State of Nature 2019

NBN Conference 2019

13th November

Aim of the UK State of Nature Report

- **To provide an authoritative, objective statement on the state of UK nature using the best available data and expertise….**

➔ a representative & unbiased assessment (taxonomic, spatial & temporal bias)

State of Nature Partnership

79

organisations


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NATURE
2019
state of nature PARTNERSHIP


STATE OF NATURE
A SUMMARY FOR SCOTLAND
STATE OF NATURE
2019
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#STATEOFNATURE
352 TERRESTRIAL AND FRESHWATER SPECIES ASSESSED IN SCOTLAND HAVE DECLINED BY 12% IN JUST 10 YEARS.
state of nature PARTNERSHIP
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Harry done two part two, I think
it would be more effective if

the Foreword come from someone new

Best wishes

David

#STATEOFNATURE

State of Nature 2019 **documents how human impacts are driving sweeping changes in wildlife in the UK. The loss of nature affects us all, but the greatest impacts will be upon the lives of young people and generations yet to come, if they have to live in a world impoverished of nature. In recognition of this, we asked some of the UK's most passionate and committed young conservationists to tell us what nature means to them.**

"Nature provides liberation from the hustle of modern society, allowing our attention to shift away from ourselves and focus on the glorious and the sublime. For me it is not a supplement, it is a necessity."

BELLA LACK, 15

"The revival of the Red Kite, Ospreys bouncing back, breeding Cattle Egrets – many species are bringing new life to the UK but the list of declining species is ever growing. We must unite now to save these species before they're but a distant memory."

DAN ROUSE, 23

"Nature is our life support system. As an autistic teenager, nature has provided a safe space to which I can crawl into, rejuvenate my spirits and keep me going."

DARA MCANULTY, 15

"I wholly believe that it is our duty to protect nature and the environment as a reciprocation to how nature takes care of us every single day. Nature allows us to eat, drink, breathe, live. The least we can do is protect it."

YETUNDE KEHINDE, 17

"Nature is important to me because it reminds me to keep going even when things are hard. The fresh air and petrichor give me space to breathe and let go and make me feel better. Nature always gives a solution, and adapts, always trying hard, and I think we all have something to learn from nature."

ESTHER BIRD, 13

"I have never seen a Hedgehog, although my parents used to see them all the time in the area. Many others my age have had the same experience. I'm worried that we're close to losing them from our countryside forever."

JAMES MILLER, 17

Photo: David J Slater (rspb-images.com)

"Thanks to the dedication of schoolchildren and volunteers in the City, wildflower meadows and roof gardens have been created, allowing pollinators, including many butterflies, to thrive in central London. This shows the potential we all have to protect nature, in every place, even in our concrete jungles."

KABIR KAUL,14

"Whenever I have the chance to experience the outdoors, the presence of nature brings a feeling of tranquillity. Seeing the variety of animals and plants that our forests, parks and meadows contain gives me the urge to protect the environment even more."

KHADIJAH HAQ, 14

"My favourite thing about nature is its unmistakable diversity. I am reminded of the woods by the captivating scents of wildflowers; majestic colours of birds soaring high, and simply the soothing symphony of birdsong."

PRINCESS-JOY EMEANUWA, 17

"I worry that people don't recognise how valuable their individual actions are in sparking change. Planting wildflowers, drilling a few holes in bricks, being a bit 'lazier' in the garden, can encourage so much wildlife to your doorstep – it couldn't be easier!"

SOPHIE PAVELLE, 24

"During my GCSE exams, Dartmoor was a refuge – wading through streams, finding bats in hidden caves and making camps under trees. Immersing ourselves in nature like this is the antidote to our dissociation from the earth that has driven the climate crisis."

SOPHIE SLEEMAN, 17

"It is everyone's responsibility to contribute to help the natural environment. Even the smallest of actions can make the biggest of difference, like rewilding your own garden to make it insect, bird and mammal friendly."

XANDER JOHNSTON, 13

What goes into making State of Nature?

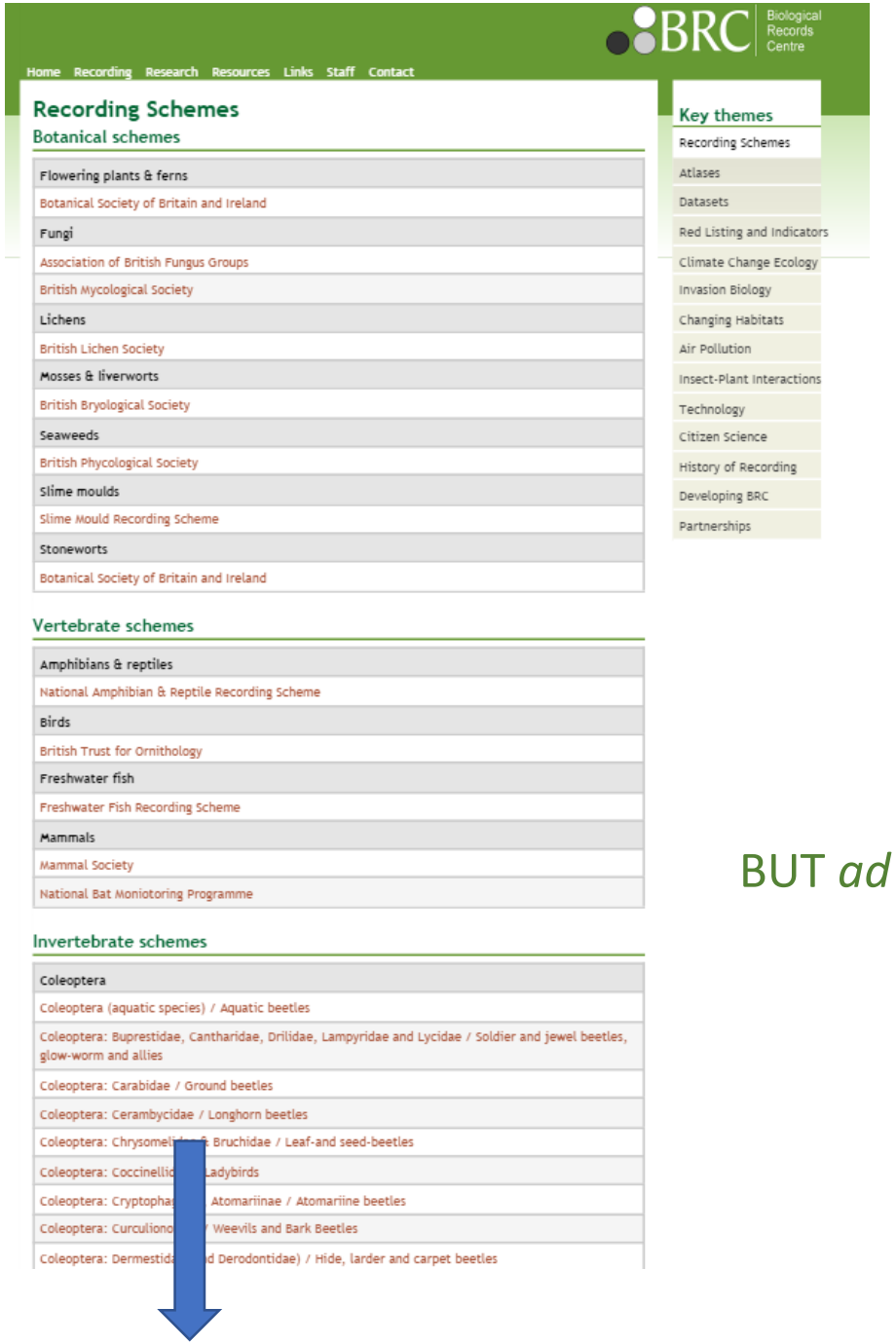
WeBS

BBS

ROTHAMSTED RESEARCH

UKBMS

Bat Conservation Trust
www.bats.org.uk



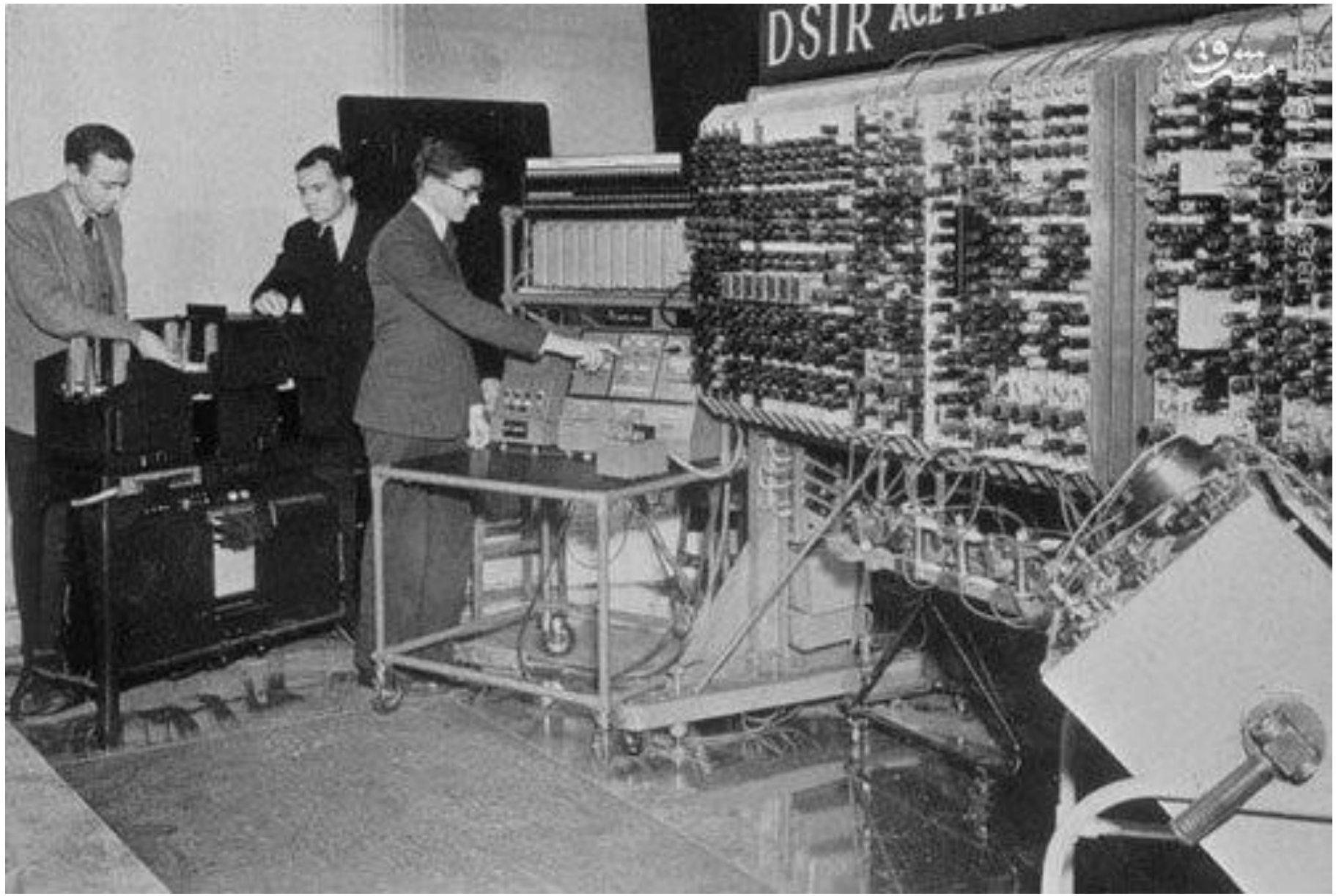
ICES CIEM

CONTINUOUS PLANKTON RECORDER SURVEY
Est. 1931

BUT *ad hoc* recording is biased

- in time
- in space
- detectability
- effort per visit

Can we derive annual estimates of status, for large numbers of species, using biological records?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Our statistics demonstrate that the abundance and distribution of the UK's species has, on average, declined since 1970 and many metrics suggest this decline has continued in the most recent decade. There has been no let-up in the net loss of nature in the UK.

