UK habitat natural capital accounts quality and methods guide

What the natural capital habitat accounts statistics cover, how we produce them, and their quality and comparability. Includes definitions and latest, past and upcoming changes.

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1 . Overview

Our habitat natural capital accounts provide estimates of the economic and social value of natural resources in UK habitats. This guide provides quality and methods information for:

- our Enclosed farmland natural capital accounts, UK bulletin
- our Woodland natural capital accounts, UK bulletin
- our Marine and coastal margins natural capital accounts, UK bulletin

Our accounts are compiled in line with the United Nations (UN) System of Environmental-Economic Accounting Ecosystem Accounting (SEEA-EA) guidance – a spatially-based, integrated statistical framework.

The accounts present:

- the size of the habitat (extent)
- indicators of the habitat conditions, or the health of the habitat (which the SEEA-EA defines as "the quality of an ecosystem measured in terms of its abiotic and biotic characteristics")
- the annual quantity and value of services supplied from ecosystem services provided by nature (physical and monetary ecosystem service flow accounts)
- the value of the ecosystem services as an asset, which is the stream of services expected to be provided over the lifetime of the asset (monetary asset account)

Most of the ecosystem service data presented in our habitat accounts are taken directly from our annual UK natural capital accounts. Quality and methods information for these services are not included here but can be found in our UK natural capital accounts quality and methods guide. More information on the service estimates that are taken from our UK natural capital accounts is available in Section 3: What the statistics cover.

In this guide, we provide quality and methods information for ecosystem services estimates that are not taken from our annual UK natural capital accounts. For the condition accounts, we present information for indicators from our three most recent habitat accounts, these being woodlands (2024), marine and coastal margins (2025) and enclosed farmland (2026).

The estimates reported in our Habitat natural capital accounts bulletins are official statistics in development. For more information, see Section 6: Quality of the statistics.

2 . Latest changes to quality and methods

We updated this guide on 8 July 2026. Important changes to quality and methods include:

- expanded coverage of urban heat regulating estimates
- changes to the return to produced assets calculation
- changes to our enclosed farmland natural capital accounts
- producing a new time series for our latest habitat accounts (the new time series should not be compared with the time series for previous releases because of the ongoing development of our methodologies)

For more information on latest, past and upcoming changes, go to Section 7: Changes and their effects on comparability over time.

3 . What the statistics cover

Habitat classifications

We use the broad habitat classifications from the 2011 UK National Ecosystem Assessment to categorise habitats. Each ecosystem service is allocated to one or more of eight broad habitats. If we are unable to allocate an ecosystem service to a habitat, this is classed as "other".

A detailed description of each habitat classification is available in each of our habitat natural capital account bulletins.

Habitat extent mapping

The mapping data for these habitats are from the UK Centre for Ecology and Hydrology's (UKCEH's) Land Cover Maps. Each of the 21 Land Cover Map habitat classes are assigned to eight broad habitat mapping classes. There are some differences between these mapping classes and the 2011 UK National Ecosystem Assessment.

To calculate the area of each of our broad habitats' mapping classes, we use the dominant land cover parcel data. This means that each parcel of land may contain more than one land cover type, however, we assign the entire area of a land parcel to the dominant land cover habitat.

Enclosed farmland

Enclosed farmland includes arable, horticulture and improved grassland. It includes annual crops, perennial crops such as berries and orchards, freshly ploughed land, and higher productivity grasslands.

Woodland

Woodland includes managed plantations, ancient and semi-natural woodland, and both coniferous and broadleaf (deciduous) woodland.

Coastal margins

Coastal margins include saltmarsh, littoral rock, littoral sediment, supralittoral rock, and supralittoral sediment. Littoral areas are on the shoreline and supralittoral areas are the splash zone above the high-tide mark.

Marine

This broad habitat is saltwater. In our UK accounts, we only show total extent of the seven broad terrestrial habitats. We include marine to show habitat changes between 1990 and 2024, where a terrestrial habitat has become marine, or a marine habitat has become terrestrial.

Mountains, moorland, and heath

Mountains, moorland and heath include heather, heather grassland and inland rock. These are mountainous, open, and rugged habitats.

Semi-natural grassland

Semi-natural grassland includes acid grassland, calcareous grassland (where the geology below is composed of calcium carbonate), and neutral grassland. These are acidic, alkaline, and neutral habitats, respectively, with low levels of plant species diversity.

Urban

Urban includes suburban and urban habitats, consisting of built structures and other infrastructure.

Freshwater, wetlands, and floodplains

Freshwater, wetlands, and floodplains include fen, bog, and freshwater. Freshwater bogs are partly drained habitats, including ericaceous (acidic composition) and herbaceous mosses that form over peat-rich soils.

Ecosystem services

The habitat natural capital accounts provide estimates for ecosystem services calculated at a habitat-specific level. Each of these is grouped into one of three types of ecosystem service: provisioning service, regulating service, or cultural service. Estimates used in our habitat accounts for the following services are taken from the latest UK natural capital accounts at the time of each habitat account's release:

- agricultural biomass provisioning (enclosed farmland accounts, 2026)
- fish provisioning (marine and coastal margins accounts, 2025)
- minerals and metals provisioning (marine and coastal margins accounts, 2025)
- oil and gas provisioning (marine and coastal margins accounts, 2025)
- renewable electricity provisioning (enclosed farmland accounts, 2026; marine and coastal margins accounts, 2025)
- timber provisioning (woodland accounts, 2026)
- woodfuel provisioning (woodland accounts, 2026)
- air pollution regulating (enclosed farmland accounts, 2026; woodland accounts, 2026; marine and coastal margins accounts, 2025)
- greenhouse gas (GHG) regulating (enclosed farmland accounts, 2026; woodland accounts, 2026)
- noise regulating (woodland accounts, 2026)
- urban heat regulating (woodland accounts, 2026)
- recreation (health benefits) (enclosed farmland accounts, 2026; woodland accounts, 2026; marine and coastal margins accounts, 2025)
- recreation and tourism (expenditure) (enclosed farmland accounts, 2026; woodland accounts, 2026; marine and coastal margins accounts, 2025)

Full details of each of these services can be found in our UK natural capital accounts quality and methods guide.

