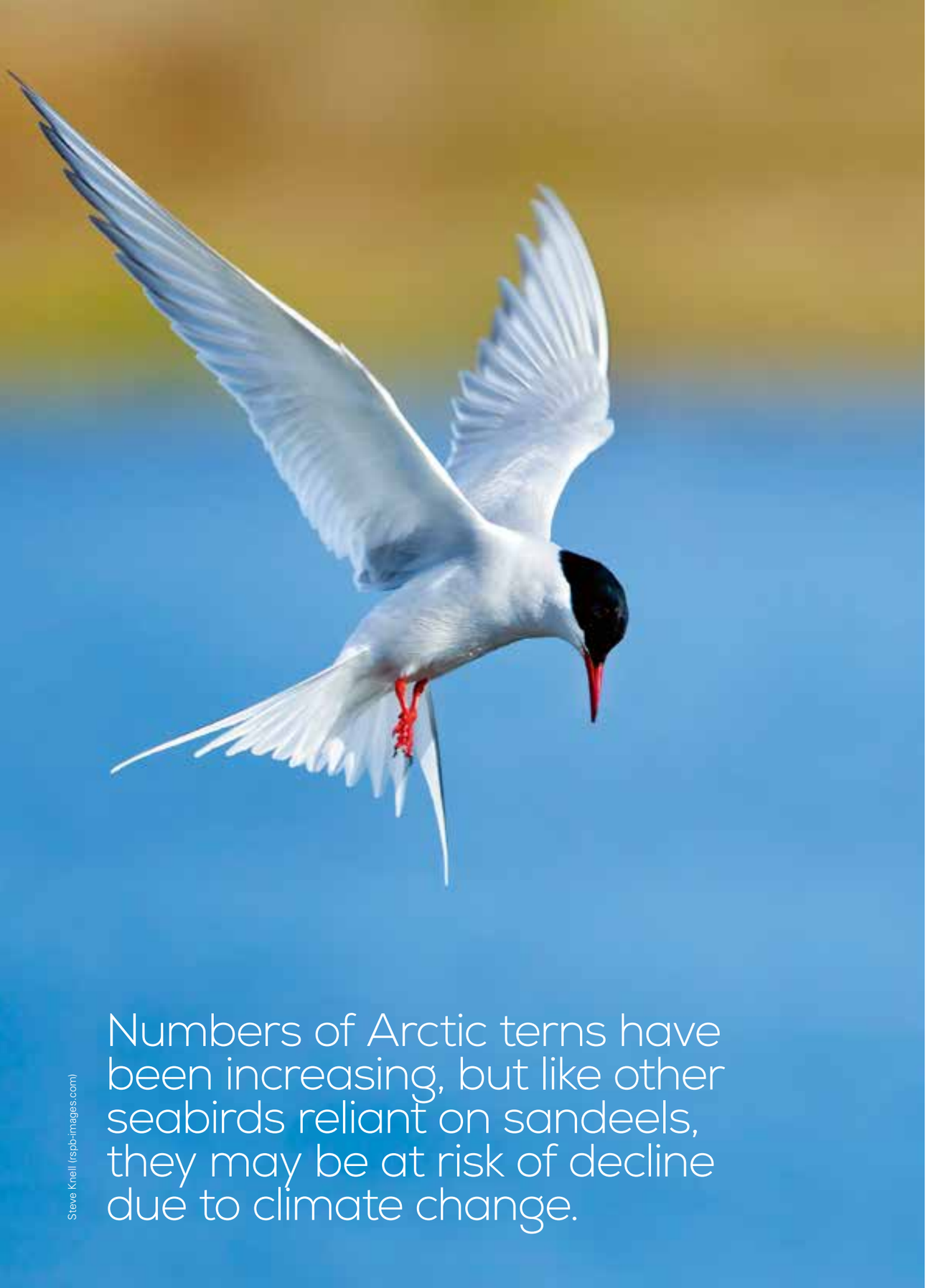
# The state of the UK's birds

2017



Numbers of Arctic terns have been increasing, but like other seabirds reliant on sandeels, they may be at risk of decline due to climate change.

Steve Knell (rspb-images.com)

# Contents



All bird species are shown in **bold**. There are now 67 species identified as being of the greatest conservation concern that are **Red**-listed, 96 species of moderate concern that are **Amber**-listed and 81 species of least concern that are **Green**-listed as identified by *Birds of Conservation Concern 4* (BoCC4). Non native species are shown in black.


This report should be referenced as: Hayhow DB, Ausden MA, Bradbury RB, Burnell D, Copeland AI, Crick HQP, Eaton MA, Frost T, Grice PV, Hall C, Harris SJ, Morecroft MD, Noble DG, Pearce-Higgins JW, Watts O, Williams JM, *The state of the UK's birds 2017*. The RSPB, BTO, WWT, DAERA, JNCC, NE and NRW, Sandy, Bedfordshire.

The UK's population of common scoters has declined severely.

Andy Hay (rspb-images.com)

# Headlines

- Climate change will provide opportunities for some species, while others will be more vulnerable.
- Birds in the UK are showing changes in abundance and distribution, predominantly moving northwards, in a way that is consistent with a changing climate.
- Migratory birds are arriving earlier and egg-laying dates have advanced such that **swallows**, for example, are arriving in the UK 15 days earlier, and breeding 11 days earlier, than they did in the 1960s.
- A large number of bird species are likely to have opportunities for colonisation and range expansion in the UK under projected climate change. Potential colonists include a number of wetland species such as **little bittern** and **night heron**. A considerable list of southerly-distributed species have already shown substantial increases in recent years, including **garganey**, **quail** and **little egret**.
- Climate change will increase the pressures on species already in decline. A number of our declining rare breeding birds, including **dotterel**, **whimbrel**, **common scoter** and **Slavonian grebe**, are likely to be at a higher risk of extinction in the UK, based on projections of how climate will become less suitable for them.
- The UK's **kittiwake** population has declined by 70% since 1986 because of falling breeding success and adult survival. Climate change has reduced the availability of the sandeels they rely upon in the breeding season. Other species that feed largely on sandeels, such as **Arctic skua**, **Arctic tern** and **puffin**, are at high risk of climate-related decline.
- National surveys provided updated population estimates for **capercaillie** and **hen harrier** and revealed declines for both species.
- In the UK Overseas Territories, there are positive signs of recovery for four endemic land birds on Henderson Island and updates on a successful translocation project for the **cahow**.

# Introduction

*The state of the UK's birds* (*SUKB*) report provides a one-stop shop for the results from annual, periodic and one-off surveys and monitoring studies of birds.

Since 1999, these reports have provided an annual overview of the status of bird populations in the UK and its Overseas Territories. We present trends for as many of the UK's regularly occurring species as possible. The 2017 edition also focuses on the considerable impact climate change has had, is currently having and is likely to have in the future on bird populations in the UK.

Climate change is widely cited as one of the most significant threats to the world's biodiversity, and one that is projected to become increasingly severe through the course of this century. Large-scale monitoring programmes, such as those reviewed annually in *SUKB*, have provided data for a number of cross-species analyses to examine the impacts of climate change.

We review this research to present the current evidence for how climate change is already affecting our bird life. Projections of how species populations are likely to respond to climate change in the future are examined. We highlight those species considered particularly vulnerable to, or potentially able to benefit from, climate change, bearing in mind the many other drivers that are likely to interact with climate change. In the light of this evidence, we discuss the conservation response required to meet the challenges presented by climate change in order to maintain and, where possible, enhance the status of our bird life.

## A special thank you to volunteers

Bird monitoring in the UK is led by non-governmental organisations (NGOs) and the UK's statutory nature conservation bodies. However, such monitoring would not be possible without the efforts of many thousands of volunteers. Without their time and dedication, the evidence base on which bird conservation in the UK depends would simply not exist.

Many thousands of people take part in bird monitoring each year in the UK. The vital data for analyses to detect large-scale and long-term patterns, and to identify where pressures, such as climate change, may be affecting populations, come from the monitoring programmes and surveys featured in *SUKB*. The amount of time each person spends may vary – from the commitment of carrying out monthly counts, to the casual records submitted to BirdTrack – but every contribution is valuable and adds to the expanding evidence base. If you are one of these volunteers, thank you. If not, how about getting involved in one of the wide variety of monitoring opportunities outlined on pages 52–53 of this report?

### The *SUKB* partnership

*SUKB 2017* is produced by a coalition of three NGOs: the Royal Society for the Protection of Birds (RSPB), the British Trust for Ornithology (BTO) and the Wildfowl & Wetlands Trust (WWT), together with the UK's statutory nature conservation bodies: the Department of Agriculture, Environment and Rural Affairs, Northern Ireland (DAERA), the Joint Nature Conservation Committee (JNCC), Natural England (NE), Natural Resources Wales (NRW) and Scottish Natural Heritage (SNH).

# Wild bird indicators

The UK wild bird indicators are high-level measures of the state of bird populations. They show relative changes in the abundance of common and widespread native birds of farmland, woodland, freshwater and marine habitats. In conjunction with indicators for other well-monitored groups, such as butterflies and bats, they are used as a proxy for the overall state of biodiversity, to track progress towards targets for conserving the natural environment and for sustainable development goals.

The indicators are shown by habitat type. They present the average population trends for breeding bird species associated with farmland, woodland and wetlands, and for seabirds (page 25) and wintering waterbirds (page 41). The bar chart provided alongside each habitat chart (see opposite) shows the percentage of species within that indicator that have increased, decreased or shown no change. While the indicators communicate broad trends and are a good tool for summarising these changes, it is important to note that there is considerable variation in the individual species' trends that go into the indicator.

## UK wild bird indicators: farmland, woodland and wetland

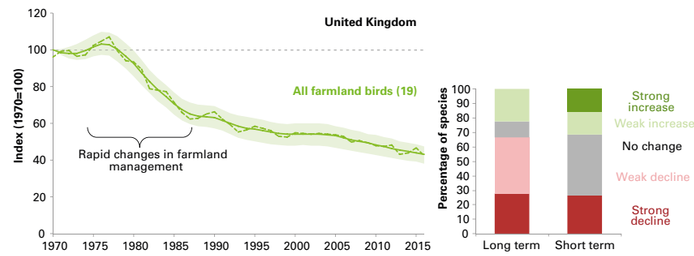
Trends in common and widespread breeding birds are included in the farmland, woodland and wetland indicators.

- The farmland indicator remains at less than half its 1970 starting value, while over the short term, between 2010 and 2015, the smoothed index has decreased by 9%. Agricultural management during the period has had a greater impact on farmland birds than other factors such as climate change.
- The woodland bird indicator is 23% lower than its 1970 level, showing no significant change over the short term. The climatic conditions of woodlands in the UK might become more suitable for some species in the indicator, such as the **lesser spotted woodpecker** and **nightingale.** But such changes are unlikely to counterbalance other negative drivers causing declines in woodland birds. Other species, particularly long-distance migrants, such as the **pied flycatcher** and **tree pipit**, may be vulnerable to ongoing changes in the timing of insect availability on their breeding grounds, and the impacts of climate change on their wintering grounds affecting overwinter survival.
- The water and wetland bird index is 8% lower than the 1975 starting value, having remained relatively stable until the mid-2000s. The smoothed index was 2% lower in 2015 than it was in 2010. The arrival and subsequent population expansion of **Cetti's warblers** breeding in the UK since 1973 is seen as an example of the northward shift in distribution of some species as a result of climate change.

