irreversibly transformed by 2030, to make sure there are negligible emissions to the environment
- Seeking in particular to eliminate the use of PCBs by 2025, in line with our commitments under the Stockholm Convention
- Working towards our ambition of zero avoidable waste by 2050

Position in the natural capital framework

Pressure on natural capital assets

Related reporting commitments

- Persistent Organic Pollutants Regulation (Article 13)
- UN Stockholm Convention on Persistent Organic Pollutants (Article 15)

Geographical scope

UK; data are also available at regional level, and by local and waste planning authority.

Status of indicator development

In development

Readiness and links to data

This indicator is not available for reporting in 2021; some data are already published via the hazardous waste interrogator. Further work is required to develop the indicator, initially for POPs and subsequently for PCBs.

J6 Waste crime

Short description

This indicator tracks changes in the scale of key aspects of waste crime. Waste crime is a broad term encompassing fly-tipping, illegal waste sites, illegal waste exports, the misdescription of waste and illegal waste dumping, among other illegal waste-related activities. If not handled properly, waste can cause serious pollution of the environment – air, land and water, which can also be harmful to health. It further reduces the availability of resources from waste. Current data reported include illegal waste sites and fly-tipping. The underpinning data can be used to establish the level of criminal activity for some aspects of waste crime and geographic distribution. Options for further development will be considered, including the impacts and behavioural aspects of waste crime, the amount and types of potential resources lost through waste crime, and to reflect the need for targeting and effective enforcement to deliver reductions in the level of criminal activities.

Relevant goal in the 25 Year Environment Plan

- Minimising waste

Relevant target in the 25 Year Environment Plan

- Seeking to eliminate waste crime and illegal waste sites over the lifetime of this Plan, prioritising those of highest risk

Position in the natural capital framework

Pressure on natural capital assets

Related reporting commitments

- None

Geographical scope

England and at individual site or facility level.