Our habitat accounts also include estimates for some ecosystem services that do not appear in our UK natural capital accounts. These are:

- the flood regulating service (woodland accounts, marine and coastal margins accounts)
- the GHG regulating service for sublittoral sands, sublittoral mud, saltmarsh and seagrass (marine and coastal margins accounts).

We also include information on the GHG regulating service that is particularly relevant to our enclosed farmland habitat accounts.

Details of these services can be found in Section 4: Where the data come from.

Habitat condition indicators

Ecosystem condition accounts provide a structured approach to recording and aggregating data that describe the characteristics of ecosystem assets and how they have changed.

The first step in compiling suitable condition indicators for a habitat is to define and select ecosystem characteristics and associated variables. This means looking at characteristics that can show a directional change over consecutive accounting periods in a scientifically robust way. We also need to collect data on stable characteristics.

Ecosystem condition typology

The ecosystem condition typology (ECT), recommended by the United Nations (UN) System of Environmental-Economic Accounting Ecosystem Accounting (SEEA-EA) guidance, is a hierarchical typology for organising data on the condition characteristics. The typology includes three sets of ecosystem characteristics:

Abiotic (physical) ecosystem characteristics

These include:

- physical state characteristics – for example, soil structure and water availability
- chemical state characteristics – for example, soil nutrient levels, water quality, and air pollutant concentrations

Biotic ecosystem characteristics

These include:

- compositional state characteristics – for example, species-based indicators
- structural state characteristics – for example, vegetation, biomass, and food chains
- functional state characteristics – for example, ecosystem processes and disturbance regimes

Landscape-level characteristics

These include:

- landscape and seascape characteristics – for example, landscape diversity, connectivity, fragmentation, and embedded semi-natural elements in farmland

Our 2025 and 2026 woodland natural capital accounts were data only releases and did not include condition accounts. Condition information was included in:

- our Enclosed farmland natural capital accounts, UK: 2026 bulletin
- our Woodland natural capital accounts, UK: 2024 bulletin
- our Marine and coastal margins natural capital accounts, UK: 2025 bulletin

Geographic coverage and granularity of the statistics

Ecosystem services are produced at the UK level and at England, Scotland, Wales, and Northern Ireland level, unless otherwise stated.

Data from each country are used to produce each ecosystem service's country-level estimates, unless specified in this guide. Where data specific to a country (for example, data from Scotland) are not available, the country-level estimates for that country are imputed or estimated from the countries where data are available.

For ecosystem services where comparable data are not available, we calculate country-level monetary values by subtracting the Scotland value, which is available, from the UK value, and apportioning the residual to England, Wales, and Northern Ireland. These ecosystems are:

- agricultural biomass provisioning
- minerals and metals provisioning
- renewable electricity provisioning

For oil and gas provisioning in our marine and coastal margins accounts, production in Wales and Northern Ireland is assumed to be zero, because there is minimal oil and gas extracted in these countries. We provide physical flow and monetary values for oil and gas provisioning for the UK and Scotland. England values are assumed to be the remainder, when Scotland values are deducted from the UK value.

Some ecosystem services are produced at a greater granularity than country level. These include:

- air pollution regulating physical flows, annual, and asset values, which are produced on a local-authority basis
- GHG regulating physical flows, annual, and asset values, which are produced on a local-authority basis (except for marine and coastal margins habitats, which are produced at UK level)
- urban heat regulating, annual and asset values, which are produced for local authorities in Great Britain

Condition data depend on availability. For this reason, the same data may not be available for all habitats or countries. Because of the complexity and abundance of condition data, we explain which habitats and countries the data are available for in the Condition subsection of Section 4: Where the data come from.

Availability of statistics over time

The first year for which statistics are available for each ecosystem service included in our habitat accounts varies. More information on the availability for the ecosystem services estimates taken from our UK natural capital accounts and used in our habitat accounts, is available in our UK natural capital accounts quality and methods guide (QMG).

Our condition indicators also vary in availability through time. We note the start dates and end dates of these indicators in the relevant condition indicator sections of this QMG.

4 . Where the data come from

Extent

Data sources on extent include:

- the Joint Nature Conservation Committee's (JNCC's) UK Atlas of Seabed Habitats: combined map v2025.1 for marine and coastal margins habitats
- Forest Research's forestry statistics on Woodland area by ownership, UK, 1998 to 2025 for woodland habitats
- the UK Centre for Ecology and Hydrology's Land Cover Maps for enclosed farmland (1990 and 2024)

Condition

Condition indicators cover a range of data and sources that vary between habitats. Data sources can be accessed through our:

- our Enclosed farmland natural capital accounts, UK: 2026 detailed summary tables
- our Woodland natural capital accounts, UK: 2024 detailed summary tables
- our Marine and coastal margins natural capital accounts, UK: 2025 detailed summary tables

Ecosystem services

Further information on data sources for the ecosystem services data taken from our UK natural capital accounts, and used in our habitat accounts, is available in our UK natural capital accounts quality and methods guide.

The following services are not currently included in the UK natural capital accounts, and are assigned to a specific habitat.

Greenhouse gas regulating for sublittoral sands, sublittoral mud, saltmarsh and seagrass (marine and coastal margins accounts)

Data sources include:

- extent data for sublittoral sand and mud from the JNCC's UK Atlas of Seabed Habitats Combined Map, 2025
- extent data for saltmarsh and seagrass, and habitat-specific physical flow data from the Scottish Association for Marine Science, University of St Andrews, and the Marine Biological Association's UK's Blue Carbon Inventory: Assessment of Marine Carbon Storage and Sequestration Potential in UK Seas (Including Within Marine Protected Areas) (PDF, 6.6MB)
- the Department for Energy Security and Net Zero's projected non-traded price of carbon schedule in Data Table 3 of their Green Book supplementary guidance: valuation of energy use and greenhouse gas (GHG) emissions for appraisal for annual value calculations

Flood regulation (marine and coastal margins accounts)

Data sources include:

- Agricultural input price index data from the Department for Environment, Food and Rural Affairs (Defra)
- Cropland and livestock flooding costs from the Farmland business survey, published by Defra
- Land Cover Maps from the UK Centre for Ecology and Hydrology
- Mapping of Groundflood Properties from Ordnance Survey