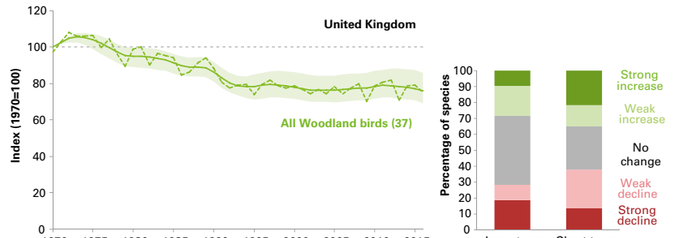
David J Slater (rspb-images.com)

**Long-distance migrants like pied flycatchers may have trouble finding insect prey on their breeding grounds.**

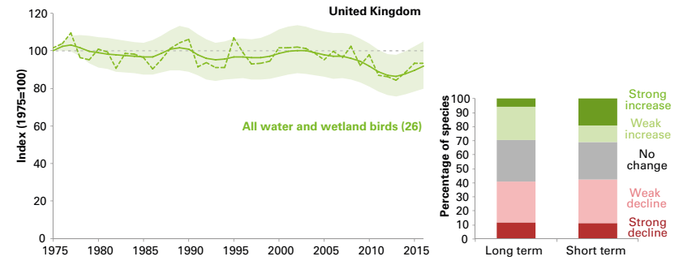
**Breeding farmland birds in the UK, 1970 to 2016.**




**Breeding woodland birds in the UK, 1970 to 2016.**




**Breeding wetland birds in the UK, 1975 to 2016.**




The figure in brackets shows the number of species used in the indicator.

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

The bar chart shows the percentage of species within the indicator that have increased, declined, or shown no change (based on set thresholds of change). Whether an individual species is increasing or decreasing has been decided by its rate of annual change over the time period (long or short) of assessment. If the rate of annual change would lead to a population decrease of between 25% and 49% over 25 years, the species is said to have shown a "weak decline". If the rate of annual change would lead to a population decrease of 50% or more over 25 years, the species is said to have shown a "strong decline". The corresponding values for increases are between a 33% and a 100% increase over 25 years (weak increase) or greater than 100% (strong increase). These thresholds are the same as used to define severe and moderate levels of decline in the Birds of Conservation Concern status assessment for birds in the UK.

For details of species' trends in each indicator, download the datasheet: **https://www.gov.uk/government/statistical-data-sets/env07-wild-bird-populations-in-the-uk**

Source: BTO, Defra, JNCC and RSPB

Tony Hamblin (rspb-images.com)

Lesser spotted woodpecker numbers have fallen since the 1970s.

# Common and widespread breeding birds

Keeping tabs on population changes in our common and widespread birds allows us to gain an insight into the overall health of the environment around us, as shown by the regular summaries of trends presented in the UK wild bird indicators (see page 9). However, knowing how individual species are faring is essential for directing conservation efforts and monitoring the effectiveness of this work.

Data from the Breeding Bird Survey (BBS) and its predecessor survey, the Common Birds Census (CBC), can be combined to provide long-term population trends dating back to the 1960s.

In 2016, Breeding Bird Survey data alone enabled population trends to be calculated for 111 species of breeding birds, monitoring population change since 1994. In order to obtain these data, 2,796 volunteers surveyed a record breaking 3,837 1-km BBS squares.

The Waterways Breeding Bird Survey (WBBS) and its predecessor survey, the Waterways Bird Survey (WBS), fill a gap in our knowledge of specialist species of linear waterways, such as **grey wagtails**, **sand martins**, **dippers**, **kingfishers** and **common sandpipers**. Population trends can be calculated since 1970 using WBBS and WBS data combined. Although the BBS does report trends, the WBBS is thought to provide a better measure of population change in these species, which are very much dependent on waterways habitats. In addition, for these species and others, we can make informative comparisons between trends across all habitats (from BBS) and the waterway-specific trends produced by WBBS.

The table opposite (continued overleaf) presents trends in 108 breeding bird species, along with notes about the sources of data. Where possible, trends are given for two periods: long-term (1970–2015) and BBS trend (1995–2015). As well as the CBC, BBS, WBS and WBBS, trends in the **grey heron** population are reported using the oldest single-species survey in the world: the BTO Heronries Census, which has been monitoring **grey herons** since 1928.

Ben Andrew (rspb-images.com)

**The Waterways Breeding Bird Survey provides information on kingfishers.**

| Species | Long-term trend % (1970–2015) | BBS trend % (1995–2015) | BoCC4 |
|---|---|---|---|
| Mute swan | 192 | 26 | |
| Greylag goose | na | 232 | |
| Canada goose | na | 75 | |
| Shelduck[1] | 131 | -5 | |
| Mandarin | na | 405 | |
| Gadwall | na | 131 | |
| Mallard | 100 | 18 | |
| Tufted duck | na | 43 | |
| Goosander | na | 21 | |
| Red grouse | na | 13 | |
| Red-legged partridge | -26 | 6 | |
| Grey partridge | -92 | -60 | |
| Pheasant[1] | 70 | 29 | |
| Grey heron[2] | -5 | -17 | |
| Little grebe | na | 42 | |
| Great crested grebe | na | 10 | |
| Red kite | na | 1231 | |
| Sparrowhawk[3] | 65 | -16 | |
| Buzzard[1] | 465 | 84 | |
| Kestrel[1] | -50 | -38 | |
| Hobby | na | -12 | |
| Peregrine | na | -13 | |
| Moorhen | -27 | -12 | |
| Coot | 56 | 17 | |
| Oystercatcher | na | -23 | |
| Golden plover | na | -20 | |
| Lapwing | -64 | -43 | |
| Snipe | na | 19 | |
| Curlew[1] | -65 | -48 | |
| Common sandpiper[2] | -46 | -34 | |
| Redshank | na | -38 | |
| Feral pigeon | na | -21 | |
| Stock dove[1] | 113 | 20 | |
| Woodpigeon | 123 | 35 | |
| Collared dove[3] | 311 | 3 | |
| Turtle dove | -98 | -94 | |
| Ring-necked parakeet | na | 1455 | |
| Cuckoo[1] | -56 | -43 | |
| Barn owl | na | 217 | |
| Little owl | -64 | -57 | |
| Tawny owl | -37 | -28 | |
| Swift | na | -51 | |
| Kingfisher[2] | -17 | -4 | |
| Green woodpecker[1] | 100 | 31 | |
| Great spotted woodpecker | 349 | 130 | |
| Magpie | 97 | -2 | |
| Jay | 8 | 19 | |
| Jackdaw | 149 | 54 | |
| Rook | na | -20 | |
| Carrion crow[1] | 98 | 18 | |
| Hooded crow | na | 17 | |
| Raven | na | 46 | |
| Goldcrest[1] | -15 | 11 | |
| Blue tit | 21 | 1 | |

For most species, long-term trends and short-term trends are based on smoothed estimates of change in the UK between 1970 and 2015, and 1995 and 2015 respectively. Although all data, including the most recent from 2016, are included in analyses, we report measures of change to the penultimate year (2015), to avoid unreliable effects due to smoothing at the endpoints of time series.

Exceptions to these time periods are identified in the table and explained below:
1. For most species, the long-term trends are based on the smoothed estimates of change between 1970 and 2015 in a combined CBC–BBS analysis. However, for species with evidence of marked differences in the populations monitored by the BBS and its predecessor the CBC, we use the CBC results to 1994 anchored to the BBS from 1994 to 2015. Hence, long-term trends for these species may not be representative of the UK population prior to 1994, due to the more limited geographical and habitat coverage of the CBC (mainly farmland and woodland sites in England).

2. For five riverine species a smoothed trend for both time periods is calculated by combining the WBS and WBBS data as follows: 1975–2015 for **grey wagtails**, **dippers**, **kingfishers** and **common sandpipers** and 1978–2015 for **sand martins**. For **grey herons**, the trend is based on the Heronries Census (1982–2015) (page 52).

3. Long-term trends cover shorter time periods for three species due to the later availability of reliable data, as follows: 1972–2015 for **collared doves**, 1975–2015 for **sparrowhawks** and 1977–2015 for **house sparrows**.

na = trends not available

More details on the BBS, including *The Breeding Bird Survey 2016* report, can be found at **bto.org/bbs**

BTO/JNCC/RSPB Breeding Bird Survey and Waterways Breeding Bird Survey data were provided by a partnership jointly funded by the BTO, RSPB and JNCC, with fieldwork conducted by volunteers. The Waterways Breeding Bird Survey received significant previous support from the Environment Agency.

More details on the BBS, including the Breeding Bird Survey 2016 report, can be found at **bto.org/bbs**

Chris Knights (rspb-images.com)

# Farmland birds like corn buntings need help to survive alongside modern farming practices.





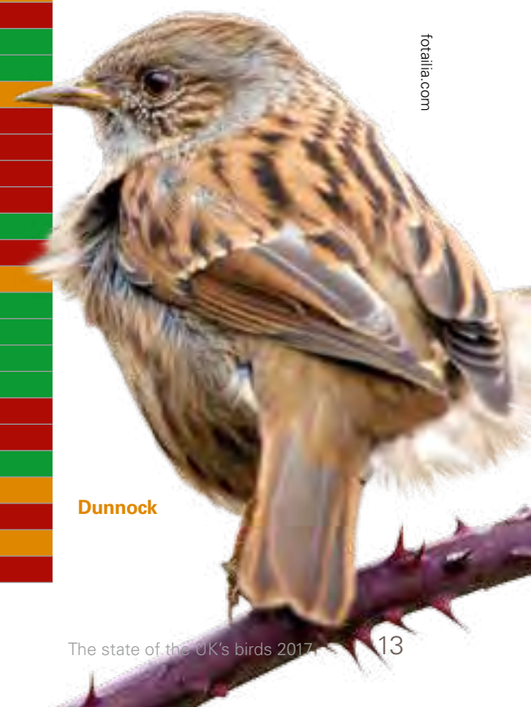
| Species | Long-term trend % (1970–2015) | BBS trend % (1995–2015) | BoCC4 |
|---|---|---|---|
| Great tit | 81 | 37 | |
| Coal tit | 16 | 0 | |
| Willow tit | -93 | -80 | |
| Marsh tit | -75 | -41 | |
| Skylark[1] | -59 | -22 | |
| Sand martin[2] | 7 | -30 | |
| Swallow | 8 | 18 | |
| House martin[1] | -48 | -11 | |
| Long-tailed tit[1] | 98 | 17 | |
| Wood warbler | na | -57 | |
| Chiffchaff | 104 | 109 | |
| Willow warbler[1] | -44 | -11 | |
| Blackcap | 289 | 145 | |
| Garden warbler | -10 | -23 | |
| Lesser whitethroat | 22 | 6 | |
| Whitethroat | 6 | 30 | |
| Grasshopper warbler | na | -17 | |
| Sedge warbler | -28 | -9 | |
| Reed warbler | 112 | 17 | |
| Nuthatch | 252 | 90 | |
| Treecreeper | -10 | 9 | |
| Wren | 68 | 32 | |
| Starling[1] | -81 | -51 | |
| Dipper[2] | -22 | -6 | |
| Blackbird | -16 | 22 | |
| Song thrush | -50 | 22 | |
| Mistle thrush | -55 | -25 | |
| Spotted flycatcher | -85 | -38 | |
| Robin | 55 | 25 | |
| Nightingale | na | -48 | |
| Pied flycatcher | na | -41 | |
| Redstart | 72 | 43 | |
| Whinchat | na | -51 | |
| Stonechat | na | 53 | |
| Wheatear | na | -16 | |
| Dunnock | -29 | 23 | |
| House sparrow[3] | -66 | -6 | |
| Tree sparrow[1] | -90 | 119 | |
| Yellow wagtail | -67 | -42 | |
| Grey wagtail[2] | -39 | 4 | |
| Pied wagtail | 39 | 0 | |
| Tree pipit | -69 | 8 | |
| Meadow pipit[1] | -34 | -7 | |
| Chaffinch | 21 | -2 | |
| Greenfinch | -46 | -46 | |
| Goldfinch[1] | 159 | 122 | |
| Siskin | na | 61 | |
| Linnet[1] | -55 | -21 | |
| Lesser redpoll[1] | -87 | 27 | |
| Common crossbill | na | -2 | |
| Bullfinch | -39 | 10 | |
| Yellowhammer | -56 | -16 | |
| Reed bunting | -31 | 31 | |
| Corn bunting | -89 | -34 | |

Andy Hay (rspb-images.com)

**The wood warbler is one of many woodland species in decline.**

John Bridges (rspb-images.com)

**The nuthatch is expanding its range further north in Scotland.**

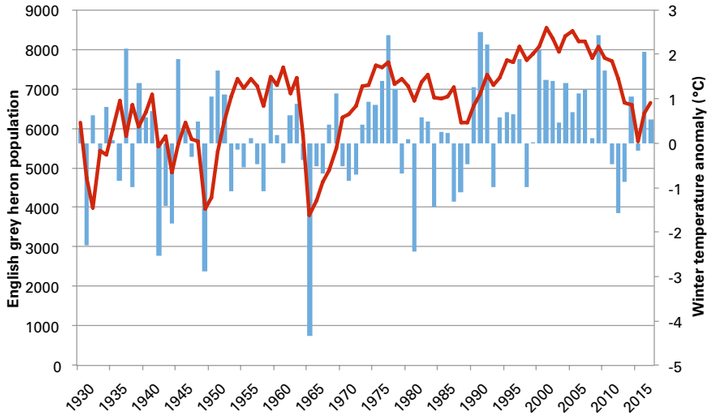


fotolia.com

**Dunnock**

The BTO Heronries Census shows how England's **grey heron** population has experienced marked fluctuations (line) in response to the previous winter's temperatures (bars), but with an overall increase of 25% since 1928.*

Winter temperature anomaly is the temperature for each year minus the mean winter temperature over the period of monitoring.