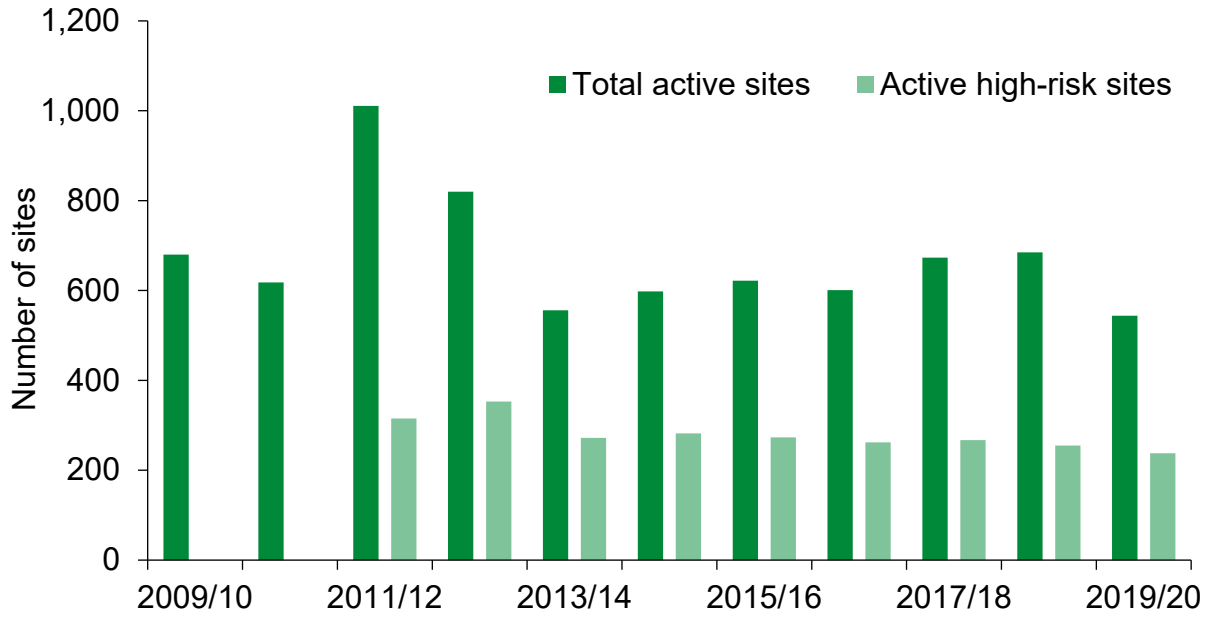
Status of indicator development

Interim

Readiness and links to data

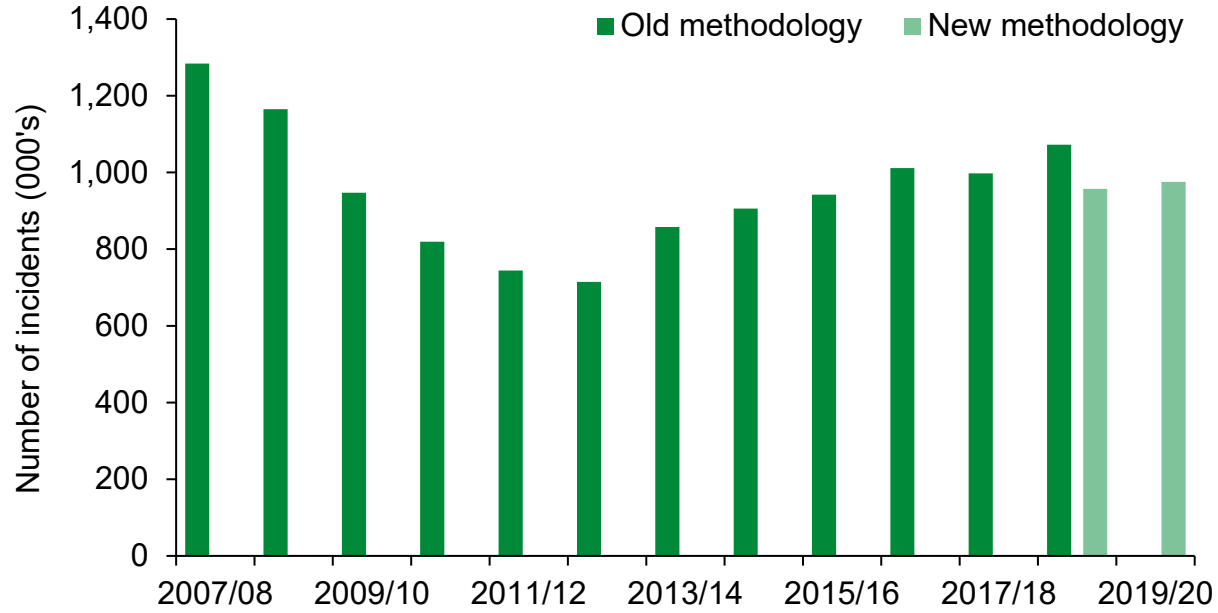
This indicator is not available for reporting in 2021 in a finalised form. An interim indicator is presented here that shows the number of: (a) illegal waste sites and (b) fly-tipping incidents in England. Some data on illegal waste sites and fly-tipping are already published, but further work is required to develop the final indicator.

Figure J6a (interim), Illegal waste sites in England, 2009/10 to 2019/20



Source, Environment Agency

Figure J6b (interim), Fly-tipping incidents in England, 2007/08 to 2019/20



Source, Defra

Note

Illegal waste site and fly-tipping data are for April to March (financial years).

Illegal waste site data for 2009/10 and 2010/11 are for the total number of active waste sites; a breakdown of these data into active sites and active high-risk sites is not available.

Concerted sampling efforts from the Environment Agency to identify and investigate illegal waste sites resulted in a peak number being observed in 2011/12. In subsequent years activity focused on interventions to disrupt and deal with offenders and close down illegal waste sites.

The 2019/20 total for fly-tipping incidents in England is not comparable to earlier years due to methodological changes. These methodological changes have also been applied to the 2018/19 results in order to show the effects of adopting the new methodology. Detailed information on these changes can be found in the reporting basis section of the source statistical notice.