Flood regulation (woodland accounts)

Data sources include:

- Forest Research data on the valuation of flood regulation from woodland

5 . How we produce the statistics

Ecosystem services

In our accounts, ecosystem services estimate the contribution of natural assets in different habitats to the UK's economy and society. The following ecosystem services (with the habitat accounts releases in which they are published named in brackets) are taken from our UK natural capital accounts:

- agricultural biomass provisioning (enclosed farmland accounts)
- fish provisioning (marine and coastal margins accounts)
- minerals and metals provisioning (marine and coastal margins accounts)
- oil and gas provisioning (marine and coastal margins accounts)
- renewable electricity provisioning (enclosed farmland accounts, marine and coastal margins accounts)
- timber provisioning (woodland accounts)
- woodfuel provisioning (woodland accounts)
- air pollution regulating (enclosed farmland accounts, woodland accounts, marine and coastal margins accounts)
- greenhouse gas (GHG) regulating (enclosed farmland accounts, woodland accounts)
- noise regulating (woodland accounts)
- urban heat regulating (woodland accounts)
- recreation (health benefits) (enclosed farmland accounts, woodland accounts, marine and coastal margins accounts)
- recreation and tourism (expenditure) (enclosed farmland accounts, woodland accounts, marine and coastal margins accounts)

Each of these services are produced using a Python script that links data sources to produce physical flows and monetary estimates.

Section 3: Where the data come from and how we produce the statistics of our UK natural capital accounts quality and methods guide (QMG) provides further information on:

- annual ecosystem service flow valuations
- resource rent definition and assumptions
- asset valuations
- rounding
- extent

For the flood regulating and GHG regulating services (marine and coastal margins) we use different methods to process the data. These are explained in the following sections.

We carry out quality assurance checks at every stage of the process, these are described in the How we quality assure the data and statistics subsection of Section 6: Quality of the statistics.

GHG regulating for the enclosed farmland habitat

GHG regulating estimates the value of the removal of GHGs, in carbon dioxide equivalent (CO_2e), from the atmosphere by habitats in the UK. The methods used to estimate the physical and monetary values of this service for the enclosed farmland habitat are the same as for our UK natural capital accounts, as described in our UK natural capital accounts QMG.

There are some limitations to the approach used to calculate GHG regulation, which are particularly relevant to the enclosed farmland habitat.

Firstly, the current inventory method focuses on primary land-use transitions and does not account for agricultural rotations, which may lead to differences between nations, depending on dominant farming systems.

Secondly, cropland emissions largely reflect historical land use change rather than current management practices.

In addition, we map grassland mineral soils under land use change (LUC) from Territorial Emissions Statistics (TES) to semi-natural grassland. However, grassland systems that are enclosed and actively managed for agricultural production are also a core part of agricultural land use. For this reason, we might underestimate some land-based emissions in this habitat

Soil classifications are not always clear-cut in practice. In particular, the distinction between peat and mineral soils can be difficult to apply consistently, which may contribute to differences between nations. For example, high organic soils in Scotland may be included in the analysis, whereas similar soils in England may be excluded if classified as peatland, leading to the statistics for Scotland showing higher mineral soil carbon losses from LUC to cropland.

Greenhouse gas regulating for marine and coastal margins habitats

The greenhouse gas regulating service in marine and coastal margins habitats in the UK estimates the value of the removal of greenhouse gases, in CO_2e, from the atmosphere, by:

- living organisms, such as seagrass species that capture, process and bury carbon dioxide (CO_2)
- abiotic (physical and non-living) ecosystems, such as subtidal muds and sands, which also sequester carbon
- saltmarsh ecosystems, which are intertidal coastal ecosystems with vascular plant species and sequestrating sediments that are effective at capturing carbon

To estimate the value of this service we use the extent in hectares of four habitat types:

- sublittoral sand
- sublittoral mud
- saltmarsh
- seagrass

For sublittoral sand and mud, we calculate extent values using data from the Joint Nature Conservation Committee's (JNCC's) UK Atlas of Seabed Habitats Combined Map, 2025.

For saltmarsh and seagrass, we use extent values from the UK's Blue Carbon Inventory (UKBCI): Assessment of Marine Carbon Storage and Sequestration Potential in UK Seas (Including Within Marine Protected Areas) (PDF, 6.6KB).

For physical flows, we take habitat-specific sequestration rates from the UKBCI and multiply them by the extent for each of the four habitat types. This enables us to calculate the amount of CO2e sequestered each year. Given the wide variation in the literature for carbon sequestration rates, we present three sets of values using higher (maximum), lower (minimum) and average rates.

To estimate the annual values (minimum, maximum and average), we multiply the physical flows by a carbon price. The carbon price used in calculations is based on the projected non-traded price of carbon schedule. This schedule is published in Data Table 3 of the Green Book supplementary guidance published on GOV.UK. Carbon prices are available from 2020 to 2050. Prices before 2020 and beyond 2050 are deflated or inflated, respectively, by 1.5% annually, based on the Department for Energy Security and Net Zero's (DESNZ's) advice.

These data are available from 2020 to 2024.

Flood regulating

Flood regulating estimates the value of saltmarsh in mitigating coastal flooding. As our methodology remains under development, these estimates should be treated as experimental.

The estimates used in our marine and coastal margins habitat accounts for this service are based on the 2019 data from our Saltmarsh flood mitigation in England and Wales, natural capital: 2022 bulletin. The methodology we use for estimating the physical extent of saltmarsh flood mitigation in England and Wales is described in our Saltmarsh flood mitigation methodology.

To capture the flood regulating service for woodland in Great Britain in our woodland natural capital accounts, we use the method developed by Forest Research for valuing flood regulation services. This examines how much it would cost to have flood water storage (reservoirs) in an area where there is no woodland. They looked at the substitution costs of having no woodland. For Northern Ireland, Forest Research estimated the annual and asset values.

Physical and chemical condition indicators

Nitrogen and Phosphorus for the enclosed farmland habitat

We take the values for nitrogen and phosphorus input and offtake from the Department for Environment, Food and Rural Affairs (Defra) Soil nutrient balances data. Defra produces these data using methods developed by the Organisation for Economic Cooperation and Development (OECD). The data produced by Defra is for "all farms" from 2000 to 2009, and for "commercial farms" (those with an agricultural output worth £21,000 or more per year) from 2009 to 2024. We present only data for commercial farms, as it is comparable within the time series.