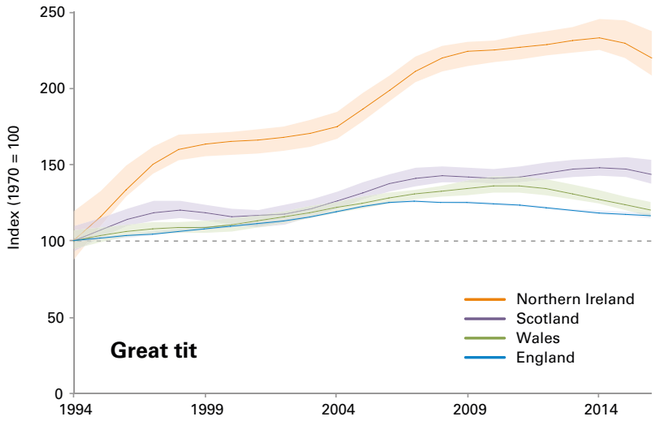


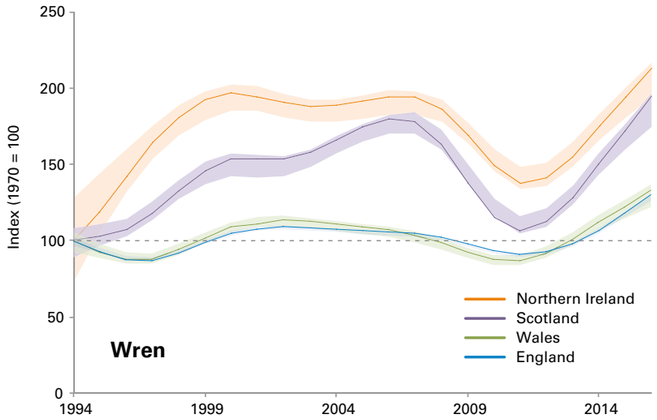

## Resident species trends vary geographically

Resident species such as **great tits**, **wrens** and **nuthatches** appear to be benefitting from milder winters.

Country-specific trends for **great tits** and **wrens** show that increases have been greatest in Northern Ireland, followed by Scotland, with no significant difference between England and Wales. These patterns are likely to be caused by overall population increases and improving climatic conditions in the north and west.

For more details, see: **bto.org/bbs-results**




**Milder winters have helped great tits.**

Grahame Madge (rspb-images.com)





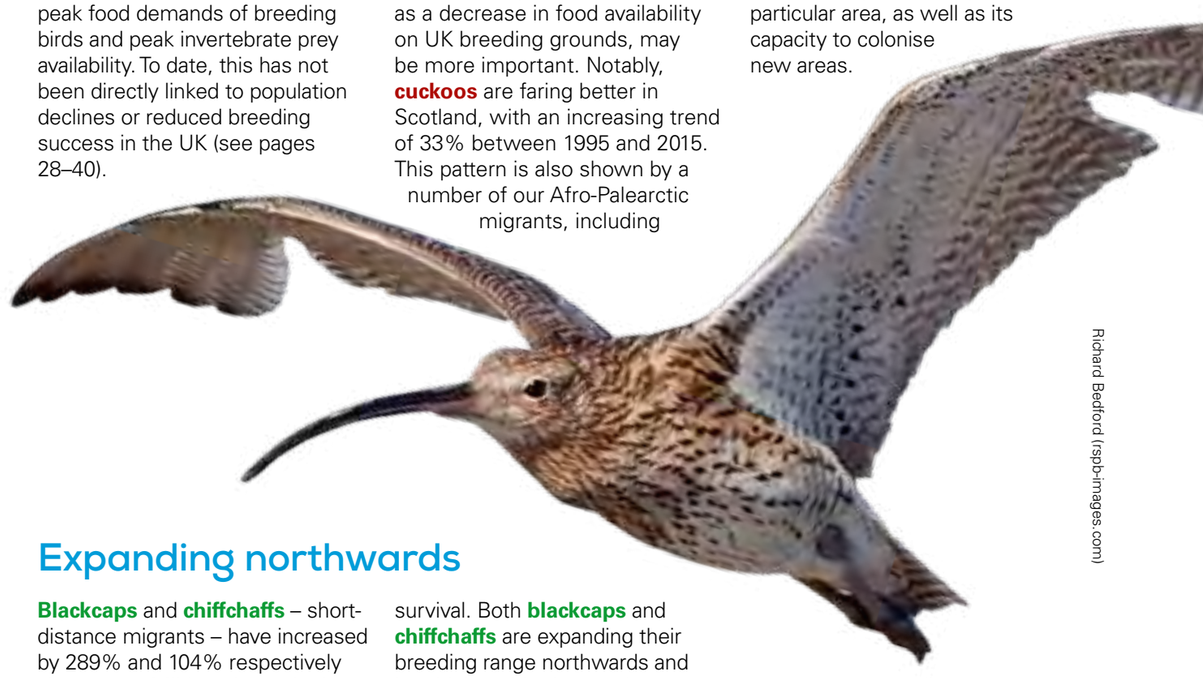
## Adaptability

As the climate changes, adaptability will be essential in enabling bird populations to persist. The **great tit** is one of a number of species, including **swallows**, **chiffchaffs** and **willow warblers**, to have advanced its egg-laying date; **great tits** lay their eggs on average 11 days earlier than they did in 1968. Despite these changes in timing, there remains the potential for a mismatch in the timing of the peak food demands of breeding birds and peak invertebrate prey availability. To date, this has not been directly linked to population declines or reduced breeding success in the UK (see pages 28–40).

The ability to adapt to a changing environment varies between species. **Cuckoos** populations declined by 43% in the UK between 1995 and 2015.

Whilst some have suggested that this could be due to advances in the egg-laying date of host species such as **dunnocks** and **reed warblers**, there is little evidence for this in the UK. Other factors during migration, as well as a decrease in food availability on UK breeding grounds, may be more important. Notably, **cuckoos** are faring better in Scotland, with an increasing trend of 33% between 1995 and 2015. This pattern is also shown by a number of our Afro-Palearctic migrants, including **willow warblers**, **house martins** and **tree pipits**.

Habitat extent and distribution will change as a result of climate change as well as other factors, and this has implications for the ability of species to respond. While a species may be able to alter the timing of life history events for instance, the availability of suitable habitat will ultimately determine whether a species can persist in a particular area, as well as its capacity to colonise new areas.



Richard Bedford (rspb-images.com)

**Around one quarter of the world's curlews breed in the UK.**

## Expanding northwards

**Blackcaps** and **chiffchaffs** – short-distance migrants – have increased by 289% and 104% respectively since 1970. Milder winters in the UK and Europe, where increasing numbers of both species stay for the winter, boost overwinter survival. Both **blackcaps** and **chiffchaffs** are expanding their breeding range northwards and into higher altitudes, as the climatic conditions become more favourable.

## Pressures on upland birds

The decline in the **curlew** population is of great concern, especially when it is considered that the UK supports around a quarter of the global breeding population. Afforestation, overgrazing and predation are likely to be key drivers of decline.

In addition, the drying of soils on the breeding grounds, which is already a problem due to the drainage of lowland meadows and upland bogs, may be exacerbated by climate change. Wetter areas are important sources of insects which breeding waders, such as **curlews** and **golden plovers**, feed to their young. **Curlews** have declined by 65% between 1970 and 2015 across the UK, and **golden plovers** by 31% between 1995 and 2015 in Scotland.

David Kjaer (rspb-images.com)

The UK was home to 164 booming male bitterns in 2017.



# Scarce and rare breeding birds

The Breeding Bird Survey allows us to monitor trends in more than 100 of our most common and widespread breeding birds. However, its non-targeted approach means that rarer breeding species, or those with restricted ranges, are encountered too infrequently for population trends to be derived.

Different approaches are needed to ensure that these species, many of which are high conservation priorities, are monitored. Much of the data on these species is collated by the Rare Breeding Birds Panel (RBBP), for the most part based on the records collected by volunteer birdwatchers. In some cases, the RBBP simply reports the efforts of focused annual monitoring on species of high conservation interest, such as **bitterns** and **Slavonian grebes**, but in many cases it provides a unique synthesis by compiling data from many sources.

The degree to which species are monitored adequately by the RBBP varies considerably between species; for some it is complete, or virtually so, whereas for others, data are available for only a small proportion of the population, may vary between years, or are biased in other ways. This is particularly true for some of the scarce species covered by the RBBP, and those that have distributions away from reserves, popular birdwatching locations, and well-populated areas.

For such species, bespoke surveys repeated at regular intervals, such as those conducted under the Statutory Conservation Agency and RSPB Annual Breeding Bird Scheme (SCARABBS), provide the data required to inform conservation decision-making. Here we collate information from the most appropriate sources to give an update on trends in scarce and rare breeding birds. In addition, we consider the impact that climate change might have upon these species, for better or worse.