Prior to 1970, the UK's wildlife had already been depleted by centuries of persecution, pollution, habitat loss and degradation.


Pasqueflower

Photo: Ben Andrew (rspb-images.com)

13% decline in average species' abundance.

Our indicator of average species' abundance of 696 terrestrial and freshwater species has fallen by 13% since 1970; the rate of decline was steeper in the last 10 years, although not statistically significantly so.

5% decline in average species' distribution.

Our indicator of average species' distribution, covering 6,654 terrestrial and freshwater species over a broad range of taxonomic groups, has fallen by 5% since 1970, and is 2% lower than in 2005.

41% have decreased in abundance.

More species have shown strong or moderate decreases in abundance (41%) than increases (26%) since 1970, and likewise more species have decreased in distribution (27%) than increased (21%) since 1970.

53% of species show strong changes.

Our wildlife is undergoing rapid change; the proportion of species defined as showing strong changes in abundance, either increasing or decreasing, rose from 33% over the long term to 53% over the short term.

15% of species are threatened.

Of 8,431 species that have been assessed using regional Red List criteria, 15% have been classified as threatened with extinction from Great Britain, and 2% are already extinct.

By 2020 most CBD targets won't be met.

An assessment based on the best available data indicates that, although progress has been made, the UK will not meet most of the CBD's 2020 Aichi targets.

The pressures

that have caused the net loss of biodiversity over recent decades continue to have a negative effect.

- Agricultural productivity, linked to the intensification of land management and the decline in farmland nature, is still increasing, although with government funding some farmers have adopted wildlife-friendly farming.
- Average UK temperatures have increased by nearly 1°C since the 1980s with widespread impacts on nature evident already.
- Legislation has driven marked reductions in emissions of some harmful pollutants, although negative impacts remain.
- Thousands of hectares of farmland, woodland and wetland are built on every year to meet the needs of our increasingly urbanised population, although woodland cover has increased, new wetland habitat has been created and heathlands and moors restored.


Photo: Ian Francis (rspb-images.com)

This report showcases a wide range of exciting conservation initiatives,

with partnerships delivering inspiring results to secure a brighter future for the UK's nature. Public support for conservation continues to grow, with non-governmental organisation (NGO) expenditure up by 24% since 2010/11 and a 46% increase in the time donated by volunteers since 2000. However, public sector expenditure on biodiversity, as a proportion of gross domestic product (GDP), has fallen by 42% since a peak in 2008/09, although the UK's expenditure on international biodiversity has grown.


Photo: Chris Gomersall (rspb-images.com)

The impacts of climate change and fishing

on species' abundance and distribution are evident throughout the UK's seas. At the base of the food web, plankton communities have changed in response to warming seas. While some fish stocks are showing signs of recovery, the impacts of decades of unsustainable fishing persist. The precise impact of other pressures on the marine environment, such as noise and plastic pollution, remain unclear.


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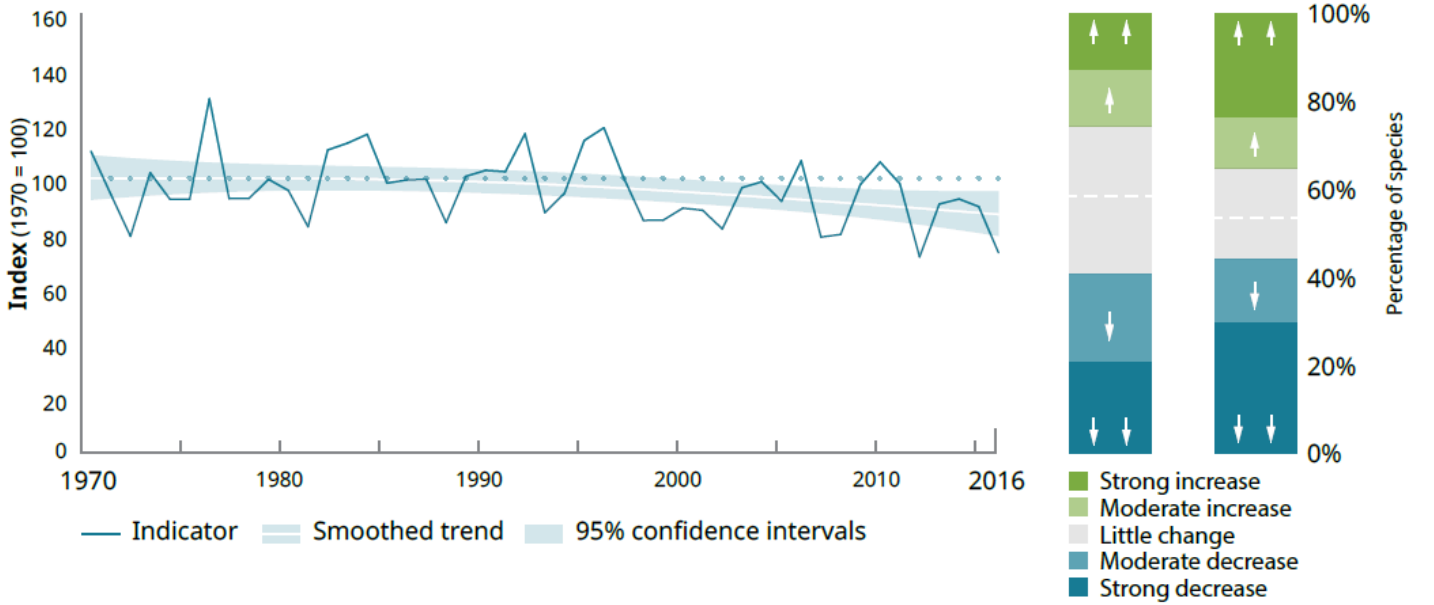

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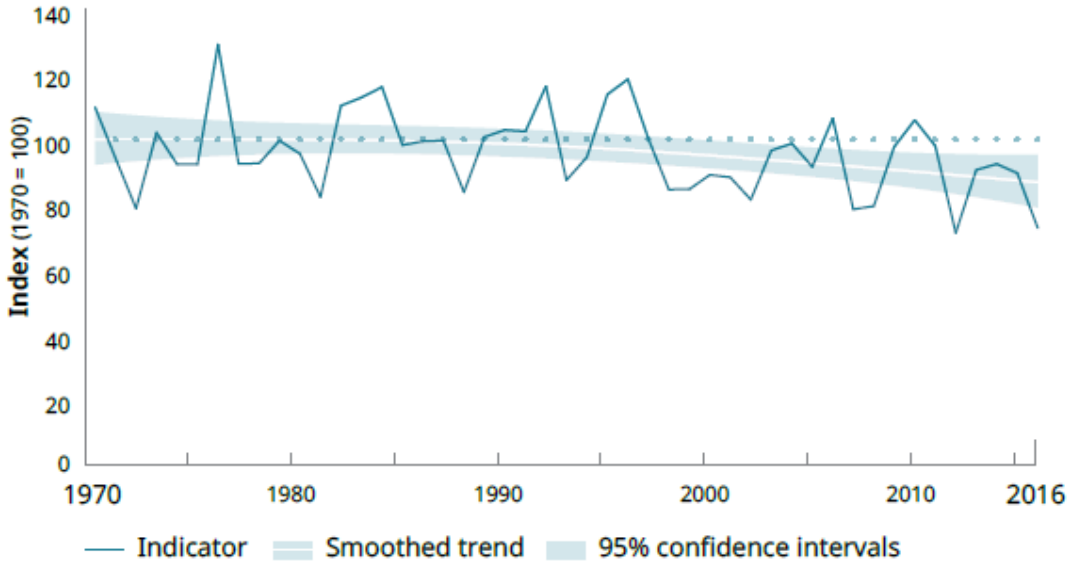
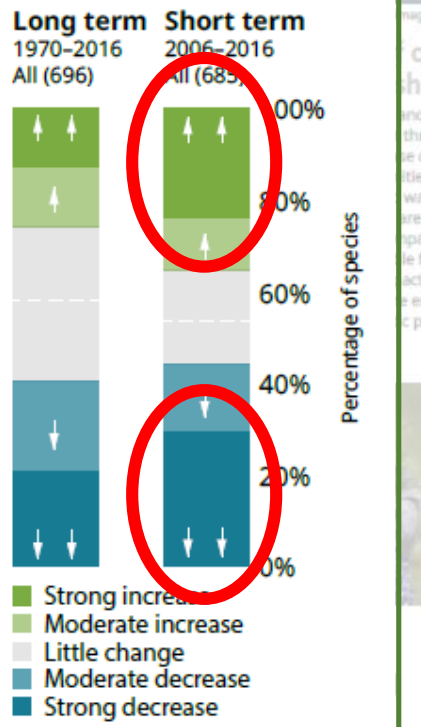
Abundance indicator (696 species)





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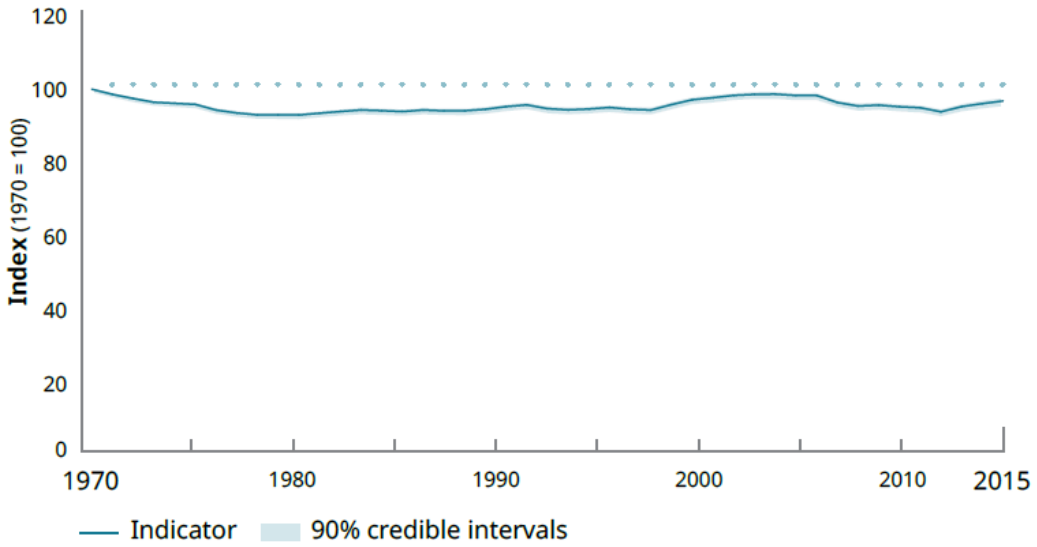
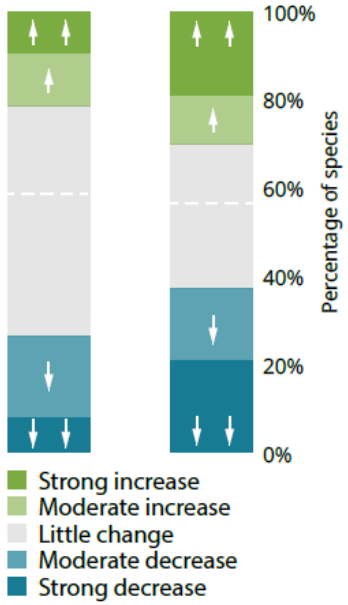
Occupancy indicator (6,654 species)





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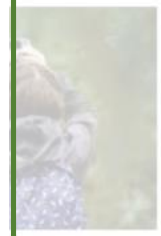

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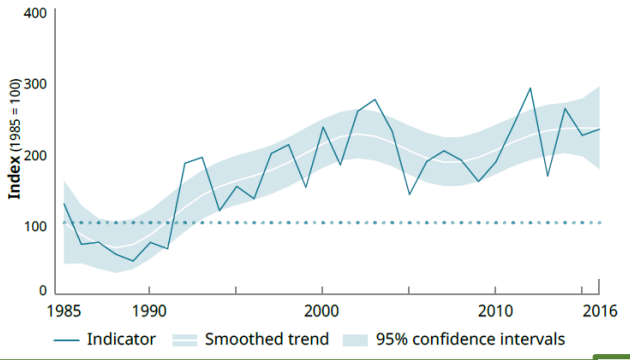
Change in average species' abundance – Celtic Seas demersal fish

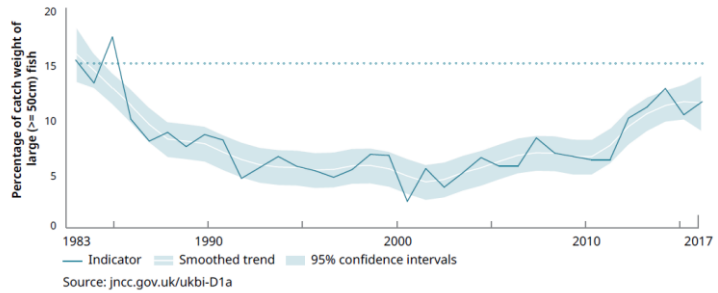
Abundance indicator (11 species)



in the most recent decade. There has been no let-up in the net loss of nature in the UK.