Emissions on agricultural land

We take emissions on agricultural land data from Chapter 11: Agri-Environment of Defra's Agriculture in the United Kingdom 2024 report. This report is derived from data produced by the Department of Energy Security and Net Zero (DESNZ), and by Defra. It is available from 1990 to 2023.

In our figures, we present these data as indices, by dividing the mass of emissions in a year by the mass of emissions in 1990, our reference year, and multiplying it by 100. This means that values indicate the percentage difference between a year and the reference year.

Soil health for the enclosed farmland and woodland habitats

Soil is important for providing many essential ecosystem services, such as food production, water purification and greenhouse gas regulation. We present trends in the following soil indicators:

- mean carbon concentration
- pH (indicative of soil acidity)
- bulk density (indicative of soil compaction)
- topsoil carbon stock (calculated as a product of carbon concentration and bulk density)
- plant-available phosphorous (Olsen P)

Monitoring trends in specific soil indicators over time provides a suitable physical state condition indicator.

Data for these indicators are from:

- the UK Centre for Ecology and Hydrology (UKCEH) Countryside Survey of Great Britain
- the Environment and Rural Affairs Monitoring and Modelling Programme

These surveys were conducted in 1978, 1998, 2007, and in a multi-year sampling period from 2019 to 2023. For more information on soil health metrics, please see the Soil structure evidence synthesis report (PDF, 2.4MB) from the Royal Society.

Water Framework Directive for the marine and coastal margins habitat

The Water Framework Directive is used to represent the quality of bodies of water in the UK. Water bodies are assessed according to the directive and reported through the Joint Nature Conservation Committee (JNCC) and the Department for Environment, Food and Rural Affairs (Defra). Please see the UK Biodiversity Indicators surface water status on the JNCC website for more details on methodology for the source data.

Coastal bathing waters for the marine and coastal margins habitat

Samples are collected from designated bathing water sites around England and Wales by the Environment Agency, which are monitored weekly from early May to the end of September. These are published on the Environment Agency's Bathing water quality application programming interface (API).

In Scotland, samples are collected weekly by the Scottish Environment Protection Agency (SEPA) from 15 May to 15 September each year.

In Northern Ireland, the Department of Agriculture, Environment and Rural Affairs (DAERA) tests water quality on 20 different occasions from June to mid-September.

These samples are tested for indicators of water cleanliness and safety, such as concentration of faecal matter and potentially infectious bacteria, such as Escherichia coli (E. coli).

Several sites were not tested in 2020 because of the coronavirus (COVID-19) pandemic and related restrictions, including all sites in England and Scotland. Data from 2015 to 2020 were provided by the European Environmental Agency.

Plastic particles in sea sediment for the marine and coastal margins habitat

Deep-sea sediments are a likely sink for microplastics. While there is not yet an agreed safe or unsafe threshold for microplastic concentrations in UK sea sediments, microplastics are damaging to marine ecosystems. Recent research has shown that they can cause damage to the health of marine organisms (this article includes pay-to-access content), and become present in fish consumed by humans.

The Centre for Environment, Fisheries and Aquaculture Science (Cefas) collected sediment samples from the top two to three centimetres of the seafloor. They digested organic matter to isolate the microplastics and analysed them. A process called Micro-Fourier Transform infrared spectroscopy was used to analyse the microplastics. These data are available from 2013 to 2021. More information on the methodology and data available is available in the Microplastics data in UK (England and Wales) seafloor sediments from 2013 to 2021 dataset from Cefas.

The number of particles per dry mass is standardised to number of particles per kilogramme of dry mass. We present these, indicating whether samples were taken from a sea to the east or west of Great Britain.

Sea temperature and sea surface temperature for the marine and coastal margins habitat

Sea temperatures can indicate the response of marine ecosystems to stressors such as climate change, and the ability for marine ecosystems to support temperature-sensitive species.

Sea temperatures for England and Wales were collected by Cefas in their Coastal Temperature Network Data 1892 to 2018 and by other suppliers, from the sea surface, several times per month. This data collection was discontinued in 2018.

Sea temperatures for Northern Ireland were collected by DAERA. These were recorded at various depths every three hours. We used the sea surface and seabed temperatures for the Northern Ireland data. More information is available in Section 4: Water and Marine, of DAERA's Northern Ireland Environmental Statistics Report (PDF: 4.0MB)

We then used the annual average temperature to plot the change in average sea surface or seabed temperature from 1996 to 2018 for England and Wales, and from 1996 to 2023 for Northern Ireland.

Compositional species condition indicators

Species indicators reflect habitat health, both through the diversity of species present in the habitat (which indicates its resilience) and the health of populations of keystone and protected species.

Bats on enclosed farmland and woodland habitats

Bats depend on a range of habitats, and in the UK are reliant on insect prey. They are good indicators of habitat condition as they are sensitive to changes in land use, habitat fragmentation, climate, and site management.

The National Bat Monitoring Programme (NBMP), run by the Bat Conservation Trust (BCT), coordinates annual bat surveys. Volunteers monitor bats at survey points and along walks by listening for their vocalisations using specialised equipment. The monitoring sites and walks have been mapped against habitat maps to enable us to break it down by broad habitat.

The detection distance of bats means that the bats recorded may not be at the exact location of the recording point. A "buffer" is placed around each recording point based on the approximate maximum detection distance for each species. These are:

- Daubenton's bat – 10 metres (m)
- common pipistrelle and soprano pipistrelle – 25m
- noctule – 100m

Indices for each species are based on spots or walks where at least 50% of the buffer area was of the relevant habitat.

The Bat Conservation Trust uses different species of bat to indicate bat population health for different habitats. They use Daubenton's bat for freshwater environments, and the common and soprano pipistrelles and the noctule for all other habitats.

Generalised Additive Models (GAM) are used to fit a smoothed line to each bat dataset, with full details on the statistical methods used in the NBMP's annual report.

Our data for bats are available from 1998 to 2024.