Mark Sisson (rspb-images.com)

**The UK's Slavonian grebe population declined by 61% over 25 years.**

| Species[1] | Population estimate[2] | Trend (% change) | Trend source and period[3] | BoCC4 |
|---|---|---|---|---|
| Whooper swan | 26 | 584 | RBBP | |
| Pintail | 25 | -14 | RBBP | |
| Garganey | 97 | 35 | RBBP | |
| Pochard | 685 | 157 | RBBP | |
| Common scoter | 37 | -43 | RBBP | |
| Goldeneye | 200 (APEP) | Increase | RBBP | |
| Quail | 728 | 43 | RBBP | |
| Black grouse | 5,100 (2005) | -80 | SCARABBS (1991/92-2005) | |
| Capercaillie | 1,114 (2015/16) | -49 | SCARABBS (1992/93/94-2015/16) | |
| Red-throated diver | 1,300 (2006) | 38 | SCARABBS (1994-2006) | |
| Black-throated diver | 220 (2006) | 16 | SCARABBS (1985-2006) | |
| Bittern | 164 (2017) | 604 | Annual surveys (1988/92-2013/17) | |
| Little egret | 921 | Large increase | RBBP | |
| Spoonbill | 12 | Increase | RBBP | |
| Slavonian grebe | 28 | -57 | Annual surveys | |
| Black-necked grebe | 54 | 44 | RBBP | |
| Honey buzzard | 40 | 219 | RBBP | |
| White-tailed eagle | 102 (2016) | 902 | Annual surveys (1987/91-2012/16) | |
| Marsh harrier | 365 | 479 | RBBP | |
| Hen harrier | 545 (2016) | 2 | SCARABBS (1988/89-2016) | |
| Montagu's harrier | 10 | -15 | RBBP | |
| Goshawk | 542 | 274 | RBBP | |
| Golden eagle | 508 (2015) | 16 | SCARABBS (1982-2015) | |
| Osprey | 225 | 342 | RBBP | |
| Spotted crake | 29 | 16 | RBBP | |
| Corn crake | 1200 | 146 | Annual surveys (1993-2011/2015) | |
| Crane | 24 | 1,883 | RBBP | |
| Stone-curlew | 399 | 196 | RBBP | |
| Avocet | 1,791 | 368 | RBBP | |
| Dotterel | 423 (2011) | -57 | SCARABBS (1987/88-2011) | |
| Little ringed plover | 1,200 (2007) | 80 | Surveys (1984-2007) | |
| Whimbrel | 300 (2009) | >-50 | Surveys (1995-2009) | |
| Black-tailed godwit | 54 | -1 | RBBP | |
| Ruff | 8 | -72 | RBBP | |
| Purple sandpiper | 1 | -50 | RBBP | |
| Red-necked phalarope | 49 | 195 | RBBP | |
| Green sandpiper | 3 | Increase | RBBP | |
| Wood sandpiper | 29 | 663 | RBBP | |
| Mediterranean gull | 889 | 9,158 | RBBP | |
| Yellow-legged gull | 3 | Increase | RBBP | |
| Lesser-spotted woodpecker | 1,000-2,000 (APEP) | -83 | CBC-BBS joint trend (1970-2015) | |
| Merlin | 1,100 (2008) | 94 | SCARABBS (1983/84-2008) | |
| Hobby | 2,800 (APEP) | 172 | RBBP | |
| Peregrine falcon | 1,505 (2014) | 5 | SCARABBS (1992-2014) | |
| Golden oriole | 2 | -93 | RBBP | |
| Red-backed shrike | 4 | -50 | RBBP | |
| Chough | 354 (2014) | -1 | SCARABBS (1982-2014) | |
| Firecrest | 981 | 1063 | RBBP | |
| Bearded tit | 595 | 64 | RBBP | |
| Woodlark | 3,100 (2006) | 1,086 | SCARABBS (1986-2006) | |
| Cetti's warbler | 1,827 | 718 | RBBP | |
| Dartford warbler | 3,200 (2006) | 70 | RBBP | |
| Savi's warbler | 5 | -65 | RBBP | |
| Marsh warbler | 8 | -66 | RBBP | |
| Ring Ouzel | 5,332 (2012) | -72 | Atlas & SCARABBS (1988/91-2012) | |
| Fieldfare | 2 | -80 | RBBP | |
| Redwing | 19 | -54 | RBBP | |
| Black redstart | 56 | -45 | RBBP | |
| Cirl bunting | 1,079 (2016) | 814 | SCARABBS (1989-2016) | |



**Notes for table (opposite)**

1 Trends for three rare breeding seabirds – **Arctic skuas**, **roseate terns** and **little terns** – are presented on page 27.

2 Population estimates are based on the most recent survey results (with the year of origin in parentheses), or means of RBBP or annual survey totals from the five years 2011–2015. For species for which RBBP totals may underestimate numbers, we have used alternative estimates from the Avian Population Estimates Panel (Musgrove, *et al.* (2013) *British Birds* 106: 64–100). For those well-monitored species with increasing populations, we have used the most recently available year of data. Numbers are pairs, territories or units which are likely to be equivalent to breeding pairs, but for the RBBP, numbers are based on possible breeding attempts and include, for example, single territorial male birds and so do not necessarily equate to successful breeding attempts. Thus for the **golden oriole** we present an average population of two, based on the continued occurrence of small numbers of unpaired birds each spring. The estimate for the **capercaillie** is individuals counted in the winter.

3 RBBP and annual survey trends are five-year means calculated for a 25-year period between 1986–1990 and 2011–2015. The trend periods for those species covered by periodic surveys, such as under SCARABBS, are given. RBBP trends for **common scoters** and **spotted crakes** have been given despite SCARABBS coverage, as they allow a 25-year trend to be given rather than just 12 years between surveys. Species that have colonised the UK since the start of the 25-year period cannot have percentage figures calculated, so we have just noted that an increase has occurred.



Red-throated divers breed on remote lochs in north and west Scotland.

Chris Gomersall (rspb-images.com)

# Scarce and rare breeding birds: opportunity and vulnerability

Our rare breeding birds often occur here at the edge of their breeding ranges. For the very smallest populations, this means that the risk of extinction is very high, but most of the species in this section are vulnerable to chance effects and can also be very sensitive to changes in the environment around them.

Projections of how climate change would influence the ranges of birds across Europe have been tested against past population trends for rare breeding birds in the UK, and a positive relationship was found. The UK's rare breeders have been responding to climate change as predicted, both positively and negatively.

Species currently only found to the south of the UK are projected to shift north and east, and to higher elevations as the climate there becomes more suitable. Conversely, those birds which have their southern, "trailing" range edge within the UK are likely to decline as that edge moves north, or even moves out of the UK altogether.

A recent review assessed which species might go extinct as regular breeding species in the UK, based on both current population trends and projections of climate-driven range shifts, assuming a 3°C rise in global temperatures above pre-industrial times. A species was considered to be at risk if the UK's future climate is expected to become very unsuitable for it and it has declined here since 1990. The review also identified likely avian colonists, using the same modelling approach and evidence of recent increases in north-west Europe.

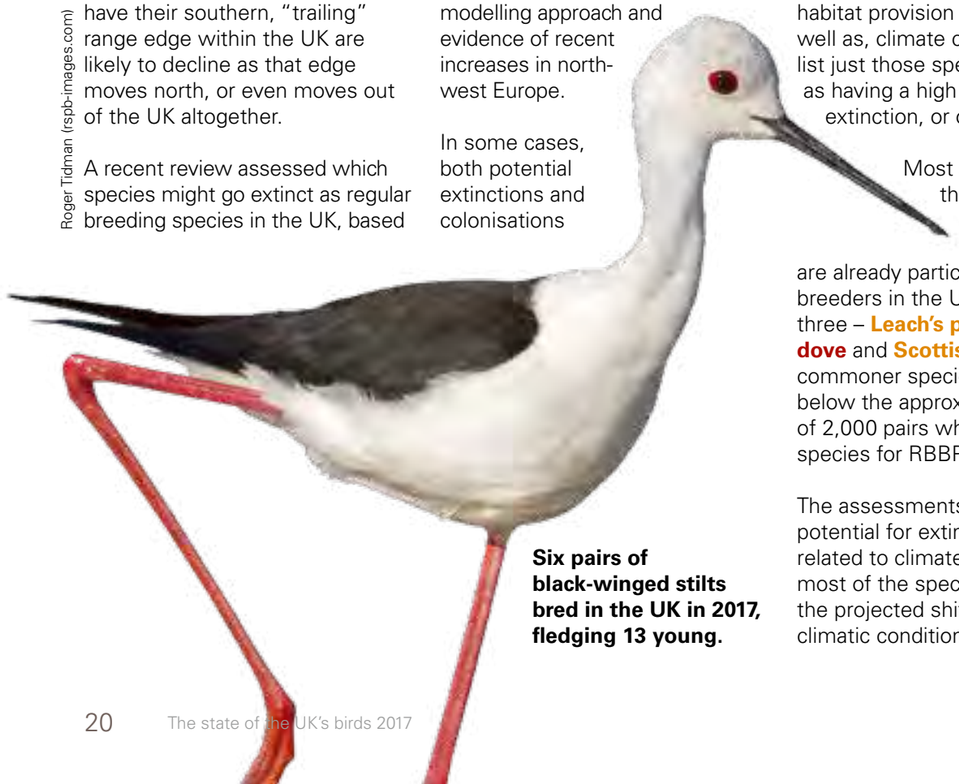
| Species with a high likelihood of extinction* | Habitat | Species with a high likelihood of extinction* | Habitat |
|---|---|---|---|
| Purple sandpiper | Upland | Turtle dove** | Farmland |
| Whimbrel | Upland | Brambling | Woodland |
| Snow bunting | Upland | Parrot crossbill | Woodland |
| Dotterel | Upland | Scottish crossbill | Woodland |
| Common scoter | Wetland | Capercaillie | Woodland |
| Slavonian grebe | Wetland | Redwing | Woodland |
| Ruff | Wetland | Willow tit** | Woodland |
| Pintail | Wetland | Arctic skua | Seabird |
| Marsh warbler | Wetland | Leach's petrel | Seabird |

*Risk of extinction assessed following method described in Ausden *et al* 2015.
**For completeness, **turtle doves** and **willow tits** included due to rate of current decline, despite projections for climate to remain suitable.

In some cases, both potential extinctions and colonisations might be driven by factors other than climate change. The recent rapid decline in **turtle doves**, which is giving rise to fears of extinction for this much-loved species, appears to be unrelated to climate change. Likewise, increases in some southern European wetland species, such as egrets, may be related to better protection and habitat provision instead of, or as well as, climate change. Here we list just those species assessed as having a high likelihood of extinction, or of colonisation.

Most of the species thought to have a high likelihood of extinction are already particularly rare as breeders in the UK. However, three – **Leach's petrel**, **turtle dove** and **Scottish crossbill** – are commoner species, not currently below the approximate threshold of 2,000 pairs which qualifies a species for RBBP monitoring.

The assessments of high potential for extinction are related to climate change for most of the species listed, as the projected shifts in suitable climatic conditions mean that the



Roger Tidman (rspb-images.com)

**Six pairs of black-winged stilts bred in the UK in 2017, fledging 13 young.**





| Species with high likelihood of colonisation | Habitat | Species with high likelihood of colonisation | Habitat |
|---|---|---|---|
| Black kite | Wetland | Black-winged stilt | Wetland |
| [White-spotted] Bluethroat | Wetland | Short-toed eagle | Farmland |
| Zitting cisticola | Wetland | Red-backed shrike | Farmland |
| Night heron | Wetland | Melodious warbler | Woodland |
| Little bittern | Wetland | Short-toed treecreeper | Woodland |
| Purple heron | Wetland | | |

UK will become less suitable. In the case of **purple sandpiper**, **whimbrel**, **dotterel**, **common scoter**, **capercaillie** (see page 22), **Arctic skua** and **Slavonian grebe**, the effect is likely to be more detrimental as their UK populations are already in decline.

Species thought to have a high likelihood of colonising the UK include a number that have bred here previously. The **red-backed shrike**, once widespread over much of England and Wales, declined steadily from the middle of the 19th century onwards until the last regularly-breeding pair disappeared from Santon Downham, Norfolk, in 1989. Since that time breeding has been sporadic. It appeared that colonisation of the Scottish Highlands might be ongoing, but this faltered as with the **wryneck**, now extinct as a breeding species in the UK (see *SUKB* 2016).

**Red-backed shrikes** are thought to have been lost from the UK as a result of habitat loss and a decline in the availability of their large invertebrate prey due to agricultural change. But recent increases on the near-continent, coupled with a number of breeding attempts in southern England, raise the intriguing possibility that it might make a comeback, although how extensive that could be remains to be seen.

It is notable that many of the species which have recently colonised the UK, or which appear to be on the verge of doing so, are associated with wetlands, and that most species have first become established in protected areas.