Prior to 1970, the UK's wildlife had already been depleted by centuries of persecution, pollution, habitat loss and degradation.

UK Biodiversity Indicator: Proportion of large fish (equal to or larger than 50cm), by weight, in the North Sea, 1983 to 2017



Source: jncc.gov.uk/ukbi-D1a

Photo: Ben Andrew (rspb-images.com)

13% decline in average species' abundance.

Our indicator of average species' abundance of 696 terrestrial and freshwater species has fallen by 13% since 1970; the rate of decline was steeper in the last 10 years, although not statistically significantly so.

5% decline in average species' distribution.

Our indicator of average species' distribution, covering 6,654 terrestrial and freshwater species over a broad range of taxonomic groups, has fallen by 5% since 1970, and is 2% lower than in 2005.

41% have decreased in abundance.

More species have shown strong or moderate decreases in abundance (41%) than increases (26%) since 1970, and likewise more species have decreased in distribution (27%) than increased (21%) since 1970.

53% of species show strong changes.

Our wildlife is undergoing rapid change; the proportion of species defined as showing strong changes in abundance, either increasing or decreasing, rose from 33% over the long term to 53% over the short term.

15% of species are threatened.

Of 8,431 species that have been assessed using regional Red List criteria, 15% have been classified as threatened with extinction from Great Britain, and 2% are already extinct.

By 2020 most CBD targets won't be met.

An assessment based on the best available data indicates that, although progress has been made, the UK will not meet most of the CBD's 2020 Aichi targets.

The pressures

that have caused the net loss of biodiversity over recent decades continue to have a negative effect.

- Agricultural productivity, linked to the intensification of land management and the decline in farmland nature, is still increasing, although with government funding some farmers have adopted wildlife-friendly farming.
- Average UK temperatures have increased by nearly 1°C since the 1980s with widespread impacts on nature evident already.
- Legislation has driven marked reductions in emissions of some harmful pollutants, although negative impacts remain.
- Thousands of hectares of farmland, woodland and wetland are built on every year to meet the needs of our increasingly urbanised population, although woodland cover has increased, new wetland habitat has been created and heathlands and moors restored.

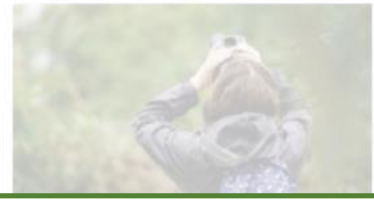
future for the UK's nature. Public support for conservation continues to grow, with non-governmental organisation (NGO) expenditure up 24% since 2010/11 and a 46% increa in the time donated by volunteers since 2000. However, public sector expenditure on biodiversity, as a proportion of gross domestic product (GDP), has fallen by 42% since a peak in 2008/09, although th UK's expenditure on international biodiversity has grown.

#STA

Photo: Chris Gomersall (rspb-images.com)

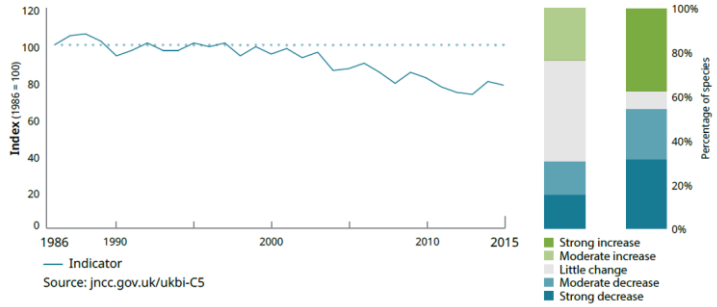
The impacts of climate change and fishing

on species' abundance and distribution are evident throughout the UK's seas. At the base of the food web, plankton communities have changed in response to warming seas. While some fish stocks are showing signs of recovery, the impacts of decades of unsustainable fishing persist. The precise impact of other pressures on the marine environment, such as noise and plastic pollution, remain unclear.



UK Biodiversity Indicator: Breeding seabirds in the UK

Abundance indicator (13 species)



Source: jncc.gov.uk/ukbi-C5

THE UK GOVERNMENT HAS ASSESSED THAT THE COUNTRY IS ON TRACK TO MEET FIVE OF THE 20 AICHI TARGETS BY 2020.

Extinction of threatened species: "By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained." The *State of Nature 2019* shows that 15% of the 8,418 species assessed are regarded as threatened with extinction in Great Britain, although it is not known how this percentage has changed over time. The abundance of species identified as conservation priorities, including many of the species at greatest risk of extinction, has fallen to 40% of its 1970 value, and continues to fall in the short term (by 22% between 2011 and 2016). The status of species more widely continues to fall in response to a wide range of pressures, with a measure of species' abundance down by 13% over the long term, and one of species' distribution down by 5%. While this report demonstrates how targeted conservation action can prevent extinction, and gives examples of wonderful and inspiring successes, it is clear that more needs to be done to address the needs of threatened species and thus meet this target.

THE HEADLINES

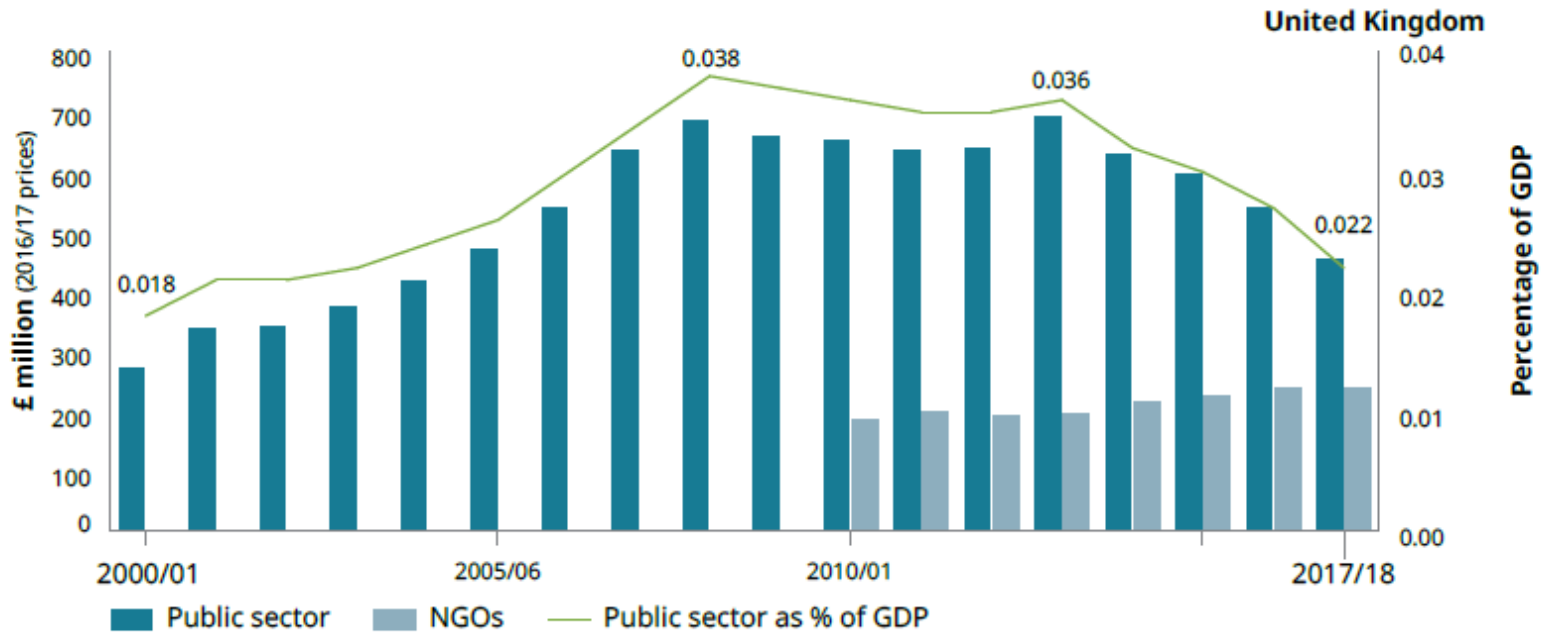
In this report we have collated the best available data on the UK's biodiversity, with a focus on the trends in species as the key evidence of how nature is faring. In addition to assessing the state of nature we have reviewed the pressures acting upon nature, and the conservation response being made to counter these pressures, in order to give a rounded view of the UK's nature in 2019.

The pressures

that have caused the net loss of biodiversity over recent decades continue to have a negative effect.

- Agricultural productivity, linked to the intensification of land management and the decline in farmland nature,
- Legislation has driven marked reductions in emissions of some harmful pollutants, although negative impacts remain.
- Thousands of hectares of farmland, woodland and wetland are built on every year to meet the

UK Biodiversity Indicator: Expenditure on biodiversity in the UK, 2000/01 to 2016/17



Source: jncc.gov.uk/ukbi-E2

13%

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expenditure on biodiversity, as a proportion of gross domestic product (GDP), has fallen by 42% since a peak in 2008/09, although the UK's expenditure on international biodiversity has grown.

natural heritage.

Thanks to this, tens of thousands of volunteers collect data on wildlife every year. Without their dedication this report would not be possible; we thank them all.

#STATEOFNATURE

HISTORICAL CHANGE IN BIODIVERSITY

State of Nature 2019 **focuses on recent changes in biodiversity, and the drivers of these changes, but we must remember that we have been shaping our landscape, and the wildlife within it, for millennia. It is widely accepted that the UK's biodiversity had been massively depleted by centuries of habitat loss, management changes, development and persecution before *State of Nature's* 1970 baseline. We are unable to measure this depletion accurately, but know many of the significant changes which occurred over the last two hundred years.**

THE GOOD NEWS

- In **1941**, Avocets return to the UK after a 100-year absence.
- Polecats begin a slow recovery in Wales from a low point in the **1930s**.
- The Large Blue butterfly is reintroduced to the West Country in **1985**.
- Salmon return to the Thames after a 125-year absence.
- Fisheries management enables the recovery of Herring stocks.
- Otters returned to every county in the UK by **2011**.
- By **2014**, the Lady's Slipper Orchid was flowering at 11 reintroduction sites.
- Corncrakes return to breed in Northern Ireland in **2016**.