Bees on enclosed farmland and woodland habitats

Bees provide a range of ecosystem services, as well as being useful indicators of wider ecological health, and are one of the main groups of insects responsible for the pollination of wildflowers, berries, orchards and crops. Because a third of all UK crops are pollinator dependent, this is a particularly important service. Habitat loss and degradation is related to declines in bee populations, making them a useful indicator of long-term changes in the condition and health of the environment.

The Bumblebee Conservation Trust runs the BeeWalk Survey Scheme. This uses citizen volunteers to monitor the number of bumblebees and honeybees on a monthly walk from March to October, along a set route of approximately one mile. This identifies worker bees (the most common), drones (males) and queens (the sole fertile female in any colony). The number of bees per kilometre is counted and reported over time. Data for bumblebees are available from 2008 to 2025, and data for honeybees are available from 2010 to 2025.

We organise these data by calculating the average total number of bumblebees and honeybees per kilometre walked. We also calculate the total number of queen bumblebees and queen honeybees per kilometre. As honeybees are a managed, domesticated species, queen honeybees are much rarer than queen bumblebees.

Birds on enclosed farmland, woodland, and marine and coastal margins habitats

Bird populations measured by the JNCC provide a useful indicator of the state of UK nature, as birds occupy a wide range of habitats and respond to environmental pressures.

The habitat-based Wild bird populations are accredited official statistics produced by the Royal Society for the Protection of Birds (RSPB) and the British Trust for Ornithology (BTO), under contract to Defra and the JNCC. These data are available from 1970 to 2024.

The data used to produce these indicators come from a range of surveys and sources. Species are selected for the indicator if they have a population of at least 300 breeding pairs and are a native species, and if they are associated with the relevant habitat based on The New Atlas of Breeding Birds in Britain and Ireland by Gibbons and others in 1994. More information about how bird populations are counted, and the sources of the data is available in the BTO's breeding bird survey web page and Defra's technical report paper on the production of these indicators.

Butterflies on enclosed farmland and woodland habitats

We take data for this indicator from the JNCC's UK Biodiversity Indicators, Insects of the wider countryside (butterflies) publication.

This indicator covers three measures of annual butterfly population abundance in the UK. JNCC creates a multi-species indicator from all species of butterflies, which are assigned to one of two groups, based on their associated habitat: "farmland butterflies" or "woodland butterflies". For each of these habitats, associated species may be habitat generalists (able to exploit many habitats) or habitat specialists (primarily reliant on their associated habitat). These data are available from 1990 to 2024.

Plants on enclosed farmland habitat

Plant populations are important, as they provide ecosystem services and form the environment in which most other species exist. Data for this indicator are from the JNCC's UK Biodiversity Indicators 2025, Plants of the wider countryside in the UK publication. They are available from 2015 to 2024.

This indicator measures change in the abundance of wild plant species considered indicative of good habitat condition in the UK, using modelled abundance data from National Plant Monitoring Scheme (NPMS) plots. These plant species are each associated with particular habitats, including arable, broadleaved woodland and hedges.

Harbour seals and grey seals on marine and coastal margins habitat

Harbour and Grey seals are protected under the Conservation of Seals Act 1970 and the Marine (Scotland) Act 2010. Seal population data were provided by the Sea Mammal Research Unit (SMRU) Special Committee on Seals (SCOS) at St. Andrews University. Seal populations were counted at haul-out sites, where seals come to land to rest and breed. Records from monitoring units are aggregated to produce counts for the entire UK, which we then plot. These data are available from 2000 to 2021.

Structural condition indicators

Arable land use for the enclosed farmland habitat

We take the data for this indicator from Defra's Agricultural land use in the UK dataset. These data are available from 2011 to 2025.

Statutory plant health notices for the woodland habitat

We include data on the total number of Statutory Plant Health Notices (SPHN) issued and the area affected. The notices are instructions to take action, such as felling, when trees on a site are found to be infected with pests or disease. Different bodies are responsible for issuing these notices in each country. Chapter 1.7: Felling of Forest Research's forestry statistics (PDF, 862KB) publishes data on the number of sites issued with SPHNs and the number of fellings carried out as the result of a SPHN. These data are available from 2013 to 2023.

Invasive species on marine and coastal margins and woodlands habitats

Invasive non-native species can have negative consequences on the health and resilience of ecosystems. Some such species may outcompete native species, creating negative impacts on food chains, or cause physical damage.

We use data from JNCC on the number of invasive species in the marine environment, which form part of the UK Biodiversity Indicators (UKBI). Invasive species were selected as non-native species, which are known to have, or may potentially have, a negative ecological effect, and which have established in 10% or more of Great Britain's land or coastline. These data are available from 1969 to 2023.

For the woodland habitat, we use data from the National Forest Inventory (NFI) survey, which is based on data collected between 2009 and 2015 in Great Britain. More than 15,000 one-hectare squares were sampled, recording data for 15 woodland ecological condition indicators at each survey site. Results are published in the NFI's Woodland ecological condition in Great Britain methodology. The conditions are then classed as favourable, intermediate, or unfavourable. More information on the methodology is available in Forest Research's NFI survey methods.

Scallop fishing (seafloor integrity) for the marine and coastal margins habitat

Most scallop fishing is from seafloor dredging, which damages the seabed. The amount of scallop fishing can indicate seafloor integrity, with high scallop fishing reflecting low seafloor integrity.

We take scallop fishing numbers from our UK natural capital accounts, and data are available from 2016 to 2022. Section 3: Where the data come from and how we produce the statistics of our UK natural capital accounts quality and methods guide has full details on the data collected and methods.

Aggregate dredging for the marine and coastal margins habitat

Aggregate dredging is the process by which sand and gravel are dredged from the seafloor. This is a valuable resource but has the potential to damage seafloor integrity. We use data from The Crown Estate on marine aggregate extraction operations, which over the last two decades (2001 to 2022) have been monitored with an electronic monitoring system (EMS). Details on data and methodology are available in the 2022 Area Involved Report from the Crown Estate (PDF, 3.8KB).

Landscape and Seascape condition indicators

Hedgerows for the enclosed farmland habitat

Hedgerows are important habitats for biodiversity and provide habitat connectivity.