Of those species considered likely colonists, a number are already at least occasional breeders. This year's data are still coming in, but already suggest that 2017 was an amazing year:

- **Night herons** were recorded breeding for the first time in the UK;
- **Cattle egrets**, which had only previously bred in 2008 and possibly 2009, bred at a number of new sites;
- **Black-winged stilts** had by far their most successful breeding season in the UK (six pairs fledging 13 young – more than the total number of young fledged from all 22 nesting attempts in the UK between 1983 and 2016). More individuals disperse into north-west Europe following dry winters in south-west Europe, and such conditions are expected to become more frequent and severe;
- **Spoonbills** bred at two new sites;
- The number of **great white egrets** breeding increased to 11–12 pairs, including at a new site in Norfolk;
- **Little bitterns** returned to Avalon Marshes in the Somerset Levels for the ninth year in a row.

In addition, in recent years **purple herons** have bred in Kent, a pair of **glossy ibises** have built a nest in Lincolnshire, and male white-spotted **bluethroats** have held territory.

Other potential colonists – **zitting cisticolas** and **short-toed eagles** remain great rarities in the UK – as does the **short-toed treecreeper**, although they are resident on the Channel Islands.

Of course, changes in our climate will influence many more of the species listed on page 18. A considerable list of southerly distributed species in the UK, some of them relatively recent colonists, have shown substantial increases in recent years, including **garganeys**, **quails**, **little egrets** (first bred in the UK in 1996), **honey buzzards**, **hobbies**, **little ringed plovers**, **Mediterranean gulls** (1968), **firecrests** (1962), **bearded tits**, **woodlarks**, **Cetti's warblers** (1973).

For some, these increases may have been helped by climate change, but for others the principal causes may be different, such as the focused conservation action aimed at saving the **cirl bunting**, which was described in *SUKB 2016*.

**Further reading:**

Ausden *et al.* 2015a. Climate change and Britain's birdlife: what might we expect? *British Wildlife* **26**(3): 161–174.

Hiley JR *et al.* (2014) Introduced and natural colonists show contrasting patterns of protected area association in UK wetlands. *Diversity and Distributions* **20**(8): 943–951.

# Recent surveys

## National capercaillie survey 2015-16

The **capercaillie** is a spectacular, large woodland grouse of old world boreal and temperate forests. But across much of its fragmented European range, populations are declining. In Scotland, its population has decreased substantially in numbers and range since the mid-1970s. Poor breeding success and increased mortality of adults, due to collisions with deer fences, have contributed to this decline.

The fifth national survey was undertaken during the winter of 2015–16, by the RSPB and SNH. **Capercaillie** are surveyed in winter, when the birds feed in the tree canopy and are more easily detected by observers, and disturbance to sensitive breeding birds can be avoided. Nearly 750 2km long triangular line transects were surveyed throughout the species' known range between November 2015 and March 2016.

The **capercaillie** population was estimated as 1,114 individuals (95% confidence limits: 805–1,505) compared with 1,285 individuals (95% CL: 822–1,882) in winter 2009-10. This represents a non-significant 13% decline, but a significant decline of 43% since the 2003–04 survey estimate of 1,980 individuals (95% CL: 1,284–2,758).

Over the longer term, it appears the population has been fluctuating between 1,000 and 2,000 birds since the first national survey in 1992–94, and is now very much at the lower end of this range. Conservation measures to reduce fence collisions have been undertaken in established woodland, but fences remain an issue in areas of new forest planting. However, increasing breeding success has proved much more difficult.

Over the last decade, wetter June weather has become more frequent, in line with expected climate change. Breeding success is known to be adversely affected by high rainfall in June when the chicks hatch, and by delayed warming in spring. Understanding how rainfall affects breeding success, and how patterns of rainfall might change in the future will be important in assessing the vulnerability of the population to climate change and the relative importance of other drivers.

Even when weather conditions are suitable, predation can still be a problem, probably exacerbated by the small size and fragmented nature of forests in much of their Scottish range, which provide easier access for predators. In addition, human disturbance can cause capercaillie to avoid otherwise suitable habitat, which may limit the potential for population expansion.

The concerted conservation action, by private landowners, NGOs and statutory and government agencies, of the last two decades appears to have halted or slowed the decline, but these latest results highlight that the population remains at a critically low level.

Dave Braddock (rspb-images.com)

**The capercaillie population is estimated at 1,114 birds.**

Andy Hay (rspb-images.com)

**The hen harrier population declined by 27% over the last 12 years.**

## National hen harrier survey 2016

The fifth UK and Isle of Man **hen harrier** survey was conducted in 2016, with the number of territorial pairs estimated at 575 (95% CL, 478–695): a non-significant 13% decline since the previous survey in 2010. Comparison with the estimate from the 2004 survey, demonstrates a significant decline of 27% over the past 12 years.

In Scotland, the population was estimated at 460 territorial pairs (95% CL, 359–573), this being 80% of all UK and Isle of Man pairs in 2016. The majority of these were found in the west, while Orkney and the Hebrides were the only areas of the country to show a slight increase in the number of pairs since 2010.

The survey also revealed that the **hen harrier** remains on the brink of extinction as a breeding species in England, as the population fell from 12 pairs in 2010 to just four pairs in 2016.

**Hen harriers** have been slowly recovering in Wales since re-colonising in the late 1950s, but the latest figures show that the number of pairs has fallen by more than a third over the past six years, from 57 to 35. With 46 pairs in 2016, Northern Ireland also experienced a decline in pairs after the 59 recorded in the previous survey. On the Isle of Man, **hen harrier** numbers remained stable, with 30 pairs recorded in 2016, up one on the 2010 totals.

The population changes detected since the last survey are likely to be caused by a combination of factors, varying from region to region. It is known that the main factor limiting the UK **hen harrier** population is the illegal killing of birds associated with driven grouse moor management in northern England and parts of mainland Scotland. In Northern Ireland, damage to nests and habitat by wildfires has been a significant recent issue. Other pressures such as cold and wet weather conditions over a number of breeding seasons, changes in habitat management and low prey abundance may all have had an impact on numbers throughout the UK.

Survey coverage was much greater than the previous surveys across all regions, carried out by a partnership involving the RSPB, Natural England, Natural Resources Wales, Scottish Natural Heritage, Scottish Raptor Study Group, Northern England Raptor Forum, Northern Ireland Raptor Study Group and Manx BirdLife.

House martin by David Tipling (rspb-images.com)

## House martin survey

A survey of **house martins** was undertaken across the UK in 2015. Organised by the BTO, one of the main objectives of this volunteer-based survey was to estimate the total number of breeding **house martins**, as well as to collect information on variation in their densities in different landscapes, and on the structures on which they build their nests. The survey was based on 1-km squares and used a stratified random design (based on habitat and previous occupancy) .

In total, 2,902 squares with potential habitat (buildings or other structures, including cliffs, on which nests could be built) were surveyed by more than 2,100 volunteers. Squares were surveyed one to three times over the season from mid-May to the end of July. Each square was searched thoroughly for **house martin** colonies (varying from none to more than 60), and the number of occupied nests per colony was recorded (varying from one to dozens). Additional information, such as building type, and the aspect and surface of where nests were built was collected.

The provisional UK population estimate, based on the number of active nests (assumed to reflect the number of breeding pairs), is now ca 650,000 to 850,000 pairs of which roughly 500,000 are estimated to be in England, 150,000 in Scotland, 70,000 in Wales and 30,000 in Northern Ireland. As might be expected, the vast majority of colonies were located on houses, with relatively few located on barns, municipal buildings, factories or churches, and very few at all on cliffs or bridges. Further work is underway to explore country and regional differences in colony size and use of buildings.

## Breeding Waders of English Upland Farmland

In 2016, a survey of breeding wader populations of "in-bye" farmland (farmland below and within 1 km of the moorland line) in England was conducted as part of broader investigations into the significance of this habitat and the impact of agri-environment schemes (AES). Coordinated by the BTO and RSPB, volunteers and professionals surveyed 522 randomly-selected tetrads containing in-bye farmland, recording numbers of key wader species by field. In-bye areas were found to support 48–67% of the English populations of **curlews**, **lapwings** and **snipe**, and lower percentages of more coastally-distributed waders (28% of **oystercatchers** and 14% of **redshanks**). Although not found breeding on in-bye land in significant numbers, **golden plovers** were frequently recorded foraging there.

Analyses of these and historical data, such as from recent Bird Atlases and the Breeding Bird Survey, showed both positive and negative associations with AES. AES management options for grazing and habitat restoration were positively associated with waders' numbers, particularly for **curlews**. However, Environmentally-Sensitive Area (ESA) management was negatively associated with **curlew** abundance.

These results are correlative and could therefore reflect, respectively, targeting of AES options to areas with high wader densities, or delineation of ESAs associated with areas with declining waders. This study demonstrates the importance of in-bye land to inland breeding waders, and that conservation action via Environmental Stewardship and Countryside Stewardship may be beneficial.

**In-bye farmland is important breeding habitat for lapwings.**

Andy Hay (rspb-images.com)



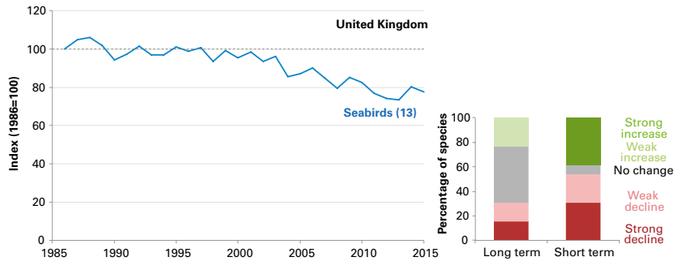
# Breeding seabirds in the UK

Since 1986, breeding seabird colonies around the UK and Ireland have been monitored annually by the Seabird Monitoring Programme (SMP), co-ordinated by JNCC, with surveys undertaken by partner organisations and dedicated volunteers.

The SMP receives data on seabird breeding abundance and productivity from up to 500 different seabird colonies each year. Trends from these data allow us to assess the state of many of our breeding seabird populations, help us to identify the drivers of change, and help us to make inferences about the health of the wider marine environment. SMP data are used for several regional, national and international agreements, as well as providing the broad-scale measurement of the state of the UK's breeding seabird populations.

You can see the full SMP report at **jncc.defra.gov.uk/page-3201**

## UK seabird indicator




The figure above shows the unsmoothed trend (solid line). No smoothed trend is available for seabirds, as individual species' population trends are analysed using an imputation procedure that does not include smoothing.

Please see the notes on page 9 for a full explanation of the bar chart (above). As data are based on a mixture of full counts and sample sites, standard bootstrapping methods used for other indicators cannot be applied and the trend is presented without confidence intervals. For details of species' trends in each indicator, download the report: **https://www.gov.uk/government/statistical-data-sets/env07-wild-bird-populations-in-the-uk**

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

The UK seabird indicator stands at 22% below the 1986 baseline, with most of this decline occurring since the mid-2000s. Three species – **Arctic terns** (mainly in England), **guillemots** and **razorbills** – have increased since the beginning of the index and two species have declined strongly (**kittiwakes** and **Arctic skuas**). The remaining eight have shown no change or a weak decline.

**Populations of razorbills have increased.**

Andy Hay (rspb-images.com)

## Seabirds and climate change

Climate change is considered to be one of the primary causes of seabird declines, through indirect effects via changes in prey availability and abundance, and through direct effects such as increased mortality from the increasing frequency and intensity of extreme weather events. These processes will interact with current drivers such as unsustainable fisheries, pollutants, marine renewables and disease. Overall negative relationships between temperature and the productivity of seabirds has been shown for **kittiwakes**, **fulmars** and **puffins**, as well as **common**, **Arctic** and **little terns**.

Habitat suitability around the UK for seabirds is projected to shift northward over the next century and birds' distributions may shift with changing conditions. Declines in European ranges are also predicted – with **Leach's storm petrels** and **Arctic skuas** projected to come close to or reach UK extinction by 2100.