ACTION TO HELP NATURE

- The first nature reserve was established in **1821** at Walton Hall, West Yorkshire.
- Wild Birds Protection Act 1876 introduced.
- The RSPB was formed in 1889, the National Trust in **1895** and the first of the Wildlife Trusts in **1912**.
- UK Government's Nature Conservancy established in **1949**.
- First National Park, the Peak District, designated in **1951**.
- Whaling by the UK ended in **1963**.
- Wildlife and Countryside Act **1981** introduced.
- The harmful pesticide DDT was banned in the UK in **1984**.
- Countryside Stewardship Scheme piloted in **1991**.
- The EU Water Framework Directive, addressing water pollution, comes into force in **2000**.
- The global 2020 Aichi targets are adopted in **2010**.
- In **2017**, UK carbon emissions drop to 43% below 1990 levels.
- Beinn Eighe in the Scottish Highlands becomes the UK's first Gene Conservation Unit protecting local Scots Pine lineages.

PRESSURES ON NATURE

- The first industrial revolution spanned **1780–1830**.
- 1,000km² of wetlands were drained annually between **1840** and **1880**.
- The UK's human population exceeded 30 million in **1871**.
- The introduction of steam trawlers caused a rapid increase in fishing during the **1880s**.
- The UK's first full-length motorway, the M1, opened in **1959**.
- 97% of wildflower meadows were lost between the **1930s** and **1984**.
- The UK joined the Common Agricultural Policy in **1973**.
- 10,000km² of land were drained in the **1970s**.
- The Central England temperature time series was 1°C warmer in latest decade compared to the pre-industrial period (**1850–1900**).
- The area of crops treated with pesticides increased by 53% between **1990** and **2010**.
- In **2019**, the UK's sixth national report to CBD indicates that the country is on track to meet five of the 20 Aichi targets by **2020**.

THE BAD NEWS

- The Great Auk was hunted to extinction in the UK in **1840**.
- Salmon disappear from the Thames in **1833**.
- Invertebrate extinctions hit a high in England, with 12 species lost between **1900 and 1910**.
- The loss of Mitten's Beardless Moss from Sussex in **1920** means the species goes extinct globally.
- Overfishing led North Sea Herring stocks to decline by over 99% between the **1960s** and **mid-70s**.
- Since the **1950s** wildflowers have been lost at a rate of up to nearly one species per year per county.
- Thirteen species of farmland bird were red-listed as Birds of Conservation Concern in **1996**, including Turtle Dove, Grey Partridge and Corn Bunting.
- The Freshwater Pearl Mussel became extinct from two Scottish rivers per year on average, between **1970** and **1998**.
- The indicator of habitat specialist butterflies down by 68% since **1976**.
- The Birds of Conservation Concern Red List increased from 36 to 67 species between **1996** and **2015**.

Photos: istock


THE GREATEST DRIVERS OF CHANGE IN THE UK ARE...
Climate change
Urbanisation
Pollution
Woodland management
Fisheries
Invasive established non-native species
Freshwater management
Agricultural management

CONTENTS

AGRICULTURAL MANAGEMENT

A wide range of changes in agricultural management in recent decades has led to greater food production but they have also had a dramatic impact on farmland biodiversity. For example, populations of farmland birds have more than halved on average since 1970, and similar declines have been seen in many other taxonomic groups. Targeted wildlife-friendly farming, supported by government-funded agri-environment schemes (AES), can halt and reverse these declines, but to date the only successes have been for rare and localised species. The area of land receiving effective agri-environment measures may have helped slow the decline in nature but has been insufficient to halt and reverse this trend.

PRESSURE

Agricultural productivity has increased by over 150% since 1973.

STATE

Farmland bird indicator has fallen by 54% since 1970.

RESPONSE

Area under agri-environment increased to around 3 million ha.

Photo: Andy Hay (rspb-images.com)

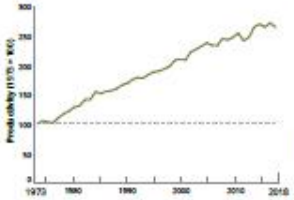
PRESSURES ON NATURE

Agriculture has been the dominant use of land in the UK for centuries, driven by the need to produce food for subsistence or profit since humans moved from hunter-gatherer societies to begin cultivating crops and raising animals. These practices have profoundly shaped historical and cultural perspectives on our landscapes and nature, and continue to do so today. Agricultural change has been identified as the most important driver of biodiversity change over the past 45 years[1], with most effects being negative. There are, however, also a range of species and habitats that largely depend on agricultural management.

Currently, 72% of the UK's land area is managed for agriculture, about one-third arable and two-thirds pastoral (grassland, moor and heath). Half of the arable land is used for cereal crops, while pastoral land is predominantly used to raise sheep (over 30 million) and cattle (over 10 million)[2].

Although historical changes have had massive impacts, it is only since the systematic recording of a suite of wildlife taxa began in the 1970s that we have been able to clearly link specific changes in management to changes in biodiversity. The changes in farmland management over the past 50 years that have had the greatest impact on the UK's nature include the increased use of pesticides and fertilisers; increased stocking rates, changes in crops and cropping patterns (e.g. grasslands managed for silage rather than hay production, with reseeding and drainage, crops sown in the autumn rather than the spring); farm specialisation (e.g. in either arable or livestock enterprises); greater mechanisation and increase in farm size; and loss of nature-friendly features such as field margins, hedgerows, wooded areas and farm ponds[3,4]. Over this period, agriculture has followed a consistent trend of increasing productivity (the ratio of inputs to outputs, a product of increased land and resource use efficiency), with associated consequences for wildlife. Of course, increased productivity does not of itself impact wildlife; it is some of the changes in management that have delivered increased productivity that have had a detrimental effect.

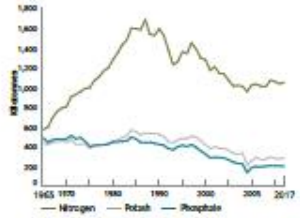
Agricultural productivity in the UK, a measure of intensification, 1973 to 2018[5]



An increasing awareness of the impact of modern farming methods on nature has led to changes in how public funds are used to support the agricultural sector. Since the 1990s a move away from direct production subsidies to area payments, coupled with requirements to meet basic environmental standards (cross-compliance) and the introduction of agri-environment schemes (AES), has aimed to mitigate some of the impacts of farming and help wildlife recover.

Although agricultural productivity continues to increase, the use of fertilisers, particularly nitrogen and phosphates, has decreased since peaking in the 1980s[6]. Numbers of sheep and cattle peaked in the 1970s and 1980s as a result of market trends and Common Agricultural Policy support payments, but have now fallen back. Spring-sown cereals, which can benefit farmland wildlife by providing an overwinter stubble, are also making a slight comeback, in part to combat herbicide-resistant weeds such as Black Grass.

Total quantities of nutrients used in the UK, 1965 to 2017[6]



Reported trends for pesticide use in the UK demonstrate some of the complexities involved in monitoring. Although the total weight of the active ingredient in pesticides has fallen markedly over the past 25 years, the number of hectares treated with pesticides, along with the frequency of treatments, have increased. In addition, there have been increases in the toxicity of pesticides and the variety of pesticides used on a single crop[7].

Trends in pesticide use in the UK, 1990 to 2016[6]

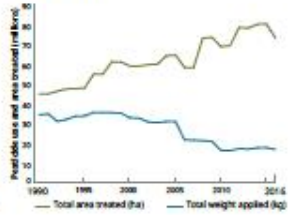


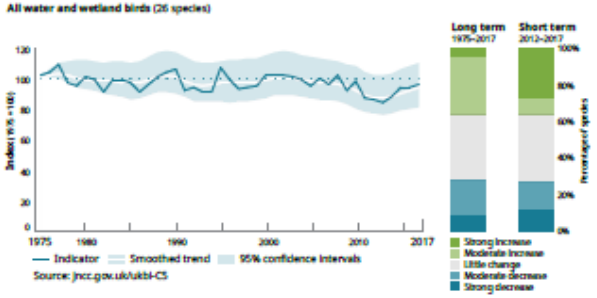
Photo: Colin Wilkinson (rspb-images.com)

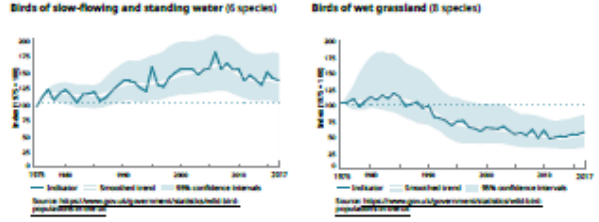
THE STATE OF NATURE

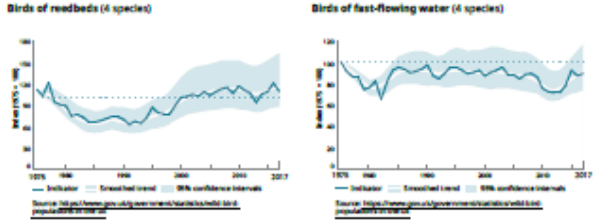
Changes in the populations of water and wetland birds can be closely linked to hydrological changes, although the impacts vary widely across species, and other factors interact and play their part. The breeding water and wetland bird indicator for the UK fell by 6% between 1975 and 2017, but over the short term has increased slightly, by 3%[11].

Within the indicator, species can be split into groups based on breeding habitat. Species associated with slow-flowing and standing water, and with reedbeds, have on average shown increasing trends, with a range of species benefiting from new habitat created through the restoration of gravel pits after extraction has finished and improvements in river management. Conversely, birds of fast-flowing (typically upland) rivers, and wet grasslands, have declined on average. Declines have been most notable in breeding waders of lowland wet grassland such as Lapwing and Snipe, due to habitat loss. Outside Scotland, a large proportion of these species' populations are now confined to sites managed as nature reserves.

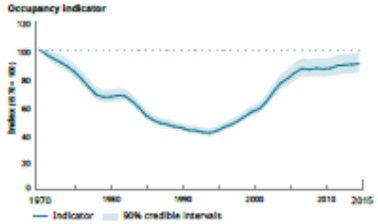
UK Biodiversity Indicator: Breeding water and wetland birds in the UK, 1975 to 2017 – Abundance indicators







Change in distribution of freshwater invertebrate species, 1970 to 2015[13]



Occupancy modelling has revealed interesting patterns in the distribution of several groups of aquatic macroinvertebrates. Freshwater invertebrates, Stoneflies (*Plecoptera*), Caddisflies (*Trichoptera*), aquatic bugs (*Hemiptera*), Dragonflies (*Odonata*), Mayflies (*Ephemeroptera*) and freshwater molluscs were recorded at a declining number of sites through the 1970s and 1980s, followed by strong increases in the years since. The drivers for this recovery are not fully understood, and improvements in water quality (such as a recovery from acidification) are likely to have played an important role, but hydrological management to restore rivers, changing river flow conditions and the presence of specific local-scale habitat features may have played a part for some species[14,14,15]. In addition, concerns remain about the status of aquatic macroinvertebrates more generally, including the widespread impacts of sediment and pesticide run-off, as well as the localised impacts of pollution events.

THE RESPONSE FOR NATURE

Given that good hydrological management can bring major benefits for humans through the provision of clean water for consumption and industrial use, and flood prevention, many recent policy actions have primary aims in these areas. However, as good hydrological practices also benefit nature, this is increasingly recognised as having all-round benefits by policymakers.

CASE STUDIES

Creating new wetlands on mineral extraction sites

Photo: Kevin Harwood (rspb-images.com)

The restoration of worked-out sand and gravel extractions to wetlands has become widespread in recent decades and provides an important opportunity for increasing the extent of wetland habitats. Partnerships between conservation organisations and operating companies help to ensure success. For example, as part of the Nature After Minerals project, the RSPB, Natural England, the Mineral Products Association and the British Aggregates Association work alongside quarry companies and planners to create new spaces for nature at worked-out quarries. Transforming previously industrial sites to places where nature can thrive is a powerful symbol of what can be achieved through effective partnerships. Highlights of this approach include:

- Over 8,000ha of new habitat (including 2,000ha of wetland) created and managed since 2010.
- With specialised ecological advice, a range of habitat features can be created to benefit rare species.
- 13% of all the UK's breeding Bitterns now nest in restored mineral sites.
- When training is delivered with and for industry partners, best practice can be shared.