Trend description

a) Illegal waste sites

The total number of illegal waste sites in England fell from a peak of 1,011 active sites in the financial year 2011/12 to 556 active sites in 2013/14. Since then, the number has increased gradually, reaching 685 sites in 2018/19, before falling again to 544 sites in 2019/20. Within this total, the number of active high-risk illegal waste sites fell by 32.6% from a peak of 353 sites in 2012/13 to 238 sites in 2019/20.

b) Fly-tipping incidents

The total number of fly-tipping incidents reported in England fell from 1.28 million incidents in the financial year 2007/08 to 715,000 incidents in 2012/13. Since these initial reductions, the number of incidents reported under the old methodology increased to over 1 million (1.07 million) between 2012/13 and 2018/19. The total number of fly-tipping incidents reported in 2018/19 under the new methodology was 957,000, 10.8% (115,000 incidents) lower than the total reported under the old methodology. In 2019/20, this total increased by 1.9% to 975,000 incidents relative to 2018/19.

Theme K: International

K1 Overseas environmental impacts of UK consumption of key commodities

Short description

This indicator will track the impact on the environment overseas resulting from our domestic consumption, linked to the sustainability of the products we import. We are exploring methods and data for this indicator that could include a measure of the environmental impact of some of the commodities we import (for example, on deforestation and/or water stress).

Relevant goal in the 25 Year Environment Plan

- There are no specific goals in the 25 Year Environment Plan for this indicator, however the Plan commits us to leaving a lighter footprint on the global environment by enhancing sustainability and supporting zero deforestation supply chains.

Relevant target in the 25 Year Environment Plan

- None

Position in the natural capital framework

Service or benefit associated with natural capital asset

Related reporting commitments

- Convention on Biological Diversity Aichi Target 4
- Sustainable Development Goals 12, 14 and 15

Geographical scope

International

Status of indicator development

In development

Readiness and links to data

This indicator is not available for reporting in 2021. Between 2018 and 2020, we have undertaken research to support development of this indicator, including review of existing methodologies of global impacts indicators, tracing impact through supply chains and appropriate metrics. Based on this work, multi-regional input-output modelling has been selected as the method that will underpin this indicator. A proof of concept study has been carried out and internationally peer reviewed. This year, data are being collated and modelling is taking place This will be completed by August 2021, and so the indicator should be available to report in 2022.

In addition, we have undertaken a comprehensive review of published platforms and tools, including their readiness and context to assess how these may be relevant to understanding the impacts of UK consumption on the environment overseas.

K2 Developing countries better able to protect and improve the environment with UK support

Short description

The poorest people and countries in the world are often the most vulnerable and likely to be hardest hit by the degradation of natural environments. Climate change and the

deterioration of natural environments are prime drivers of poverty, food insecurity and instability, and can trigger conflict and migration. This indicator will report outcomes of UK investment programmes (such as International Climate Finance, the Darwin Initiative and the Illegal Wildlife Challenge Fund) that support developing countries to protect and improve the environment, address illegal wildlife trade, mitigate and adapt to climate change and alleviate poverty.

Relevant goal in the 25 Year Environment Plan

- There are no specific goals in the 25 Year Environment Plan for this indicator; however, the Plan commits us to helping developing nations protect and improve the environment

Relevant target in the 25 Year Environment Plan

- None

Position in the natural capital framework

Service or benefit associated with natural capital asset

Related reporting commitments

- None

Geographical scope

International

Status of indicator development

In development

Readiness and links to data

This indicator is not available for reporting in 2021. Further development is needed to identify how to assess outcomes of UK overseas investment building on existing evaluation schemes for International Climate Finance, The Darwin Initiative, and the Illegal Wildlife Trade Challenge Fund.

K3 Status of endemic and globally threatened species in the UK Overseas Territories

Short description

UK Overseas Territories are home to rich, globally important biodiversity, with many species found nowhere else in the world. This indicator will track change in the status of key endemic and globally threatened species found in the Overseas Territories.