## A cause for concern?

SMP data have shown that UK **shag** and **kittiwake** breeding abundance declined by approximately 34% and 44%, respectively, between 2000 and 2015. Both species have breeding season diets heavily reliant on sandeels, such that declines in sandeel abundance are likely to be affecting productivity (see **kittiwake** case study, page 34).

Between 2000 and 2015, SMP data indicated that the UK **Arctic skua** breeding population declined by over 60%, more than any other seabird in the UK. This decline is linked to competition for nesting territories with, and predation of adults and chicks by, **great skuas**, whose population increased markedly between the 1985–88 and 1998–2002 seabird censuses. In addition, the climate-related reduction in the availability of prey species such as sandeels, is also likely to be a factor.

**Arctic skuas** rely on stealing fish caught by other seabirds, especially from **kittiwakes**, **Arctic terns** and **puffins**. Declines in the abundance and the chick provisioning rates of these host species is likely to have reduced **Arctic skua** feeding opportunities. In periods when **great skuas'** normal food sources are particularly limited, these birds can switch to predating other seabirds. Considering **kittiwakes** and **Arctic skuas** are prey for **great skuas**, increased predation may also be contributing to declines in their populations.

Changes in weather patterns may also be affecting **shags**, whose plumage is only partially waterproof, perhaps making them more susceptible to mortality during prolonged periods of wet and windy weather. Stormy weather may also lead to **shag** starvation through reduced foraging success, probably due to increased water turbidity. Such weather patterns are predicted to increase with climate change. Severe events, in the winters of 1993/94, 2004/05 and 2012/13 caused large numbers of birds to die (known as a "wreck") and affected the population. considerably. Breeding numbers were not fully recovered following the wreck of 1993/94 when the storms of 2004/05 hit and no recovery was apparent before 2012/13. The population was at its lowest yet recorded in 2013 (52% below the baseline), and by 2015 had only improved marginally (see table right).

Andy Hay (rspb-images.com)

**Stormy weather affects shag survival.**





## Trends in UK breeding seabirds

The table shows the differing fortunes of 16 seabird species monitored by the SMP over the short- and long-term. Results are only given for species for which trends are considered to be robust. Data are not available to produce robust trends for Red-listed **puffins** and **herring gulls**.

[1] Trend derived from census interpolations and extrapolations.
[2] Due to low confidence in the data since the last census, this value is not presented.

| Species | 1986–2015 trend % | 2000–2015 trend % | BoCC4 |
|---|---|---|---|
| Fulmar | -33 | -31 | |
| Gannet [1] | 86 | 34 | |
| Cormorant | 4 | -8 | |
| Shag | -45 | -34 | |
| Arctic skua | -76 | -64 | |
| Great skua [2] | 53 | 18 | |
| Kittiwake | -60 | -44 | |
| Black-headed gull | 24 | 38 | |
| Great black-backed gull | -1 | -11 | |
| Little tern | -34 | -18 | |
| Sandwich tern | 5 | 13 | |
| Common tern | -17 | -10 | |
| Roseate tern | -52 | 229 | |
| Arctic tern | 19 | 17 | |
| Guillemot | 37 | 5 | |
| Razorbill | 87 | 32 | |

## Rise of the generalists?

Although populations of several UK seabird species are in decline, several species show long-term increases. **Great skuas**, **gannets**, **guillemots** and **black-headed gulls** are four of eight species that showed an increase in their breeding abundance between 2000 and 2015. Flexibility in food sources, foraging strategy and even changing breeding phenology may be allowing these species to thrive when others are failing.

A trait that many of these species share is a lack of specialisation in their preferred food types. When sandeel abundance is low, **guillemots** can switch from their preferred sandeel diet to sprat, young gadids (species in the cod family), pipefish or even squid when feeding chicks. Both **black-headed gulls** and **gannets** have a varied diet, with the former feeding on multiple species of crustaceans and molluscs, and the latter on varying species and sizes of fish. As these species are increasing when more specialised feeders are in decline, it appears that being flexible with food may mitigate the effects of climate change.

## A complex picture

**Fulmars** appear to be an exception to this apparent pattern. They have long foraging ranges and are not particularly specialised in their feeding habits. Yet this species has seen a 33% decline in its breeding numbers since 1986.

Although correlations have been observed between North Atlantic climate variation and both **fulmar** adult survival and productivity, the specific driver for the decline is unclear.

It should also be noted that species which are exhibiting rapid population increases may be coming back from extremely low numbers. For example, **roseate terns** increased 229% between 2000 and 2015, but this was calculated from 56 apparently occupied nests in the last census (Seabird 2000) to 113 in 2015, and numbers are still well below the 950 pairs observed between 1969 and 1970.

# Climate change and birds

## How has the UK's climate changed?

**8 of the 10 warmest years on record occurred since 1990**

**There have been slight increases in rainfall across the UK, mostly during winter – with heavy rainfall events making a growing contribution.**

**Sea surface temperatures have increased and nine of the 10 warmest years for UK seas have occurred since 1989.**

(Kendon *et al.* 2015, Kendon *et al.* 2017, Humphrey and Murphy 2017)

Average **UK** temperatures have **increased** by nearly **1 °C** since the **1980s**

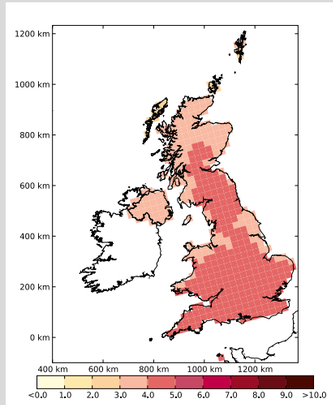
**Scotland** was on average **11% wetter** between **2007-2016** than **1961-1990**

In the **20th century**, **UK sea levels rose** by **14cm** and the rate is **increasing**

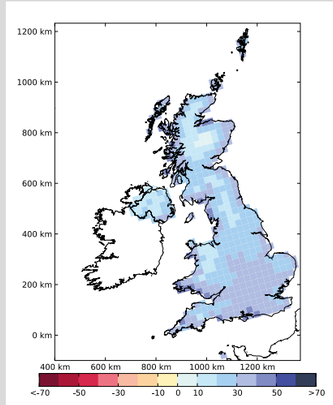
## Trends are projected to continue

Current projections are for increases in temperature, wetter winters, drier summers and an increase in the frequency and intensity of extreme weather events (including heatwaves, droughts, heavy rain and floods).

Overall reductions in water availability, particularly in the south-east, are expected to be exacerbated by increased demand for water for agriculture, industry and services (Environment Agency 2011; Rance *et al.* 2012).




Change in mean temperature (deg C)




Change in precipitation (%)

**By 2050:** Mean summer temperature projected to increase by up to 5°C in many parts of the UK by 2050.

Mean winter rainfall projected to increase by between around 10% and 50%, while summers will be drier.

Maps (above) show UK Climate Projection ranges of change in average summer temperature (left) and average winter rainfall (right) by 2050 relative to 1961–1990 under a medium emissions scenario. These maps project change that is very unlikely to be exceeded (90% probability levels). It should be noted that projections can be very different for other time periods and other emissions scenarios.
(© UK Climate Projections 2009)





## Observed impacts of climate change on birds

Climate change is already affecting much of our wildlife. Trends in temperature and rainfall over the past 30 years have been shown to affect the distribution, abundance and timing of natural events.

Changes in survival and breeding success lead to changes in community processes and population changes for a wide range of taxonomic groups (Morecroft *et al.* 2009, Morecroft & Speakman 2015, Thackeray *et al.* 2010, Walther *et al.* 2010).

Since the early 1990s, birds in the UK, and Europe as a whole, have shown changes in numbers and distribution consistent with a warming climate.

**Distributional changes:**

- Species' distributions are changing, predominantly moving northwards, but there is also some evidence for shifts to higher elevations, as has been seen with other taxa.
- For a number of resident species, expansion at the northern edges of their ranges, where suitability is increasing, has been more rapid than the rate of loss at the southern range margins, where suitability is declining, resulting in overall expansion of species' ranges of >1km per year (Massimino *et al.* 2015).
- Shifts averaging about 13km or more to the north and west have been detected between bird atlases (1988-91 and 2007-11) for a number of southerly-distributed species, such as **goldfinches**, **chiffchaffs** and **nuthatches** (Gillings *et al.* 2015) - see maps below. Other drivers such as food and habitat availability may play a part in these shifts, as well as climate warming.
- Currently there is evidence that, across Europe, shifts in species' distributions are lagging behind the rate of warming, suggesting that birds may not be responding rapidly enough (Devictor *et al.* 2012), or, for example, that availability and distribution of suitable habitat and/or changes to species interactions could be restricting the ability of species to track suitable climate. However, to date, there is no evidence for such lags influencing population changes.

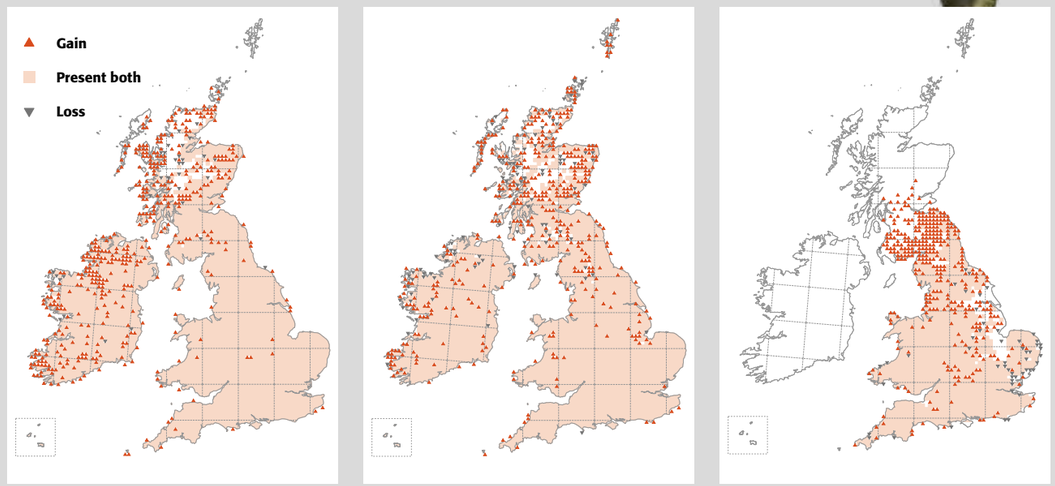
Goldfinch by John Bridges (rspb-images.com)

**Goldfinch**

### Goldfinch
Breeding distribution change 1988-91 to 2008-11

### Chiffchaff
Breeding distribution change 1988-91 to 2008-11

### Nuthatch
Breeding distribution change 1988-91 to 2008-11



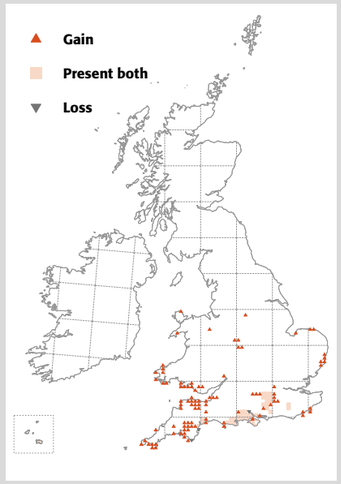

Maps reproduced from Bird Atlas 2007–11, a joint project between, BTO, BirdWatch Ireland and the Scottish Ornithologists' Club. Map reproduced with permission from the British Trust for Ornithology.