Examples of habitat creation include the UK's largest created reedbed through the Hanson–RSPB Wetland Project in Cambridgeshire and 1,000ha of new habitats created over 10 years through the CEMEX–RSPB partnership.

Bringing back the Eurasian Beaver

Photo: Nick Upton (rspb-images.com)

Eurasian Beavers are native to the UK, and were once widespread across Scotland, England and Wales, but were hunted to extinction by the end of the 16th century.

Beavers are well known for their dam-building habits and can be considered as ecosystem engineers, with the ability to rapidly alter the hydrology of the landscape they occupy. By blocking flows, they slow down the passage of water and create pools with diverse structures while modifying the local habitat through natural coppicing, opening of glades and creating deadwood.

Recent efforts to restore Beavers to Scotland were led by the Scottish Wildlife Trust and Royal Zoological Society of Scotland with Scottish Natural Heritage and Forestry Commission Scotland. As a trial, four families of Beavers were released at Knapdale in Argyll in 2009. An intensive programme of monitoring and research assessed the impact of the trial, and of an additional unauthorised release on the Tay at around the same time, on both the natural and the human environment[16]. Conclusions from this work include:

- Beavers have an overall positive influence on biodiversity with a wide range of species benefiting from the habitats created, including fish, amphibians and a wide range of invertebrates.
- Ecosystem services are provided, such as increased groundwater storage, water flow stabilisation and flood prevention.
- A number of species may be adversely impacted, including Aspen woodland lichens, bryophytes, fungi communities and some invertebrates[16].

In England, the five-year River Otter Beaver Trial is being led by Devon Wildlife Trust with research by the University of Exeter and is due to report in 2020. In Wales, plans for a trial are being developed by the Welsh Beaver Project.

The future for Beavers

- There is an estimated 120,000ha of "potential Beaver woodland" – appropriate broad-leaved woodland in suitable proximity to freshwater – in Scotland.
- In 2014, 84% of respondents in a survey of mid-Argyll residents were in favour of Beavers continuing to live in the area[17].
- The monetary value to society of the Knapdale trial has been estimated at up to £6.7 million with the monetary cost of civil engineering impacts and timber loss being put at no more than £44,000[18].
- The Scottish Government concluded in 2016 that Beavers were in Scotland to stay and in May 2019 they were granted European Protected Species status.

With an increasing number of Beavers in the wild and in fenced trial sites in England and Wales, and provided that the right balances can be struck, it may be that this charismatic ecosystem engineer is making a long-awaited return to the UK.

RESTORING LANDSCAPES

The need to think big to turn around the fortunes of nature has been increasingly well recognised; such thinking that was crystallised in Professor Sir John Lawton's 2010 report, *Making space for nature*[1], which called for "more, bigger, better, joined" wildlife sites. Vitally, this extends conservation thinking beyond reserves, to the need to reduce fragmentation – whereby nature is stuck in isolated islands in a hostile sea of intensively managed countryside – by creating corridors between sites for wildlife to flow through, or stepping stones to help species jump across. In addition, Lawton called for "buffers" around wildlife sites, softening the intensive management that often runs up to reserve boundaries. Finally, Lawton's call for "better" needs to be addressed. The management of large areas of potentially wildlife-rich semi-natural habitat, such as in the UK's uplands, is unsympathetic to biodiversity.

Photo: David Wootton (rspb-images.com)

CASE STUDY

Great strides are being made to introduce such approaches, and demonstrate partnership working between government, NGOs, businesses, farmers and local communities. For example, in Northern Ireland, NGOs including the RSPB, Ulster Wildlife and Butterfly Conservation are working with local and national government to protect, restore, expand and link wet grassland habitats across 2,000km² of the Lough Erne Basin, home to threatened wader populations and rare plants such as the Fen Violet and Irish Lady's-tresses Orchid.

FOCUSING ON SPECIES

While conservation policies to address the pressures on nature, delivered across landscapes, will help, for some species this will not be sufficient. Many of the most celebrated conservation successes of recent years – the return of the Pine Marten to Wales, the restoration of the breeding range of Red Kites, the establishment of Lady's Slipper Orchid at 11 sites in Northern England – have been the consequence of targeted action, based on robust science and conservation best practice. Programmes such as Back from the Brink, in England, have brought numerous partners together to target action for priority species, including the Lesser Butterfly Orchid, Barberry Carpet Moth and Ladybird Spider.

A review of the 1,063 terrestrial and freshwater species listed as priorities on the UK Biodiversity Action Plan (BAP) – which has now been replaced by conservation policies at the devolved country level – found that only 114 of these have been the focus of coordinated and targeted action in at least part of their UK range as part of species recovery projects (SRPs). Most of these had received little or no conservation action aimed explicitly at recovering their populations[2]. However, there are imbalances in the targeting of such efforts. While conservation action targeted at one species can help others – for example, reedbed creation for Bitterns is likely to have benefited a wide range of taxa, including Water Voles and the Reed Leopard moth[3], and agri-environment options intended to boost rare farmland birds such as Stone-curlew have benefits for a range of taxa, including threatened arable plants[4] – our invertebrates and plants are clearly receiving less specific attention than mammals and birds. This contrasts with growing evidence that insects are showing rates of decline that may be greater than other taxonomic groups. Of those species that have been the subjects of SRPs, 61% are vertebrates, despite this group making up just 9.5% of the terrestrial and freshwater species identified as priorities. A further 26% of species with SRPs are invertebrates (mainly butterflies), despite this group representing 39% of priority species, and only 13% of plant and fungi species were identified as having had SRPs, despite this group making up 52% of all species listed as UK BAP priority species[2].

Steve Knell (rspb-images.com)

BROADER ENVIRONMENTAL POLICY

Our impact on the UK's land and seascapes is pervasive – the impact of climate change is felt everywhere, three-quarters of land is affected directly by farming policies, 33% of quota managed fish stocks are harvested unsustainably, urbanisation is widespread. So, clearly, we need policies that ensure that the need for space to live, work and play, food production, and use of other natural resources is met sustainably, in a way that allows nature to flourish. We have talked, for example, about how policies to encourage wildlife-friendly farming can be integrated with food production and the needs of nature (page 21), and how legislation to control acidifying pollution has enabled the recovery of some bryophytes and lichens (page 41). At sea, policies that prevent the overexploitation of vulnerable fish stocks, encourage fishing techniques that minimise bycatch and habitat damage, and protect the most important areas from fishing are vital to ensure healthy marine ecosystems (page 63).

Photo: Colin Wilkinson (rspb-images.com)

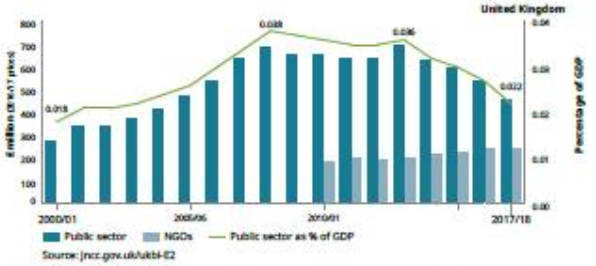
It is well recognised that policies to protect biodiversity and the environment bring huge benefits to human well-being, from clean air and water, healthy soils for food production, and the health and well-being impacts that result from connection with nature. Globally, these issues are recognised by the UN's Sustainable Development Goals[5] and by the CBD. We discuss the UK's progress towards the global 2020 targets (Aichi targets) on pages 90–91. As the parties to the CBD begin to discuss a post-2020 framework, we wait to see whether this will contain policies, and associated goals, that will encourage the transformative change which the recent Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) report stated was required to avoid global declines in nature from continuing.

RESOURCES FOR CONSERVATION

Ultimately, our ability to act to conserve the UK's nature is constrained by resources. In 2017/18, an estimated £456 million of UK public sector funding was spent on biodiversity in the UK. This funding has been declining, by 29% over the last five years, and by 34% since a high point in 2008/09. As a proportion of GDP this represents a fall of 42% from 0.038% to 0.022%. It should be noted, however, that the lower level of public sector funding for international biodiversity conservation (£205 million in 2017/18), including that in the UK's OTs, has risen by 111% over the last five years.

By contrast, spending on biodiversity in the UK by NGOs with a focus on biodiversity and/or nature conservation, while not matching government investment, has increased in recent years. It reached £239 million in 2017/18, having increased by 24% over the previous five years.

UK Biodiversity Indicator: Expenditure on biodiversity in the UK, 2000/01 to 2016/17



The increase in NGO spending on conservation provides evidence for increased public concern for the state of nature, and the value which they place on it, as does the rapid increase in volunteering to help nature conservation (page 10). Volunteers donate an immense resource to conservation in the UK; for example, we have estimated that around 7,500,000 volunteer hours go into collecting the biodiversity monitoring data upon which the *State of Nature* reports rely, every year. So, although financial investment is crucial, as are government policy and legislation, we must remember that the most successful conservation action arises from partnerships, across governments, charities, business, landowners and individuals working together.

CONTENTS

MARINE KEY FINDINGS

From seabirds and marine mammals at the top of the marine food web to plankton at the bottom, there have been large spatial and temporal changes in species' abundance and distribution in UK seas in recent decades[1].

Monitoring the marine environment is a more logistically challenging task than monitoring terrestrial habitats. Species data are collected across large areas, but geographic coverage varies and long time series are only available for a more limited set of taxa. Monitoring is carried out for seabirds at breeding colonies around the UK and for marine mammals and fish stocks in the Greater North Sea and Celtic Seas.

Other aspects of marine nature are monitored in relation to specific drivers of change in the marine environment. Pressures interact with each other and, in some cases, impacts are difficult to disentangle, often having synergistic and cumulative effects. For this reason, following our key metrics of the state of marine nature, we present metrics for taxonomic groups associated with specific drivers, namely climate change and fisheries, to give an overall picture of the state of marine nature.

Photo: Paul Sawer (rspb-images.com)

The UK Marine Strategy[1] provides a framework for protecting the UK marine environment while allowing sustainable use of marine resources. The update in 2019 provides a status assessment of marine biodiversity and drivers of change, closely related to broader geographic assessments across the North East Atlantic[2,3]. We draw on these assessments in the *State of Nature 2019* marine section.

MARINE FISH – CELTIC SEAS AND GREATER NORTH SEA

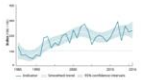
The abundance of marine fish and the composition of marine communities have been influenced by commercial fishing and climate change. Over the long-term period for which data are available (1980s to 2017), increases are evident as a result of warming sea temperatures which have enabled a large proportion of smaller-bodied pelagic fish species (e.g. Sardine and Sprat) to increase in abundance[4]. Through the 1980s and 90s fishing pressure led to declines in a number of larger-bodied species such as Cod[5] (page 59). Over the last 10 years, however, improved fisheries management has allowed some commercially fished species to increase from very low baselines.

The abundance indicators below use data from two trawl surveys[6,7] for a small proportion of the hundreds of demersal fish species that live on or near the sea floor (e.g. Cod, Haddock, Saithe). Very little is known about the vast majority of unmonitored and unregulated fish populations. The Celtic Seas (based on 11 species) and the Greater North Sea (based on nine species) indicators both show increases in average abundance as follows:

Celtic Seas

- Demersal species indicator shows a statistically significant increase of 133% over the long term (1985–2016) and a non-significant increase of 22% over the last 10 years.
- Over the long term 27% of species showed strong or moderate decreases and 64% showed strong or moderate increases; 9% showed little change.

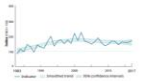
Change in average species' abundance – Celtic Seas demersal fish



Greater North Sea

- Demersal species indicator shows a statistically significant increase of 58% over the long term (1983–2017) and non-significant trend of -5% over the last 10 years.
- Over the long term 11% of species showed strong or moderate decreases and 78% showed strong or moderate increases; 11% showed little change.