A hedgerow, or hedge, is a line of woody or shrubby vegetation which is managed to alter its natural shape. Hedgerows:

- provide windbreaks which prevent soil erosion and protect crops
- provide habitats for wildlife (especially pollinators such as bumblebees, butterflies, and insects that need hedge banks)
- provide shelter for wildlife (for example, birds)
- reduce flooding
- improve air quality; a hectare of hedgerows between 3.5m and 6m wide could sequester as much as 131.5 tonnes of carbon per year

The Department for Environment, Food and Rural Affairs (Defra) Hedgerow survey handbook defines a hedgerow as any boundary line of trees or shrubs over 20m long and less than 5m wide at the base.

The Woodland Trust Hedgerows and Hedgerow Trees report estimates that half of all hedgerows were lost from the countryside during the 20th century.

The UKCEH Countryside Survey provides hedgerow data for 1984, 1990, 1998, and 2007, covering:

- coastal areas
- farmland
- mountains, moorland, and heath

These data are presented as mean lengths for seven different feature categories, based on the Institute of Terrestrial Ecology (ITE) Land Classification 1990. We use the "hedges" metric.

For England, we provide additional data for a sampling period of 2022 to 2023, calculated by the UKCEH to be comparable with the Countryside Survey data. More information on their methodology can be found in Defra's Evaluation of agri-environment scheme impact on hedgerows in England report.

For Wales, we are able to provide data for a sampling period of 2013 to 2016, and for a sampling period of 2021 to 2023. These come from the Environment and Rural Affairs Monitoring and Modelling Programme (ERAMMP), which may not be directly comparable with the Countryside Survey data. More information on the methodology can be found in the Supplement-3: Vegetation of the ERAMMP technical annex (PDF, 4.6MB).

Woodland on farmland in enclosed farmland and woodland habitats

We use data collected by the Department for Environment, Food and Rural Affairs (Defra) on the size and structure of the agricultural industry in the UK, including the area of woodland on farmland. More information is available in Defra's Agriculture in the UK collection. These data are available from 1984 to 2025.

Habitat connectivity for the woodland habitat

Habitat connectivity measures the ease of different species' movement between landscape habitats. For the purposes of our statistics, we use the definition from Philip D. Taylor and others' article Connectivity is a vital element of landscape structure, (this article includes pay-to-view content). Taylor defines habitat connectivity as "the degree to which the landscape facilitates or impedes movement among resource patches".

Connectivity can be structural (about the distribution of patches of habitat across a landscape). It can also be functional (about the ability of species to move around different habitat patches). For example, birds might functionally move across a naturally structurally fragmented set of habitats many miles or even thousands of miles apart, while some terrestrial mammals may struggle if a single road crosses their habitat.

According to the JNCC's work on calculating habitat connectivity, it is important to calculate functional connectivity, which is the ability of species to move between resource patches in the landscape. The indicator uses a measure of population synchrony of 33 butterfly and 29 woodland bird species in the UK. Data are available from 1985 to 2012.

Seagrass abundance in marine and coastal margins

Seagrass meadows are an important marine habitat, providing a home and nursery ground for many marine species, and carbon sequestration services. Seagrass abundance data represent ground-truthing monitoring for the ecological assessment of seagrasses within transitional and coastal waters of England and Wales.

We use data collected and owned by the Environment Agency, which monitors seagrass between June and September. The data we present are from 2008 to 2023.

Environmental pressure condition indicators

Wildfires on enclosed farmland and woodland habitats

Wildfires can be an indicator of pressure on ecosystems and ecosystem health. Most wildfires in the UK are started by human action, with or without intent. Fire and rescue incident statistics from the Ministry of Housing, Communities and Local Government (MHCLG) classify wildfire incidents primary (most serious) or secondary (small and low risk).

We use data for England from the MHCLG's Outdoor fires dataset. Information on how these statistics are produced is available in the MHCLG's guidance document.

We use data for Wales from the Welsh Government's Grassland, woodland and crop fires statistics. These are compiled from reports submitted by all three Fire and Rescue Authorities in Wales.

We use data for Scotland from the Scottish Fire and Rescue Service's Incident Statistics, which are uploaded to the Incident Recording System.

In our enclosed farmland natural capital accounts for Scotland, we use grassland and crop fires, as these are grouped in the original dataset. We use only primary fires, as this is the only category that includes cropland. For Wales and England, we use grassland, woodland and crop fires, as these are grouped in the original datasets. We combine primary and secondary fires, as both include fires on cropland. We present all three nations as financial years, and present data from between financial year (FY) 2009 to 2010 and FY 2024 to 2025 for Scotland and Wales, and from between FY 2010 to 2011 and FY 2024 to 2025 for England.

In our marine and coastal margins natural capital accounts, we take wildfire occurrence data from the Incident Recording System for both England and Wales. These are provided by the Home Office and processed by the Forestry Commission for England, and StatsWales for Wales. For England, we use wildfire instances on coastal margins for land cover map classes, and present data from between FY 2009 to 2010 and FY 2020 to 2021. For Wales, we use the beach habitat, and we present data from between FY 2009 to 2010 and FY 2021 to 2022.

Fly-tipping on woodland and enclosed farmland habitats

Fly-tipping is an indicator of pressures on ecosystems, as it poses a risk to human and ecosystem health. Our fly-tipping data is for England and Wales only. For England, we use Defra's Fly-tipping statistics for England datasets . These data are available broken down by some habitats, specifically:

- agricultural (equivalent to enclosed farmland)
- watercourses (equivalent to freshwater)

Because of changes to Defra's methodology, data for FY 2019 to 2020 cannot be compared with data from previous years. We present data from between FY 2007 to 2008 to FY 2024 to 2025.

For Wales, our data come from StatsWales Fly-tipping data. These data are recorded by land use type, which allows us to break them down by habitat. We present data from between FY 2006 to 2007 and FY 2024 to 2025.

Herbivore damage on woodland habitat

We use data for herbivore damage from the National Forest Inventory (NFI) survey, which is based on data collected between 2009 and 2015 in Great Britain.

Marine protected areas

The extent of marine protected areas can indicate the amount of marine habitat experiencing reduced environmental pressures and exploitation. We use data collected by the JNCC's UK Biodiversity Indicators (UKBI) . The data are derived from the net area of a range of types of protected areas, including Marine Conservation Zones and Nature Conservation Marine Protected Areas. We can present data from 1950 to 2024.