Ben Hall (rspb-images.com)

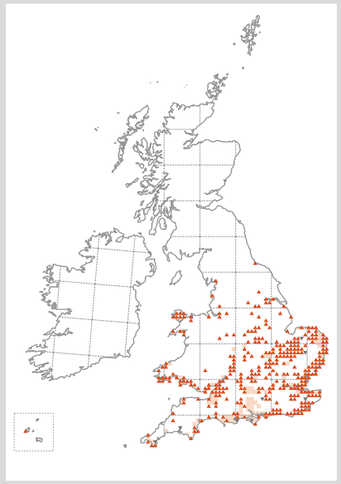
**Dartford warbler numbers have risen while the UK's climate has warmed.**

As well as shifts for common and widespread species, there are a number of previously scarce species, such as **Cetti's warbler** and **Dartford warbler** (see case study on page 40), that have recently expanded their ranges considerably. **Cetti's warbler**, which bred initially in the south-east of the UK upon colonisation in the 1970s, now has the core of its distribution in the south-west. While it continues to be limited by cold winters (Robinson *et al.* 2007), most recently in 2009/10, it continues to increase in numbers and expand its range (Green 2017).

**Dartford warbler**
Breeding distribution change
1988-91 to 2008-11




**Cetti's warbler**
Breeding distribution change
1988-91 to 2008-11



### Wintering birds re-distributing

- A north-eastward shift in the range of some wintering waterbirds has also been reported in north-west Europe, including the UK, which is associated with a trend for milder winters (Lehikoinen *et al.* 2013, Austin & Rehfisch 2005).
- In severe cold winters like that in 2010/11, numbers of **bar-tailed godwits** were higher than in the mid-2000s, probably because they were escaping cold conditions in north-west Europe.

Between 1981 and 2000, wintering distributions of grey plovers and curlews in north-west Europe shifted nearly 120km north-east (Maclean 2008).

**Curlew**





### Population trends

There is now considerable evidence for changes in abundance and population trends of birds. The observed and predicted changes in climate suitability and recent species population trends have been shown to be correlated across continental Europe (Gregory *et al.* 2009; Stephens *et al.* 2016).

Many resident species, such as **wren**, **treecreeper**, **nuthatch**, **robin** and **dunnock**, have shown long-term increases in abundance, which have been linked to increases in winter and spring temperatures.

Populations of long-distance migrants (for example **ring ouzel**) may suffer negative consequences from warmer, drier conditions during the spring and summer potentially influencing food availability and abundance (Beale *et al.* 2006). Migratory populations are also sensitive to changes in weather conditions on their wintering grounds, where lower rainfall affects survival rates (Johnston *et al.* 2016).

Long-term changes in internationally important waterbird populations are also partly explained by climate change (Johnston *et al.* 2013). Improved survival as a result of milder winters has been reported for several species including **dunlins**, **redshanks** and **golden plovers**.

A number of breeding seabird species, eg **kittiwakes** and **shags,** show declines caused by declining productivity associated with warming seas and changes to food abundance and availability (see **kittiwake** case study on page 34).

### Community change

Collectively, these responses mean that birds in the countryside around us are changing in response to climate change. Southerly-distributed species, resident species and habitat generalists are increasing relative to northern or upland species, long-distance migrants and habitat specialists (Davey *et al.* 2012).

Across Europe, warm-associated species are becoming more common relative to cold-associated species (Devictor *et al.* 2012), and bird communities are becoming more similar to each other (Le Viol *et al.* 2012, Sullivan *et al.* 2016). For birds, the decline in cold-adapted, northern species is the key driver of change in community composition across England, contrasting with the situation for butterflies, where the change is being driven by an increase in southern, warm-adapted species (Oliver *et al.* 2017).

### Changes in timing

The spring arrival dates for 11 of 14 common migrants have got earlier and egg-laying dates have advanced with the result that **swallows**, for example, are arriving in the UK 15 days earlier and breeding 11 days earlier than they did in the 1960s (Newson *et al.* 2016).

However, timings vary annually in relation to spring temperatures and conditions on migration. **Blackcaps** and **chiffchaffs** bred significantly later in 2016 than they have in recent years, probably as a result of lower April temperatures (NRS report 2016).

Timing of departure has become slightly delayed in some species, including short distance/partial migrants, eg **blackcaps** and **chiffchaffs**, and long distance migrants, eg **garden warblers**.

As a result of earlier arrival and later departure, migratory species are staying longer in the UK. For example **sand martins** and **whitethroats**, now spend around two weeks longer in the UK than in the 1960s, and **garden warblers** four weeks longer.

Species that have extended their stay in the UK show more positive trends in abundance over the period studied (1960s–2010), compared to species that had not altered their timing of migration, for example **cuckoos** and **turtle doves** (Newson *et al.* 2016).

However, timings events vary between taxonomic groups. Across a wide range of species of plants and insects, timing has advanced on average by about four days for a 1°C increase in temperature, compared to birds which have advanced by an average of two days. This presents a potential problem of mismatch between peak prey availability and birds' peak prey requirements (Thackeray *et al.* 2016).

Ernie Janes (rspb-images.com)

**Swallow**

# Mechanisms

Identifying whether observed changes are caused by climate change remains a challenge, and the subject of a range of studies, analyses and modelling approaches.

Conversely, there remains much to understand about the importance of extreme weather events in driving population change, and the impact of increasing severity and frequency of such events on species survival and breeding success.

The extent to which a species can respond to climate change is affected by various factors and the interactions between them, including habitat availability, habitat quality and the species' physiological and dispersal ability (Thomas *et al.* 2011, Eglington and Pearce-Higgins 2012, Oliver *et al.* 2017).

Here we give just a few examples of research and monitoring that demonstrates some of the best-known mechanisms.

**Survival rates:**

- Fluctuations in population trends of one of our largest breeding birds, the **grey heron** (1930-2017) and one of our smallest, the **wren** (1965-2016), are closely related to annual variation in mean winter temperature (Pearce-Higgins & Green 2014). Long periods of cold days with continuous frost reduce **wren** survival rates – which can be halved by more than 10 consecutive days of frost (Robinson *et al.* 2007). Both species have shown increasing trends due to less severe winters.

**Breeding success**

- Warmer temperatures during the breeding season have been shown to have a positive effect on breeding success for a range of species. For example, birds that feed insects to their young, such as **great tits** and **chaffinches**, have improved productivity in warm, dry springs, probably mediated by increased prey abundance and good foraging conditions. Further evidence comes from numerous studies which show positive effects of temperature on chick growth and productivity in waders and other ground nesting species with mobile young (eg **golden plover**, **common sandpiper** and **corncrake**) (Pearce-Higgins and Green 2014).
- Changes to patterns of rainfall and temperature can have diverse effects on a population's breeding success: for example, **Slavonian grebes** in Scotland had higher breeding success when temperatures were higher during chick rearing, but periods of particularly heavy rainfall during the breeding season led to smaller populations (Ewing *et al.* 2013). The breeding success of some raptors and grouse species can also be very sensitive to rainfall during chick rearing (Pearce-Higgins & Green 2014).

**Species interactions**

- Shifts in distribution, geographic variation in population trends, and changes in timing all lead to changes in communities of species. This can affect species interactions (such as predator-prey relationships and competition) which in turn can drive further population change (Ockendon 2014).
- Differences in the rates of change in the timings of life history events leads to the potential for mismatch in the timing between peak food demands of breeding birds and peak food availability, leading to a potential reduction in breeding success and subsequent population decline, for example **pied flycatcher** in the Netherlands (Both *et al.* 2009).
- Mismatch has been studied in detail for only a few species, and has not been directly linked to reductions in breeding success or large-scale population decline in the UK. Instead, changes in the abundance of insect prey populations may be more important (see **golden plover** case study on page 38).

Grey heron by Mike Lane (rspb-images.com)

**Grey heron**





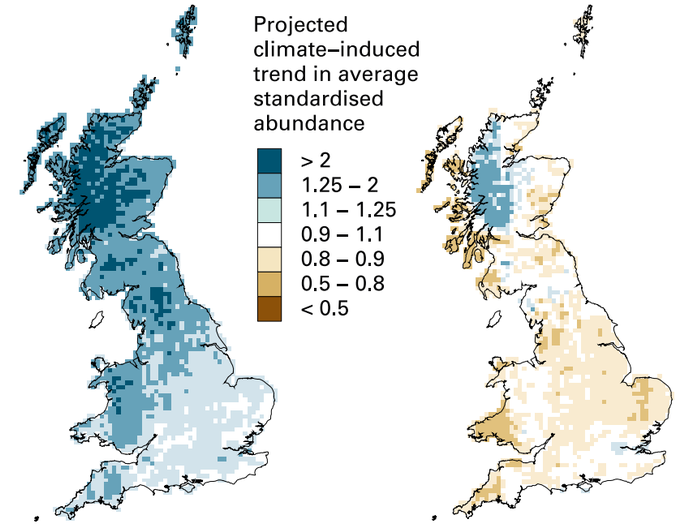
# Projected future impacts of climate change

With around 1°C of global temperature rise recorded already, climate change has been assessed as the second-largest driver in the UK of observed changes in wildlife populations. Only intensification of agriculture has been a greater driver of declines (Burns *et al.* 2016). Because of this, some species, such as the **turtle dove**, which are predicted to increase with climate change, have not done so due to non-climate related pressures.

Current and historic distributions of species can be used to identify the climate conditions suitable for them. Climate-envelope models constructed from these data can then be used to see where species could live based where those climate conditions are projected to be in the future. Using these methods, a climatic atlas of Europe's breeding birds was published (Huntley *et al.* 2007). There is increasing evidence linking projections to observed bird population changes (Stephens *et al.* 2016, Green *et al.* 2008). By linking the projections with habitat availability and non-climate pressures which are likely to interact to constrain opportunities or exacerbate risk, tools have been developed to assess the overall level of risk or opportunity posed by climate change for species (Thomas *et al.* 2011, Wheatley *et al.* 2017).

A larger number of species are predicted to have opportunities for range expansion in the UK, compared to those at risk of contraction (Pearce-Higgins *et al.* 2017). Maps (above) show how numbers are projected to change for Green-listed species compared for those Red- and Amber-listed (Massimino *et al.* 2017).

There are clear reasons for this. There are more southern species with potential for northward expansion in the UK than there are northern species predicted to contract, and observations suggest this is already happening (Massimino *et al.* 2015). However, this apparently favourable assessment for the UK needs to be set in the context of declines at the other end of species' ranges in Europe, as well as the increased vulnerability of a number of species of high conservation concern.



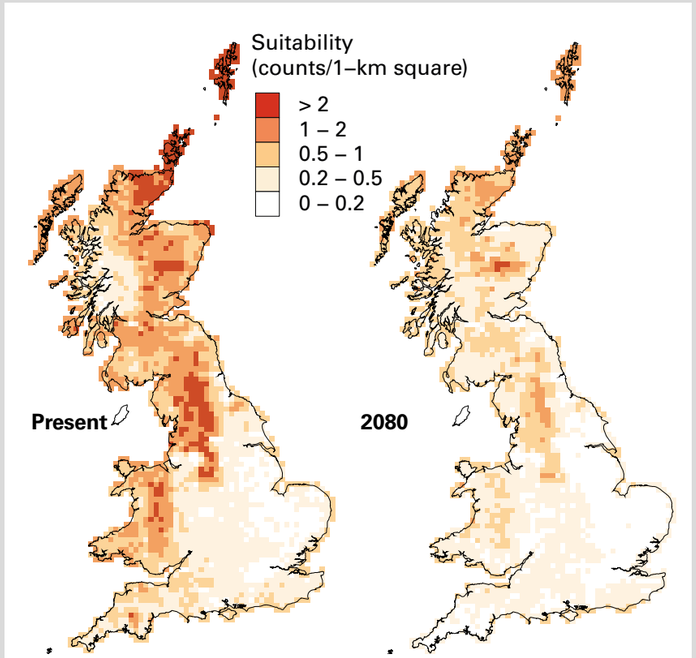

**Green-listed species (left) are projected to increase across the UK particularly in the north. Conservation status is projected to improve for 28 species. Red- and Amber-listed species (right) are projected to have widespread declines except in north and west mainland Scotland (Massimino *et al.* 2017)**

Redshank by Ray Kennedy (rspb-images.com)

## Vulnerabilities and constraints with climate change

There are many obstacles to range expansion and colonisation. In the main part, this is due to limited habitat availability and other non climate-related factors. For example, rising sea levels, combined with an expected increase in the severity of storms, is expected to increase coastal flooding and thus loss of intertidal habitats, as well as coastal freshwater and brackish wetlands.