Change in average species' abundance – Greater North Sea demersal fish



Data for pelagic fish species that live in the water column (e.g. Herring, Blue Whiting and Mackerel) indicate increases in average abundance in both the Celtic and the Greater North Seas over the same period. Groundfish surveys are less reliable for schooling pelagic species and therefore the direction of trend is more appropriate to report than the average magnitude of change.

Photo: Hans-Petter Fjeld

Cod

FISHERIES

Fish populations are complex and precious resources: they are of immense value to the fishing industry and provide food and employment for many people, but they are also an integral part of the marine food web and are vital for the survival of many other species, including seabirds, seals and cetaceans.

As well as directly affecting fish populations, fishing activities have wider impacts on marine species and habitats, including physical damage to the seabed caused by bottom contacting fishing gear and bycatch of seabirds and marine mammals. Bycatch also includes non-target fish species, which in turn introduces the issue of discarding unwanted catch at sea.

In recognition of this, restrictions on fishing practices, effort and equipment use are set, ideally based on scientific evidence, to reduce the environmental damage caused by fishing. Good monitoring information must be available to ensure that decision-making is underpinned by a sound evidence base and takes due account of the trends and status of the marine ecosystem as a whole. Ecosystem-based fisheries management is therefore fundamental to securing the urgent and necessary recovery of marine nature.

PRESSURE
Fishing activity – 33% of quota managed fish stocks are harvested unsustainably.

STATE
Demersal fish communities are recovering from overexploitation in the past, but Good Environmental Status (GES) has not yet been achieved in either the Greater North Sea or the Celtic Seas.

RESPONSE
The UK has a commitment to meet GES for fish and other marine wildlife and habitats by 2020.

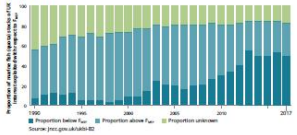
Photo: Chris Gomersall (rspb-images.com)

Marine fish and shellfish are harvested around the UK, representing the most widespread direct human pressure in UK waters[1]. Fish stocks of commercial interest span international boundaries; currently nine nations operate fisheries in the Greater North Sea[2] and 14 in the Celtic Seas[3]. When fish communities are heavily fished, the larger, more profitable fish are removed and the size-mix of the fish stocks is changed. Smaller, less commercially valuable, less reproductive individuals become more dominant, affecting the structure and stability of the ecosystem[4]. Our abundance indicators for marine fish species, both pelagic and demersal, show signs of recovery from a history of overexploitation.

SUSTAINABLE FISHERIES

The UK also has a legal commitment to fish sustainably by 2020 and the assessment of this relies on a measure of the maximum average long-term catch that can be taken from a population without reducing the ability of that population to reproduce itself, termed the Maximum Sustainable Yield (MSY). The official UK Government indicator shows that the percentage of fish stocks fished at or below levels considered to be capable of producing MSY has increased from 7% in 1990 to 49% in 2017, down from a maximum of 54% in 2013, and 33% of quota managed fish stocks are still harvested unsustainably. The UK administration's latest assessment of progress towards Good Environmental Status (GES) under the Marine Strategy Regulations[5] confirmed GES will not be met by 2020 for fish, commercial fish and shellfish, and benthic habitats.

UK Biodiversity Indicator: Proportion of marine fish (quota) stocks of UK interest harvested sustainably

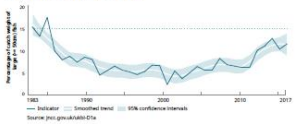


SIZE COMPOSITION OF FISH COMMUNITIES

Indicators of the size composition of fish communities reflect long-term impacts of fishing pressure. One such indicator, the Typical Length Indicator[6], reveals deterioration of the size structure of the fish communities in the North Sea and Celtic Seas between the 1980s and 2000s, such that these communities are now dominated by small-bodied fish. Since 2010 this indicator varies spatially but demersal fish and elasmobranch (shark and ray) communities have shown signs of recovery and the pelagic fish community shows fluctuating trends. The indicator remains low compared to the observed size structure in the early 1980s, and is at record low levels for pelagic and demersal fish in the south-eastern North Sea.

Further evidence for recovery, specifically in the North Sea, is shown by the Large Fish Index. The average percentage of large fish in a catch declined through the 1980s and 90s, to a low of 2% in 2001, but increased subsequently to 12% in 2017. Increases in the indicator could be driven by an increase in a few large commercial fish species[7] and in future is likely to be affected by climate-related changes in species' distributions[8].

UK Biodiversity Indicator: Proportion of large fish (equal to or larger than 50cm), by weight, in the North Sea, 1983 to 2017



CONTENTS

Marine

MARINE

Photo: Paul Sawer (rspb-images.com)

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The UK Marine Strategy[1] provides a framework for protecting the UK marine environment while allowing sustainable use of marine resources. The update in 2019 provides a status assessment of marine biodiversity and drivers of change, closely related to broader geographic assessments across the North East Atlantic[2,3].

The abundance indicators below use data from two trawl surveys[4,5] for a small proportion of the hundreds of demersal fish species that live on or near the sea floor (e.g. Cod, Haddock, Saithe). Very little is known about the vast majority of unmonitored and unregulated fish populations. The Celtic Seas (based on 11 species) and the Greater North Sea (based on nine species) indicators both show increases in average

Greater North Sea

- Demersal species indicator shows a statistically significant increase of 58% over the long term (1983–2017) and non-significant trend of -5% over the last 10 years.
- Over the long term 11% of species showed strong or moderate decreases and 78% showed strong or moderate increases; 11% showed little change.

Marine

FISHERIES

State of Nature Report 2019 59

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UK countries

ENGLAND

England's landscapes have been modified by human activity for millennia. Ever since the clearance of the "wildwood", its associated habitats and eradication of megafauna, biodiversity has undergone major changes. Few, if any, English habitats can be described as truly "wild"; however, human activity has modified and created the semi-natural habitats on which much of the current fauna and flora depend.

Major changes to the landscape have happened through history; for example, the drainage of Fenland started in the 17th century. Through the 20th century the intensification of agriculture has led to loss and fragmentation of semi-natural habitats. Despite this, England still contains a range of internationally important habitats, such as its lowland heathland, ancient woodland and chalk grasslands in the south, the blanket bogs along the Pennines, the coastal estuaries and saltmarshes that provide vital foraging habitat for wintering waterbirds, and the sea cliffs and offshore islands that support internationally important numbers of breeding seabirds.

KEY FINDINGS

1% decline in average species' abundance.
Our indicator of average species' abundance in England of 241 terrestrial and freshwater species (mainly birds) shows little change since 1970; however, butterflies show significant declines in abundance, while the indicators for birds and mammals show significant increases.

5% decline in average species' distribution.
Our indicator of average species' distribution in England, covering 5,942 terrestrial and freshwater species over a broad range of taxonomic groups, has fallen by 5% since 1970, and is 1% lower than in 2005.

35% of species have decreased in abundance.
More species have shown strong or moderate decreases in abundance (35%) than increases (31%) since 1970; likewise more species have decreased in distribution (31%) than increased (24%) since 1970.

46% of species show strong changes.
England's wildlife is undergoing rapid change; the proportion of species defined as showing strong changes in abundance, either increasing or decreasing, rose from 38% over the long term to 46% over the short term.

13% of species are threatened.
Of 7,615 species in England that have been assessed using IUCN Regional Red List criteria, 13% have been classified as threatened with extinction from Great Britain.

Photo: Andrew Mason (rspb-images.com)

UK countries

SCOTLAND

Scotland holds some of the most diverse landscapes in the UK. From the remote montane habitats of the UK's highest peaks and the extensive expanses of blanket bog and upland heath to the West Atlantic oakwoods, Caledonian pine forests, lochs, coasts and seas, Scotland supports a wide variety of wildlife. The landscapes hold species found nowhere else in the UK, including the Wild Cat, Capercaillie and the endemic Scottish Primrose, Northern February Red Stonefly and Scottish Crossbill[1].

The marine environment is a critical component of Scotland's natural history. The area within 12 nautical miles of the coast is greater than its total land area[1]. The deep seas around Scotland host the UK's only underwater mountains, known as seamounts. Scotland is also recognised as being of international importance for its breeding seabird colonies[2] and marine mammals[1].

KEY FINDINGS

24% decline in the average species' abundance.
Our indicator of average species' abundance in Scotland of 352 terrestrial and freshwater species has fallen by 24% since 1994. Moths show significant declines in abundance, while the indicators for birds and butterflies have remained broadly stable over time.

14% decline in average species' distribution.
Our indicator of average species' distribution in Scotland, covering 2,970 terrestrial and freshwater species over a broad range of taxonomic groups, has fallen by 14% since 1970, and is 2% lower than in 2005.

49% of species have decreased in abundance.
More species have shown strong or moderate decreases in abundance (49%) than increases (28%) since 1994, likewise more species have decreased in distribution (33%) than increased (20%) since 1970.

62% of species show strong changes.
Scotland's wildlife is undergoing rapid change; the proportion of species defined as showing strong changes in abundance, either increasing or decreasing, rose from 45% over the long term to 62% over the short term.

11% of species are threatened.
Of 6,413 species in Scotland that have been assessed using IUCN Regional Red List criteria, 11% have been classified as threatened with extinction from Great Britain.

Photo: Mark Hamblin (rspb-images.com)

UK countries

WALES

From the mountains of Snowdonia and the Brecon Beacons, through enclosed farmland dominated by livestock production, and down the numerous wooded valleys to the estuaries and sea, Wales holds a diverse range of habitats and wildlife. The Welsh Sessile Oak woodlands, regarded as part of the "temperate rainforests" of Europe, hold rich communities of bryophytes, lichens and fungi, while the mountains host rare invertebrates, including the Snowdon Leaf Beetle, and arctic-alpine plants such as Snowdon Lily[1].

The Welsh coastline stretches for over 2,000km. The islands off Pembrokeshire, Anglesey and the Llŷn Peninsula hold seabird colonies of global significance, including the world's largest Manx Shearwater breeding colony and the UK's fourth largest gannetry[2]. Cardigan Bay supports one of the larger semi-resident populations of Bottlenose Dolphin found in the UK.

KEY FINDINGS

52% decline in the average species' abundance of butterflies.
Our indicator of average species' abundance in Wales of 33 butterfly species has fallen by 52% since 1976; however, widespread breeding birds, wintering waterbirds and mammals (just seven species) show significant increases.

10% decline in average species' distribution.
Our indicator of average species' distribution in Wales, covering 2,977 terrestrial and freshwater species over a broad range of taxonomic groups, has fallen by 10% since 1970, and is 6% lower than in 2005.

30% of species have decreased in distribution.
More species have shown strong or moderate decreases in distribution (30%) in Wales than have increased (23%) since 1970.

46% of species show strong changes.
Wales' wildlife is undergoing rapid change; the proportion of species defined as showing strong changes in distribution, either increasing or decreasing, rose from 24% over the long term to 46% over the short term.

8% of species are threatened.
Of 6,500 species in Wales that have been assessed using IUCN Regional Red List criteria, 8% have been classified as threatened with extinction from Great Britain.

Photo: Drew Buckley (rspb-images.com)

UK countries

NORTHERN IRELAND

Northern Ireland's landscape is dominated by agricultural land, which makes up around 75% of the total area[1]. This farmed environment is criss-crossed with a range of special habitats resulting from the wet and mild climate. There are internationally significant areas of blanket bog and large inland and coastal water bodies, including Lough Neagh, the largest freshwater lake in the British Isles, which supports around 100,000 wintering waterbirds, and myriad lakes, fens and raised bogs. Northern Ireland holds species found nowhere else in the UK, including the Irish Hare, Irish Damselfly, Irish Whitebeam, Cryptic Wood White and Pollan. With 650km of coastline, the sea loughs, estuaries and marine environment are a significant component of Northern Ireland's biodiversity.

KEY FINDINGS

66% increase in average species' abundance of breeding birds.
Our indicator of average species' abundance in Northern Ireland of 41 breeding bird species has increased by 66% since 1994.