Storm overflows for the marine and coastal margins habitat

Spills from storm overflows indicate extreme weather events and pollution of marine environments and waterways that can have a negative impact on ecosystem health.

Event Duration Monitoring (EDM) allows water and sewerage companies to track the frequency and duration of spilling events. Data are submitted by these companies annually to:

- Natural Resources Wales
- the Environment Agency for England
- the Scottish Environment Protection Agency.

We analyse the submitted data, which includes the frequency and duration of spills. We present data from 2021 to 2024.

Further information on the data and the methods used to collect it is available on:

- Dr Cymru (Welsh Water) for Wales
- the Environment Agency for England
- Scottish Water for Scotland

6 . Quality of the statistics

Statistical designation

These statistics are labelled as "official statistics in development". They are based on information from multiple data sources. We are developing how we collect the data and produce the statistics to improve their quality.

Once we have completed the developments, we will review the statistics with the Statistics Head of Profession.

If the statistics meet trustworthiness, quality and value standards based on user feedback, we will remove the "official statistics in development" label to publish under the "official statistics" label.

If they do not meet trustworthiness, quality and value standards, we will further develop them.

We will inform users of the outcomes of our, and any OSR, reviews and any changes.

We are working towards improving the quality of our Natural Capital Accounts statistics to achieve accredited official statistics status, as described in Annex C3.4: Environmental economy of our Plan for ONS economic statistics report.

How we quality assure the data and statistics

We perform quality assurance at each stage of the statistical production process, by following these steps.

1. We validate data that we input from the various data sources outlined in Section 5: How we produce the statistics.
2. We analyse any changes and revisions in the source data, querying any unexpected changes.
3. Once these input data are checked, we run code for services produced using a Python script, or manually compile outputs for non-coded services.
4. We quality assure our outputs to ensure that the statistics appear appropriate compared with previous years, and with recent economic and environmental trends.
5. We consult with condition data providers to confirm that both our interpretation of their data and how we use it to produce our outputs are correct.
6. After producing our detailed and summary data tables, we carefully quality assure them, along with commentary included in our Habitat natural capital accounts bulletins.
7. Once the bulletin and data tables are complete and quality assured, they are circulated internally for feedback.
8. Environmental and national accounts experts and subject-matter experts within government peer review our data tables and new methods; this allows us to gather feedback and use their knowledge and expertise to inform our final outputs.

Strengths and limitations

Strengths

- Our habitat accounts follow the United Nations (UN) System of Environmental-Economic Accounting Ecosystem Accounting (SEEA-EA) guidance where possible; more information on the principles underpinning the accounts is in our Principles of UK natural capital accounting: 2023 methodology.
- We include condition indicators in our habitat accounts, allowing us to provide a fuller picture of the health of ecosystems, beyond ecosystem service and assets.

Limitations

- It is impossible to fully calculate the value of the natural environment in economic terms, as we are limited to the data and methods that are currently available on the appropriate physical and monetary valuations of ecosystem services; our accounts do not provide a complete valuation, and they should be interpreted as a partial or minimum value.

- As we improve our methods and data sources, we also revise our methodology, so our latest accounts should not be compared with previous editions; we are improving our estimates with the aim of achieving accredited official statistics status, after which point, revisions will be more limited.

- It is not always straightforward to interpret a higher or lower annual or asset value in natural capital accounts; for example, if society produces less pollution, trees remove lower quantities of pollutants and this reduces the value of the air pollution regulating ecosystem service, which in turn results in a lower estimate of natural capital – a reduction in pollution would generally be considered a benefit, even if it results in a lower natural capital accounting value.

- Some data for ecosystem services in our habitat accounts are published with a two-year lag after the reference year, because of data availability; some ecosystem services have a smaller (one-year) lag where more timely sources are available.

- Some ecosystem services contain volatile annual values, especially for services where the prices in the market can change rapidly; in particular, prices in the oil and gas market can cause fluctuations in the annual value of oil and gas, while the physical flow and asset values for oil and gas are relatively stable, so we have separated these and other abiotic ecosystem services from biotic ecosystem services in our recent habitat bulletins.

European Statistical System Quality Dimensions

The Office for National Statistics (ONS) has developed Guidelines for measuring statistical quality based on the five European Statistical System (ESS) Quality Dimensions. These are:

- relevance
- accuracy and reliability
- timeliness and punctuality
- comparability and coherence
- accessibility and clarity

We have integrated these considerations into this guide.

7 . Changes and their effects on comparability over time

Latest changes

We implemented several methodological changes in our UK natural capital accounts: 2025 bulletin that affect our habitat natural capital accounts published after this bulletin. These changes are ordered by date, with the most recent first.

Expanded coverage of urban heat regulating estimates (ecosystem services)

This ecosystem service is included in our woodland accounts.

The urban heat accounts are now produced for local authorities (LAs) in Great Britain, using the 2024 boundaries. Other changes also include:

- higher resolution temperature data in hot days calculations
- LA-level gross value added (GVA) data by region
- new air conditioned floorspace data
- updated built-up area boundaries and green and blue space-distance calculations

Changes to the return to produced assets calculation (ecosystem services)

We updated our return to produced assets calculation to better reflect how we capture price changes over time. The new methods to calculate return to produced assets are part of the calculation for annual, and therefore asset, values for:

- agricultural biomass provisioning (enclosed farmland accounts, 2026)
- renewable electricity provisioning (enclosed farmland accounts, 2026)

Our latest accounts cannot be compared with previous accounts because of changing methods and an expanding portfolio of ecosystem services measured. We apply the latest methods developed across all years in our latest accounts to give a consistent time series.

Changes to our enclosed farmland natural capital accounts (condition indicators)

- We divided our bee indicator into bumblebees and honeybees to better represent the species-specific interactions these have with their environments.
- We produced an index of emissions from agriculture to reflect changes in emissions across large scales through time.
- We added an indicator of plant species abundance, to show the health of species beyond animals.

Past changes

Further information on past methodological changes to our ecosystem services, is available in our UK natural capital accounts quality and methods guide (QMG).