Relevant goals in the 25 Year Environment Plan

- There are no specific goals in the 25 Year Environment Plan for this indicator, but the Plan commits us to taking action to recover threatened, iconic or economically important species of animals, plants and fungi, and where possible to prevent human-induced extinction or loss of known threatened species, in the Overseas Territories.

Relevant target in the 25 Year Environment Plan

- None

Position in the natural capital framework

Condition of assets – species and ecological communities

Related reporting commitments

- Convention on Biological Diversity Aichi Target 12
- Sustainable Development Goals 14 and 15

Geographical scope

UK Overseas Territories

Status of indicator development

In development

Readiness and links to data

This indicator is not available for reporting in 2021. Further work is required to develop the indicator. To-date, preliminary work has been undertaken to explore potential sources of endemic species information. This includes the International Union for Conservation of Nature Red List of Threatened Species.

K4 Extent and condition of terrestrial and marine protected areas in the UK Overseas Territories

Short description

The UK Overseas Territories (UKOTs) are home to a variety of spectacular and often unique marine and terrestrial ecosystems. Protected areas are a key tool for conserving the globally significant and, in many cases endemic, biodiversity found in the Territories. This indicator will have 2 components: (a) extent and (b) condition of UKOT protected areas. It will show changes in the coverage of protected areas and other effective area-based conservation measures (OECMs) across the UKOTs, from a 2020 baseline. The baseline is calculated using UKOT protected area extent data provided by UKOT

governments. The areas are aggregated across UKOTs and geographical regions and percent coverage is calculated for the land and marine environments separately. The indicator will also demonstrate the condition of protected areas in the UKOTs, using aspects of protected area condition that can be assessed cost-effectively.

Relevant goal in the 25 Year Environment Plan

- There are no specific goals in the 25 Year Environment Plan for this indicator, but the Plan commits us to working with the Overseas Territories governments to implement effective monitoring and enforcement of large scale marine protected areas as part of the Blue Belt programme.

Relevant target in the 25 Year Environment Plan

- None

Position in the natural capital framework

Condition of assets – seas; land; species and ecological communities; freshwater

Related reporting commitments

- Convention on Biological Diversity Aichi Target 11
- Sustainable Development Goals 14 and 15