38% decline in average species' abundance of wintering waterbirds.
Our indicator of average species' abundance in Northern Ireland of 36 wintering waterbird species has fallen by 38% since 1988.

43% decline in average species' abundance of butterflies.
Our indicator of average species' abundance in Northern Ireland of nine butterfly species has fallen by 43% since 2006.

11% of species are threatened.
Of 2,450 species in Northern Ireland that have been assessed using IUCN Regional Red List criteria, 11% have been classified as threatened with extinction from Ireland as a whole.

Photo: Andy Hay (rspb-images.com)

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Marine

MARINE KEY FINDINGS

From seabirds and marine food web to been large spatia abundance and distr

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UK Overseas Territories and Crown Dependencies

THE UK OVERSEAS TERRITORIES AND CROWN DEPENDENCIES

The United Kingdom's responsibilities go far beyond the immediate shores of its constituent countries. The three Crown Dependencies (CDs) lie close to home, while 14 Overseas Territories (OTs) are scattered around the globe. Together they support populations of species of global significance, some found nowhere else on earth.

KEY FINDINGS

Over 32,000 species have been recorded across the OTs, but the actual number of species present is estimated to exceed 100,000 species.

At least 1,549 species are endemic to the OTs. 30% of these are found on St Helena alone.

45 species have become globally Extinct across the OTs and CDs. Most are historic, but three species have formally been assessed as globally Extinct in the 21st century. A further 15 species are classified as Possibly Extinct.

10% **of species are threatened with global extinction.** Of the 5,898 OT and CD species that have been assessed for the global IUCN Red List, 10% are classed as threatened and therefore at risk of global extinction.

40% of sharks, rays and skates, 36% of reptiles and amphibians, 11% of mammals, 8% of birds and 2% of bony fish found across the OTs and CDs are classified as threatened and therefore at risk of global extinction.

Photo: Alastair Wilson (rspb-images.com)

Wandering Albatross

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UNIQUE, GLOBALLY IMPORTANT WILDLIFE

The OTs and CDs hold wildlife populations of global importance. From the wild sub-Antarctic islands of the South Atlantic, to the rainforests of the Caribbean and the tropical islands of the remote Pacific, they hold many unique species and wildlife concentrations found nowhere else in the world.

So far 32,216 native species have been recorded across the OTs; however, information is patchy, and the actual number is estimated to exceed 100,000 species. Many of the OTs are isolated oceanic islands, and as a result they typically hold high numbers of endemic species. At least 1,549 have been documented to date, with 30% found on St Helena alone[1]. This compares to 348 known endemic species in Great Britain[2]. The OTs in the South Atlantic and Antarctic are of global importance for their seabird colonies and contain one third of the world's albatrosses and a quarter of its penguins[1].

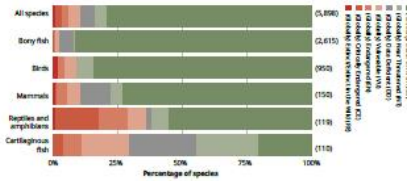
The CDs support a range of wildlife not found in the UK countries. Due to their more southerly location, the Channel Islands have a higher diversity of some wildlife groups, particularly reptiles and amphibians. As islands, the marine environment is an important element of all the CDs.

There are numerous examples of long-term biological studies across the OTs and CDs; however, there is currently insufficient information available to create multispecies indicators, as shown for the UK and some of its component countries.

GLOBALLY THREATENED SPECIES IN THE OTs AND CDs

Here we show the percentage of species found across the OTs and CDs that have been allocated to each of the IUCN Red List categories. All birds and most of the mammals, amphibians, reptiles and bony/cartilaginous fish have now been globally assessed for the IUCN's Red List. More assessments are needed to better understand the true status of other wildlife groups.

Percentage of species threatened = (CR + EN + VU)/(total number assessed – DD – RE). The number of species assessed is shown in brackets.



The IUCN's Red List of Threatened Species represents the world's most comprehensive information source on the global conservation status of species[3]. This documents the global extinction of 45 species across the OTs. Most of these are historic (since 1500 AD) but losses have continued.

Three species were formally assessed as globally Extinct in the 20th century, and three have been added so far this century. A further 15 species are currently classified as Critically Endangered (Possibly Extinct)[3].

Five thousand eight hundred and ninety-eight OT and CD species have now been assessed against the IUCN global Red List criteria. Of these, 560 (10%) of extant species, for which sufficient data are available, are classified as threatened (Critically Endangered, Endangered or Vulnerable), and therefore at risk of global extinction. Of the different taxonomic groups, 40% of cartilaginous fish – sharks, rays and skates – 36% of reptiles and amphibians, 11% of mammals, 8% of birds and 2% of bony fish are assessed as being threatened with global extinction.

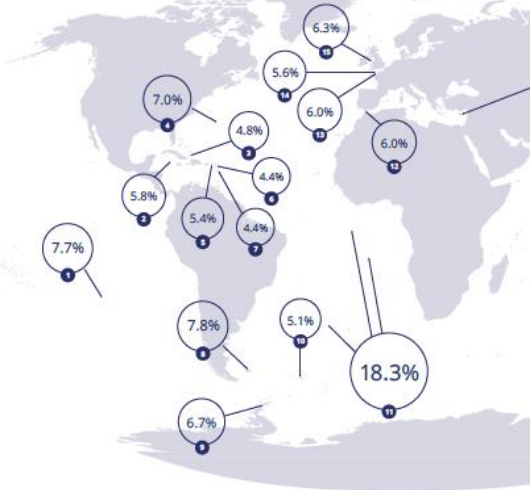
Photo: Alastair Wilson (rspb-images.com)

Bird Island, South Georgia

82 Key findings Drivers Conservation Marine UK countries UK OTs and CDs Essays Appendix

These pages show the global status of wildlife found across the UK OTs and CDs and a selection of pressures and conservation responses.

Similar proportions of globally threatened species occur across many of the OTs (<10%); however, nearly one in five species on St Helena, Ascension and Tristan da Cunha are formally assessed as being globally threatened with extinction.



The size of the circles denotes the proportion of extant species assessed as globally threatened with extinction on the IUCN Red List (see Methods, page 96).

Photo: Ben Dilley

Photo: Ben Dilley

Photo: Roger Tidman (rspb-images.com)

1 The UK and its OTs are together responsible for the fifth largest area of ocean in the world. The Pitcairn Islands Exclusive Economic Zone covers an area of 834,000km² and was declared a no-take MPA in 2016 as part of the Blue Belt programme (see page 84).

10 South Georgia, one of the world's last great wildernesses, was officially declared rodent-free in 2018, following the largest global eradication of its type. Introduced rats were having a devastating effect on seabirds and other wildlife.

11 Gough Island, within Tristan da Cunha, is one of the most important global seabird colonies; however, introduced mice are having a devastating impact on native wildlife. Recent estimates put the total number of seabird eggs/chicks lost annually to mouse predation at 1,739,000, including the Critically Endangered Tristan Albatross[5]. Gough has been rated as the island with the third greatest need of eradication action globally[6], and an ambitious project is now in development (see goughisland.com).

13 The Isle of Man is a hotspot for Basking Shark activity around the British Isles. Here researchers are fitting this globally Vulnerable species with satellite tags to better understand their movements and the pressures they face[4].

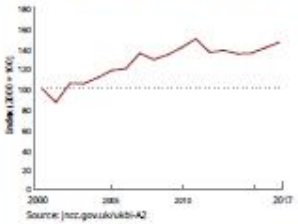
MONITORING THE STATE OF NATURE: WHO, WHAT AND WHY?

This *State of Nature 2019* report, and those published in 2013 and 2016, attempt to assess the state of the UK's nature based on a synthesis of the best available biodiversity data. This would not be possible without the huge effort put into the recording and monitoring of wildlife, most of it done by volunteers.

WHO HELPS MONITOR THE UK'S WILDLIFE?

While professional scientists and conservationists collect much valuable data on biodiversity in the UK themselves, this is outweighed by the huge contribution of volunteers who submit records and take part in structured surveys on a vast range of wildlife. It has been estimated that 18,700 volunteers are involved in structured monitoring schemes that cover bats, birds, butterflies and plants alone, and the financial value of their time contribution has been estimated at £20.5 million per annum[1]. In addition, as many as 70,000 volunteers submit records to national recording schemes and societies (NRSS)[2], or to local environmental records centres (LERCs), for a great range of taxonomic groups. While we do not have precise data on trends in the extent of this volunteer effort, we know that the contributions of time by volunteers (including but not limited to monitoring) to conservation organisations are estimated to have increased by 46% since 2000.

UK Biodiversity Indicator: Index of volunteer time spent in selected UK conservation organisations, 2000 to 2017



Source: jncc.gov.uk/ukbi-A2

The efforts of volunteers reflect the long-standing interest in natural history in the UK, which can be traced back to the expertise of naturalists such as Gilbert White in the late 18th century and John Ray a century before him. Many highly respected experts on the identification and ecology of specific taxonomic groups are volunteers with decades of experience and expertise, without whom recording schemes would not exist.

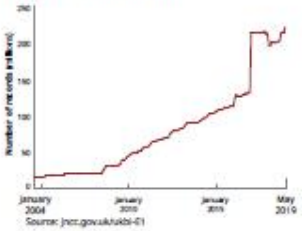
WHAT DO THEY DO?

Broadly speaking, biological data and the schemes that govern its collection can be divided into two categories. Firstly, there are structured surveys that are conducted at predefined sites using a set methodology – such as in the Wider Countryside Butterfly Survey (WCBS)[3]. Data from surveys such as the WCBS are submitted to survey coordinators, increasingly using online forms. Data are analysed using well-established statistical approaches to produce annual trends in abundance, with corrections made to account for biases such as when survey coverage is greater in some regions than others. The robust design and quality assurance procedures of such schemes mean they produce high-quality assessments, and datasets that can be used for numerous research purposes.

The other category is "unstructured" biological records – observations of species at a given time and place that were not collected as part of a structured survey. This means that the methods used and the data collected may vary, and there may be uncontrolled biases associated with the data, for example because observers choose where to go, and so may favour wildlife-rich sites, and are more likely to submit records of rare and special species than more commonplace ones. However, such ad-hoc records cover a huge range of species for which there are insufficient resources, or expert recorders, to run a structured scheme. There are over 90 national recording schemes covering a wide range of taxonomic groups[4] as diverse as slime moulds, stoneworts and leaf-mining moths.

The Biological Records Centre (BRC) curates the datasets compiled by many NRSS, which can be used to map the ranges of species and identify important sites and regions. While structured monitoring schemes remain the "gold-standard", recent statistical developments that account for recording biases[5,6] mean we are now able to use these data to detect trends in the occurrence of species over several decades. These trends play a pivotal role in the *State of Nature* reports, allowing us to report changes in a broad spectrum of the country's wildlife.

UK Biodiversity Indicator: Records added to the NBN, 2004 to 2019



Source: jncc.gov.uk/ukbi-D1

Data from many sources, including the BRC, are made available through the National Biodiversity Network's (NBN) database, the NBN Atlas. The NBN Atlas launched in 2017 and, at the time of writing, holds a remarkable 223,027,119 species' occurrence records, covering 45,448 species in 824 datasets, accessed through the NBN Atlas[7] – and this figure continues to grow rapidly, with jumps caused by the input of new datasets (see above). However, this is still incomplete, with not all data flowing smoothly from surveys, recording schemes, consultancies, scientists and LERCs to the NBN. Furthermore, an unknown but undoubtedly huge volume of data remains in observers' notebooks, photo libraries, social media feeds or simply as fading memories.