Upcoming changes

Our habitat natural capital accounts focus on a different habitat in each publication. In future publications, methods will continue to be updated in line with developments implemented in our annual UK natural capital accounts statistics to help us progress towards achieving accredited official statistic status. Conditions indicators will be updated and, where relevant, expanded, based on data availability. Information on new methodological developments to our UK natural capital accounts will be included in future updates to our UK natural capital accounts QMG.

We will update this QMG with additional information on habitats that are not included here, including:

- urban
- mountains
- moorlands and heath
- fresh water

We will make these updates alongside our future UK habitat natural capital accounts publications.

For the enclosed farmland habitat, we are exploring methods developments to the agricultural biomass provisioning service, to more directly link changes to habitat conditions to changes in the physical flows and between physical flows and monetary values for this ecosystem service.

8 . Comparability and coherence with other statistics producers

In each release, we use a consistent approach and methods across the time series for each of the ecosystem services estimates used in our habitat accounts. This allows users to compare estimates over time and between geographic boundaries for most ecosystem services within the same set of habitat accounts.

Each of our ecosystem services is produced using a unique method that is applied across all estimated years. However, some ecosystem services use data sources that change or are only available in certain years. Users should be aware that some year-on-year changes could be because of modelling changes, rather than real trends from the source data.

Our condition data are produced with the assistance of various data providers to ensure that they are comparable with other statistics producers.

United Nations System of Environmental-Economic Accounting Ecosystem Accounting

Our UK natural capital accounts and habitat natural capital accounts are produced following the guidance in the United Nations (UN) System of Environmental-Economic Accounting Ecosystem Accounting (SEEA-EA) measurement approach. SEEA-EA statistics are broadly comparable with ours, but be aware of the following differences:

- UN SEEA-EA statistics exclude abiotic resources (these are included in the SEEA Central Framework instead); ours include abiotic resources
- UN SEEA-EA statistics include habitat types levels one to three, according to the International Union for Conservation of Nature (IUCN) Global Ecosystem Typology 2.0; ours include broad habitats, according to land cover maps from the UK Centre for Ecology and Hydrology, and are based on the 2011 UK National Ecosystem Assessment
- UN SEEA-EA statistics measure carbon sequestration and storage; ours measure carbon sequestration and emissions
- The UN SEEA-EA recommends that ecosystem services should be valued at zero when a net flux of emissions causes more emissions to be released than removed; we publish negative figures for ecosystem services

9 . Users and uses of these statistics

- The Department for Environment, Food and Rural Affairs (Defra) builds on our natural capital accounts in their Enabling a Natural Capital Approach guidance, which provides guidance to policy- and decision-makers on valuing the natural environment for people and the economy; they also use our statistics to draw out broader policy-relevant lessons in their annual Nature at work for people in the economy report.

- Data are used by policy-makers, such as England Peatland Action Plan.

- Forestry Commission includes data on England's woodland ecosystem asset values in their key performance indicators

- Other users include academics, businesses, researchers, charities, and the media.

10 . Definitions

Annual value

The annual value of a natural asset is a monetary valuation of the ecosystem services stemming from that asset in a given year.

Asset value

Natural capital asset values measure the stock, or the stream of services of that natural resource in terms of future expected supply and use over a reasonably predictable time horizon.

Cultural services

Cultural services are the non-material benefits of interacting with ecosystems through recreation and tourism, and their associated health benefits.

Our habitat accounts include the following cultural services:

- recreation and tourism (expenditure), which estimates the amount spent to enable visits to the natural environment, such as transport, car parking, and admission costs

- recreation (health benefits), which estimates the number of people gaining health benefits from regular recreation and the monetary value associated with this

Physical flow

The physical flow of ecosystem services from a natural asset is the measure of its output in units appropriate to the goods or services.

Provisioning services

Provisioning services refer to tangible goods that people can harvest, extract, or derive from the environment, such as food, energy, and materials.

Our habitat accounts include the following provisioning services:

- agricultural biomass provisioning, which estimates the value of crops, fodder, and grazed biomass provided to support agricultural production
- fish provisioning, which estimates the value of marine fish taken from mainland UK waters
- minerals and metals provisioning, which estimates the value of the extraction of minerals and metals to support production, largely consisting of extraction aggregates
- oil and gas provisioning, which estimates the value of the production of crude oil and gas
- renewable electricity provisioning, which estimates the value of electricity generated from renewable sources like wind, hydroelectric, solar, and wave and tidal
- timber and woodfuel provisioning, which estimates the value of wood production (also referred to as removals), which is the harvesting of roundwood (trunks and branches) from coniferous (softwood) and broadleaved (hardwood) trees

Regulating services

Regulating services help to maintain the quality of the environment we rely on.

Our habitat accounts include the following regulating services:

- air pollution regulating, which estimates the value of the removal of air pollution by habitats in the UK
- greenhouse gas regulating, which estimates the value of the removal of greenhouse gases, in carbon dioxide equivalent (CO_2e), from the atmosphere by habitats in the UK; estimates represent net values of the sequestration and emissions of greenhouse gases.
- noise regulating, which estimates the value of vegetation that acts as a buffer against noise pollution, such as from road traffic
- urban heat regulating, which estimates the value of green spaces (for example, parks) and blue spaces (for example, lakes) that can cool urban environments on hot days

Biotic

Ecosystem services that are produced by the living environment are referred to as biotic.

Abiotic

Services that are not produced by the living environment are referred to as abiotic. In some cases, these were produced by the living environment, but this is no longer the case, for example, oil and gas or some minerals.

Habitat generalist

Species that are able to exploit a variety of environments, or do not rely on a particular environment.

Habitat specialist

Species that are able to survive mostly or exclusively in one or a few habitats.

11 . Related links

Enclosed farmland natural capital accounts, UK: 2026
Bulletin | Released 8 July 2026
Natural capital accounts containing information on the extent, condition and ecosystem services for enclosed farmland in the UK.

Woodland natural capital accounts, UK: summary tables
Dataset | Released 26 February 2026
Detailed data breakdown of financial and societal value of woodland natural resources in the UK.

Marine and coastal margins natural capital accounts, UK: 2025
Bulletin | Released 8 August 2025
Natural capital accounts estimating the extent, condition, and annual and asset value of biotic (living) and abiotic (non-living) ecosystem services for marine and coastal margins habitats in the UK.

12 . Cite this page

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