Geographical scope

UK Overseas Territories

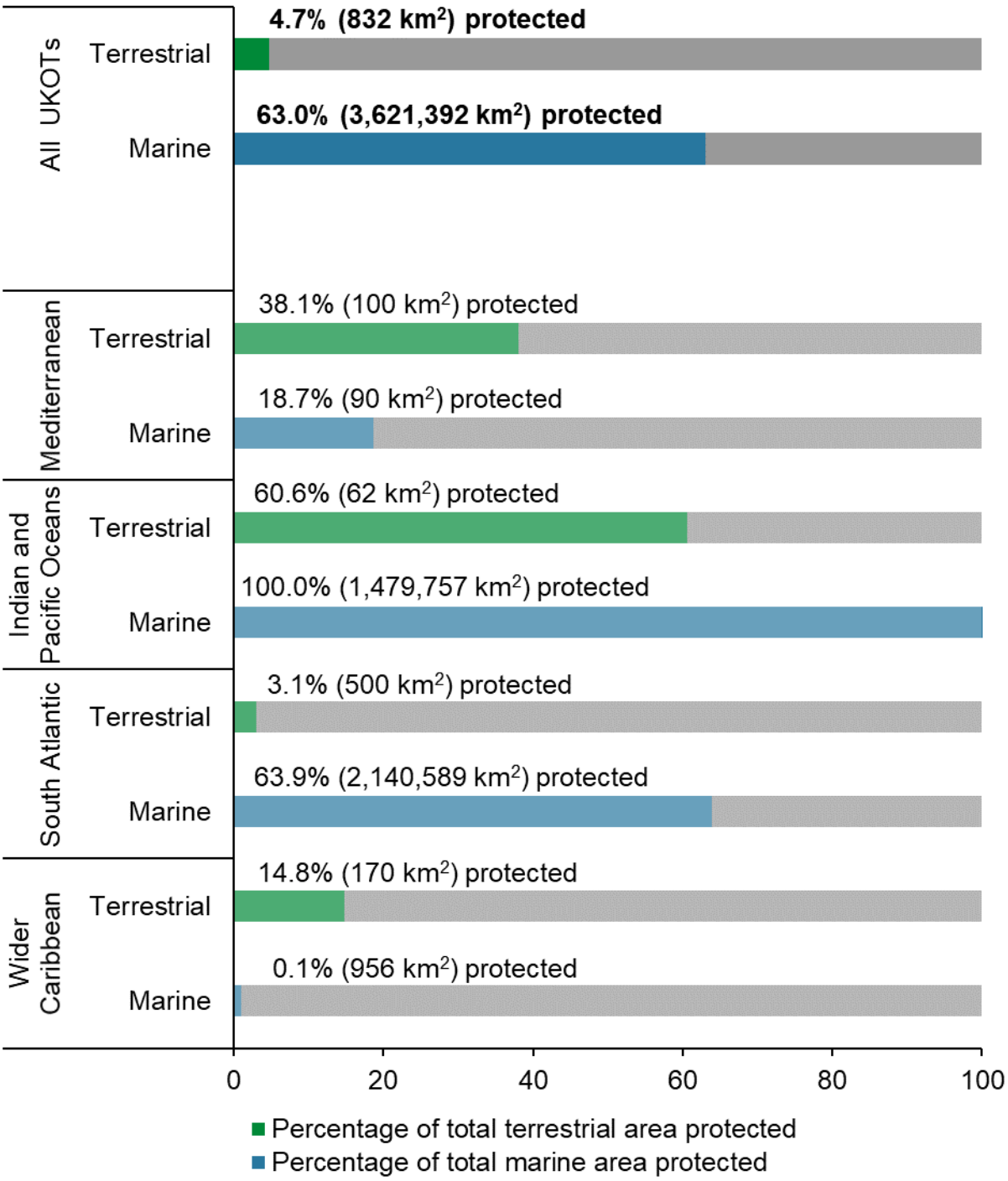
Status of indicator development

Interim

Readiness and links to data

This indicator is not available for reporting in 2021 in a finalised form. An interim indicator is presented here that shows the extent of protected areas and OECMs across the UKOTs. These extent data are reported for the first time in 2021 as an Experimental Statistic; information on how the data have been obtained and how the statistics have been calculated is available in JNCC Report No. 679. The data are being published as Experimental Statistics in order to facilitate user involvement in the development of this indicator. We would therefore welcome any feedback on these statistics, particularly on their usefulness and value, via 25YEPindicators@defra.gov.uk. Research has been commissioned to support development of the condition aspect of this indicator, including exploring the feasibility of using Earth Observation to assess the condition of protected areas.

Figure K4 (interim), Extent of terrestrial and marine protected areas and other effective area-based conservation measures in the UK Overseas Territories, in total and by region, 2020



Source, Joint Nature Conservation Committee

Note

'All UKOTs' (results presented in bold on the chart) includes 13 UK Overseas Territories; the British Antarctic Territory is not included. 'Mediterranean' includes the Sovereign Base

Areas of Akrotiri and Dhekelia and Gibraltar. ‘Indian and Pacific Oceans’ includes British Indian Ocean Territory and Pitcairn Islands group. ‘South Atlantic’ includes the Falkland Islands, St Helena, Ascension and Tristan da Cunha, and South Georgia and the South Sandwich Islands. ‘Wider Caribbean’ includes Anguilla, Bermuda, British Virgin Islands, Cayman Islands, Montserrat, and Turks and Caicos Islands.

The indicator includes protected areas and OECMs formally established up to and including 2020, where these are implemented for and/or deliver biodiversity conservation. Extent is measured using the outer boundaries of sites; the indicator does not assess the extent of management measures within protected areas and OECMs. UK Hydrographic Office data are used to map UK Overseas Territories’ seas in the absence of formally agreed maritime boundaries.