Photo: Sue Kennedy (rspb-images.com)

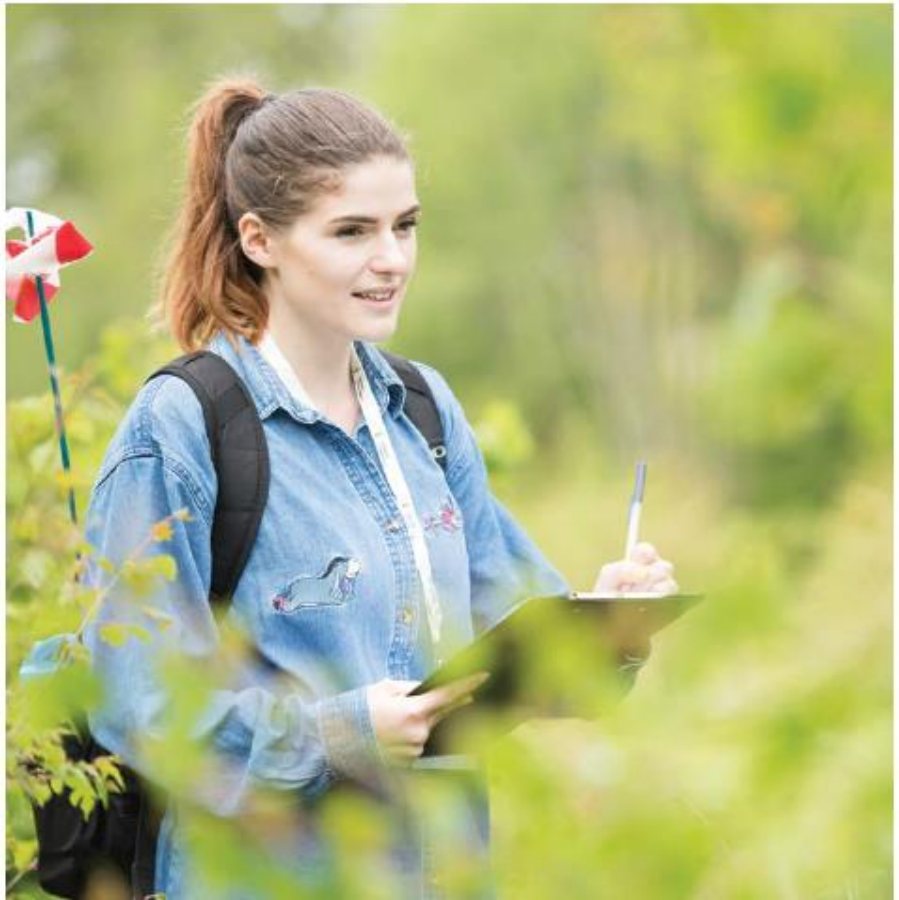
WHY IS THIS MONITORING SO IMPORTANT?

Monitoring builds our knowledge of the natural world, and underpins our efforts to conserve it, and to halt and reverse declines in nature. Measures of abundance and/or distribution, particularly those derived from standardised repeated measurements, allow trends to be calculated and species' status to be determined. Formal assessments such as IUCN Red Lists, which use the best available data to place species in categories of threat using a suite of standardised criteria, are used to identify which species most urgently require conservation attention. Given the squeeze on resources for conservation, such prioritisation is essential for ensuring resources are used efficiently.

Furthermore, repositories of species data are essential tools for spatial planning and defending wildlife from inappropriate development. Datasets on the NBN Atlas and those held by LERCS can aid the identification of the most valuable sites for wildlife, and be used to inform Nature Recovery Network maps. This would enable reserve designation, the targeting of conservation management such as AES and woodland grant schemes, and inform local authorities and developers about sensitive sites and special species.

Finally, by combining data across species, we can look at broader patterns in nature – such as shown by the *State of Nature* headlines, and in the UK Government's biodiversity indicators[8]. Trends in wildlife can tell us about the health of the environment more widely, and what impact human activities are having on it. The reporting of the UK's progress in meeting international targets for biodiversity and sustainability (see page 90) relies heavily on volunteer-collected biodiversity data.

Photo: Ben Andrew (rspb-images.com)



Report written, signed off and printed……

….then what?

Have I Got News For You
@haveigotnews

Quarter of UK animals facing extinction, says report, with the exception of snakes, tits, leeches and weasels which are absolutely thriving in Westminster.

5,262 1:34 PM - Oct 4, 2019

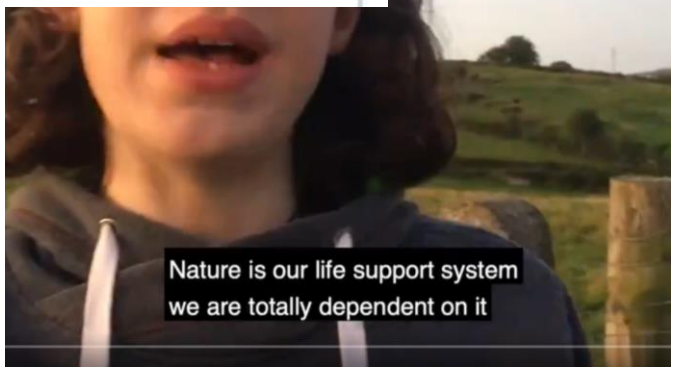
1,161 people are talking about this

newsround

A big report into wildlife has found that more than a quarter of mammals in Britain are facing extinction.

The picture isn't much better across all wildlife species - including animals, birds, insects and fish - with one in seven under threat.

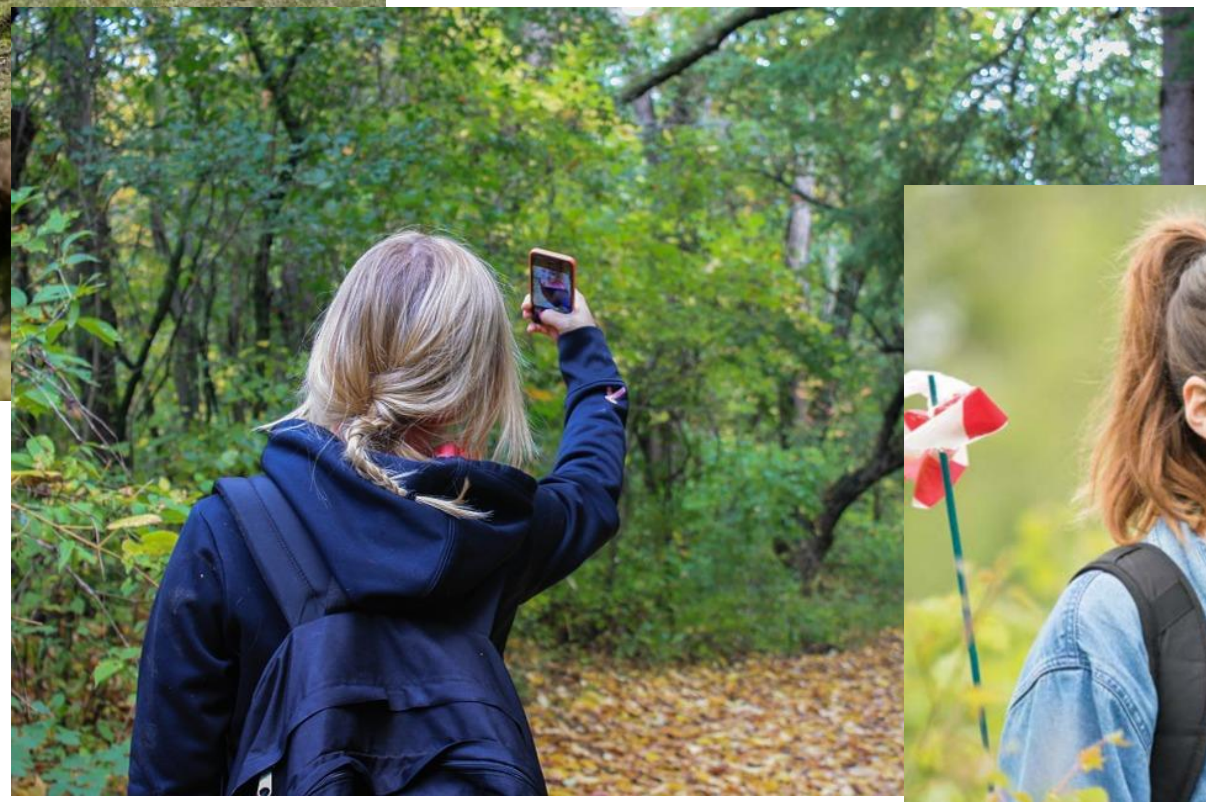
Some of the young ambassadors have been looking into the problem.



Impact

- High public awareness of loss of nature
- Lengthy discussion in Scottish parliament
- New relationship with SNH
- Video shown, and debate planned in Senedd
- Response from Theresa Villiers
- Mailing to all members of parliament/assembly
- **Lays the ground for campaigning to come**

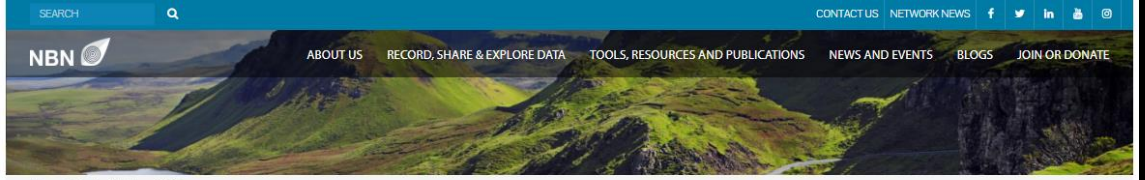
Thank you



state of nature PARTNERSHIP

The *State of Nature 2019* report is a collaboration between the conservation and research organisations listed below:

A Focus On Nature · A Rocha · Action for Conservation · amphibian and reptile conservation · ALERC · Bat Conservation Ireland · Bat Conservation Trust · National Biodiversity Data Centre · BRC · Botanical Society of Britain & Ireland · British Arachnological Society · Biological Society · BDS British Dragonfly Society · British Lichen Society · bms · Pteridological Society · BTO Looking out for birds · buglife · Bumblebee Conservation Trust · Butterfly Conservation · Centre for Ecology & Hydrology · CEDaR · CIEEM · Chester Zoo · The Conchological Society of Great Britain & Ireland · Continuous Plankton Recorder Survey · Durrell · Earthwatch Institute · Freshwater Habitats Trust · Friends of the Earth · froglife · Isle of Man Government · iSpot · Government of Jersey · John Muir Trust · JNCC Joint Nature Conservation Committee · Local Environmental Records Centre Wales · The Mammal Society · Manx BirdLife · The Marine Biological Association · marine conservation society · Marine Ecosystems Research Programme · Marine Life · NBN National Biodiversity Network · NFBR · National Trust · National Trust for Scotland · Natural England · Natural History Museum · Cyfoeth Naturiol Cymru Natural Resources Wales · Northern Ireland Bat Group · NIEA Northern Ireland Environment Agency · Agriculture, Environment and Rural Affairs · ORCA · people's trust for species · Plantlife · Royal Botanic Garden Edinburgh · Kew · rspb giving nature a home · RZSS · Scottish Badgers · Scottish Environment LINK · Scottish Natural Heritage Dualchas Nàdair na h-Alba nature.scot · scottish wild land group · Scottish Wildlife Trust · Shark Trust · States of Guernsey · Trees for Life · Ulster Wildlife · University of Plymouth · The University Of Sheffield. · Vincent Wildlife Trust · WDC · WWT · The Wildlife Trusts · Woodland Trust · WWF · ZSL Let's Work for Wildlife



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STATE OF NATURE 2019

Reports

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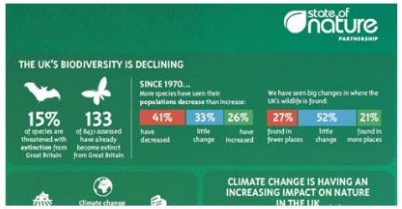

Infographics

Infographics which highlight key findings from the State of Nature 2019

Videos

Short videos which highlight the state of our nature

Additional material

Information which supports sections in the State of Nature 2019

Blogs

Blogs from organisations which contributed to the State of Nature 2019

www.nbn.org.uk/stateofnature2019