A new large Marine Protection Zone covering 687,223 km^2 of Tristan da Cunha’s waters was announced in November 2020. Once formally designated, this site will substantially increase marine protected area coverage across all UKOTs and within the South Atlantic region. These increases will be reflected in a future update to this indicator.

Percentages for the extent of terrestrial and marine environments in protected areas have been rounded to the nearest 0.1% (including one result rounded up to 100%).

Trend description

Protected areas and OECMs cover nearly two-thirds (63%) of the marine environment in the UKOTs but a much smaller proportion (4.7%) of the terrestrial environment. Given the UKOTs’ combined marine area is more than 300 times larger than the land area (approximately 5,748,600 km^2 of sea compared to 17,738 km^2 of land), the extent of marine protection (3.62 million km^2) is also 4 orders of magnitude larger than for the terrestrial environment (832 km^2). There are marked differences in protected area coverage between regions, with the 2 UKOTs in the Indian and Pacific Oceans protecting the greatest proportions of the terrestrial and marine environment (collectively) compared to other regions.

Annex 1: Official statistics

The term official statistics comprises National Statistics, official statistics and Experimental Statistics.

All official statistics are produced by crown bodies, those acting on behalf of crown bodies, or those specified in statutory orders, as defined in the Statistics and Registration Service Act 2007.

National Statistics have been assessed by the Office for Statistics Regulation, the regulatory arm of the UK Statistics Authority, as fully compliant with the Code of Practice for Statistics. Accredited National Statistics are identified by the following quality mark:

Official statistics are produced in accordance with the Code of Practice for Statistics and its key principles of trustworthiness, quality and value.

Experimental Statistics are newly developed or innovative statistics published so that users and stakeholders can be involved in the assessment of their suitability and quality at an early stage.

Measuring environmental change: Outcome Indicator Framework for the 25 Year Environment Plan

Statement of Voluntary Application of the Code of Practice for Statistics

Although this report is not in itself an official statistic or National Statistic compendium publication, where possible we follow the UK's Code of Practice for Statistics in its production and in the compilation of the indicator framework within it.

The code is built around 3 main concepts, or pillars:

Trustworthiness – *The focus of this principle is about building and maintaining confidence in the people and the organisations that publish information including that derived from National and official statistics.*

Quality – *The focus of this principle is on ensuring that we use data and methods that produce assured statistics.*

Value – *The focus of this principle is on publishing statistics that support society's need for information, addressing the questions that external users wish to have answered.*

The following explains how these pillars have been applied in a proportionate way to enable us to demonstrate voluntary compliance with many parts of the Code, in line with the Guide for Voluntary Application of the Code.

Trustworthiness

Measuring environmental change: Outcome Indicator Framework for the 25 Year Environment Plan provides references on the sources of all of the quoted information. For the most part, the report draws on formally published National or official statistics – either produced by Defra or by the department's Arms' Length Bodies, often with input from external environmental partners.

This release is not covered by the normal orderly release process required for all new National and official statistics – primarily because it draws upon already published information. This different release process is also appropriate in that this is in essence an operational performance report, used within the Defra Group to identify the outcomes of delivery to date and to prioritise areas for further action. Hence the draft report is circulated internally in advance of publication.

Quality

Where the statistics used in this report are National or official statistics, they have an existing quality assessment process. Details on the methodologies used in constructing the underlying statistics are set out in the original publications, which are referenced.

Where there are new indicators in development, these are clearly flagged. Where possible we will use the processes for 'experimental' statistics set out in the Code of Practice to govern their development and any future confirmation of these indicators. We continue to actively develop indicators in conjunction with stakeholders and for those evolving experimentally we are requesting user feedback, in particular to gauge the usefulness and value of the statistics.

Value

The indicators presented within this report were identified by a cross-disciplinary and cross-organisational team and views were sought from a range of external stakeholders and acted upon.

The overall annual report meets a government commitment (to produce an annual assessment of the progress in meeting the objectives set out in the 25 Year Environment Plan). A process has been put in place to ensure that the suite of indicators continues to be informed by and responsive to views from outside government as well as tracking commitments made inside government.