Northern and upland species are predicted to be more vulnerable, with northward and uphill range contraction (Green *et al.* 2008, Pearce-Higgins 2010). Analyses aiming to determine the true role of climate change in driving current observed declines in these species are still ongoing. Nevertheless, species such as **dotterels**, **purple sandpipers** and **whimbrels** breeding in the UK at the southern edge of their global range are considered to have an inherently higher risk of climate-related extinction as a breeding species in this country (Ausden *et al.* 2015a). Other climate-vulnerable upland species in the UK include **golden plovers** (see case study, page 38) and **curlews** (see maps above) (Massimino *et al.* 2017).




**Abundance of curlews is projected to drop 50% (1997-2080) under a medium climate change scenario.**

Ed Marshall (rspb-images.com)

### Kittiwake *case study*

The UK's **kittiwake** population has declined by approximately 60% since 1986 as a result of both falling breeding success and adult survival. North Sea **kittiwakes** rely on sandeels during the breeding season and could be affected in two main ways. Firstly, through sandeel fisheries reducing food availability, but most importantly through changing ocean conditions because of climate change (Frederiksen *et al.* 2004, 2013).

Rising sea surface temperature has changed the plankton community on which sandeels rely. In addition, rising temperature is also changing the process of stratification – the relationship between sea temperature and salinity, which creates density differences between deep and shallow waters. Earlier or stronger stratification can ultimately reduce food availability for **kittiwakes** (Scott *et al.* 2006) and the species' breeding success has been found to be lower in areas where this has occurred. Based on these relationships, projections for the late 21st century suggest that the breeding success of the 11 northern UK colonies studied could fall by up to 43% (Carroll *et al.* 2015b).





## CONSERVATION ACTIONS – Building ecological resilience to the impacts of climate change

Climate change adaptation is an increasingly important priority for nature conservation and will involve a range of approaches appropriate to different circumstances.

The following four adaptation principles were developed and agreed by experts as the overall direction in the National Adaptation Programme (HM Government, 2013, due to be updated in 2018): **gov.uk/government/publications/adapting-to-climate-change-national-adaptation-programme**

| | |
|---|---|
| *Building resilience of wildlife, habitats and ecosystems to climate change* | • Work to make wildlife resilient to impacts of climate change seeks to build strong populations with dispersing individuals able to colonise new areas (Lawton *et al.* 2010, Newson *et al.* 2014, Oliver *et al.* 2017).<br>• New and revised conservation actions needed for climate change contribute to achieving current conservation targets and priorities.<br>• The network of protected sites remains vital for protecting priority species because while sites may lose some species, they will also gain others (Johnston *et al.* 2013). |
| *Preparing for and accommodating inevitable change* | • Ongoing change across the UK is inevitable.<br>• Some species will occur in different places, communities will change and some habitats will change regardless of changes to management.<br>• Conservation objectives and targets need to be realistic, flexible and yet robust to aim for the best results in changing circumstances.<br>• Accommodating change involves facilitating movement of species. This applies at all scales – local, regional and national – and in many cases involves increasing connectivity across the countryside. Translocation of species should be considered on a case-by-case basis where species are unable to relocate naturally to areas with suitable climate and habitat. |
| *Valuing the wider adaptation benefits the natural environment can deliver* | • Climate change has impacts on people as well as wildlife and the way society adapts to the threats it faces may have positive or negative impacts for birds and other species.<br>• One of the clearest examples is where hard sea defences designed to reduce coastal flooding may prevent natural readjustment of the shoreline and lead to a loss of coastal habitats. By allowing natural processes to create new habitats through managed realignment, we can have more natural solutions to flooding which will have multiple benefits: reducing the risks of flooding to people, creating extensive wetlands, as well as carbon capture in intertidal habitats created.<br>• Other examples include upland catchment management for wildlife and water, trees in shaded open spaces for people in urban environments, and re-naturalising river systems to reduce flow rates and retain flood waters. |
| *Improving the evidence base* | • Much remains unknown about the impacts of climate change and the effectiveness of different adaptation measures.<br>• Monitoring to identify observed impacts, and research to assess the magnitude and timing of possible future impacts, require long-term robust datasets and the co-operation of a range of scientists, government, agencies and NGOs. |

# How can we help species adapt to climate change?

Effective adaptation management requires a solid evidence base and experience to recognise and respond to the vulnerabilities and risks that climate change brings, as well as making the most of any opportunities. By observing ongoing changes we can adapt management of sites and habitats to facilitate species responses to climate change.

Across the UK, nature reserve and other land managers are developing a range of actions to adapt to climate change, from coastal realignment to increasing microclimate heterogeneity. Natural England and the RSPB have published an online Climate Change Adaptation Manual, which brings together the best available science and practical experience to support decision making. Below are some examples of actions to help species adapt to climate change. **publications.naturalengland.org.uk/publication/5629923804839936?category=10003**

Andy Hay (rspb-images.com)

- **Dartford warblers** and **nightjars** (left) are characteristic species of lowland heathlands. Restoration and re-creation of these scarce and fragmented habitats to the north of the core area for these species will aid northward expansion. Heathland restoration involves optimising the level of grazing, cutting and/or burning to maintain structure and condition as well as managing the fire risk, which is projected to increase with warming temperatures and reduced rainfall.

Ben Andrew (rspb-images.com)

- **Little terns** (left) and **common terns** nesting on low-lying coastal islands require sites to be raised using shingle as the sea level rises and sites become more vulnerable to storms. In managed realignment areas new nesting islands can be created. Island nesting sites are important because in many nesting areas, breeding success is reduced by high levels of disturbance and impacts of ground predators.

Chris Knights (rspb-images.com)

- Lowland breeding waders such as **lapwings**, **redshanks** and **black-tailed godwits** (left) require shallow pools and moist soil for foraging. Current measures to increase water availability in the face of lower rainfall and higher temperatures include storing water for the breeding season, and maintaining wet features by digging shallow channels. Conversely, for **black-tailed godwits**, existing breeding habitat in the UK is only found in wet meadows used for floodwater storage; in years with high levels of rain they have lower breeding success. To safeguard the population from increased flood risk, additional unflooded grassland is being created for when adjacent washlands are flooded.

Richard Brooks (rspb-images.com)

- A high proportion of potential colonist species (see page 17) are waterbirds which require very large wetlands. The re-establishment of breeding by **spoonbills** (left), **great white egrets** and **little bitterns** in the UK has all occurred at large wetland expanses. However, there are very few large wetlands capable of supporting large breeding colonies of such waterbirds (Ausden *et al.* 2014a). Wetland habitat creation to benefit current species as well as potential colonists would therefore be best focused on providing a small number of very large wetland complexes in the vicinity of existing habitats.





Andy Hay (rspb-images.com)

## Breeding golden plover *Case study*

**What has happened?**
**Golden plovers** breeding in the UK uplands are among the most southerly populations in their global range. **Golden plovers** rely on cranefly larvae (also known as leatherjackets) for food, which are highly sensitive to drought, and high temperatures in August reduce the abundance of craneflies the following year. This means that climate change could limit the birds' food supply, reducing chick survival and overall breeding success (Pearce-Higgins *et al.* 2010).

**What do we think will happen?**
Modelling suggests that the abundance and persistence of **golden plover** populations in the Peak District in northern England could decline as warmer, drier summers reduce cranefly abundances. Overall, **golden plovers** have been assessed as having a high risk of climate-related decline. This is despite projected improvements in winter survival for this species, because the reduction in productivity is likely to outweigh any improvements in survival (Carroll *et al.* 2015a).

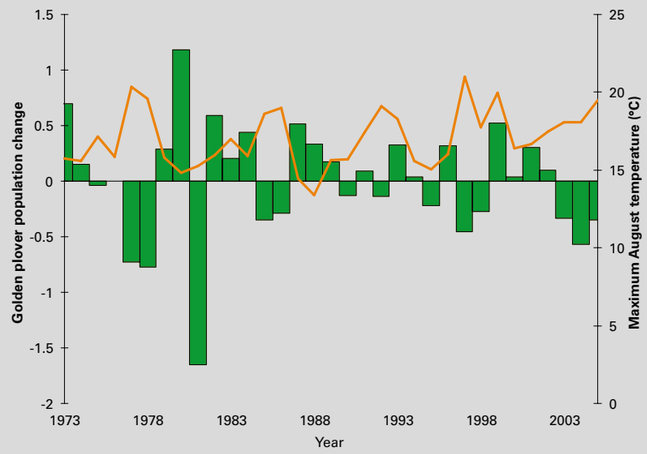
**What can we do to help?**
Management could increase resilience of these populations. Throughout the 20th century, many UK upland peatlands were drained to improve agriculture, but this exacerbates cranefly declines and has further impacts on ecosystem functioning.

Experimental examination of three drained peatlands has shown that blocking drains as part of restoration programmes leads to wetter peat and higher cranefly abundances (Carroll *et al.* 2011).

Blocking drainage ditches therefore provides more food for **golden plovers** in drained peatlands, aiding populations in a climate changing to drier summers. Other ecosystem services benefits are also achieved by rewetting peatlands, notably improved carbon storage, improved water quality and reduced flood risk (Wilson *et al.* 2011).

Such benefits are already being realised through landscape scale restoration projects, such as the Sustainable Catchment Management Programme (SCaMP – a partnership between United Utilities, the RSPB, local farmers and a wide range of other stakeholders). Other non-climate change-related management actions which help **golden plovers** include legal control of generalist predators, removal of conifer plantations in inappropriate areas, re-profiling of forest edges around protected areas (Wilson *et al.* 2014) and provision of suitable feeding conditions through vegetation management (Pearce-Higgins *et al.* 2015b).

**Golden plover** populations could decline as warmer, drier summers affect cranefly populations.




**Annual fluctuations in the abundance of golden plovers at Snake Summit in the Peak District (bars) in relation to August temperature two years previously (line). Population declines were more likely to occur following hot years.**

# CONSERVATION ACTIONS – Building ecological resilience to the impacts of climate change

The UK's fauna is being augmented by species arriving from continental Europe and this will increase, as climate projections show greater future change in Europe than in the UK.

A number of species associated with wetlands have been assessed as having the potential to expand their ranges or establish, or re-establish, regular breeding populations here in the next few decades (see pages 17-21). While some of these species are recovering from past human-induced declines, climate change-driven range shifts must also be considered in establishing and managing the large areas of habitat that many of these species require (Ausden *et al.* 2014b).

To help new species of waterbirds colonise from Europe, large areas of new wetland, such as those created through management realignment, will be required. The largest coastal wetland to be constructed in the UK is the Wallasea Island Wild Coast project (Ausden *et al.* 2015b), pictured below.

The south-east of England, where most potential colonists will first arrive from the continent, is likely to experience greater warming, more reduced rainfall, and the greatest level of human pressure.

Future management of wetlands needs to take into account increased climate-related drying and increasing human demand for water in the region (Ausden *et al.* 2015a).

www.commissionair.co.uk

**Wallasea Island Wild Coast Project: a wetland designed to provide valuable habitat for wildlife, both now and under a range of future climate conditions.**





## Dartford warbler *Case study*

**What has happened?**
As a resident species, the **Dartford warbler** is vulnerable to severe winter weather. The population in the UK may have declined to a low of 11 pairs in 1963 following two very cold winters. A period of warming since then has seen the population increase, with more than 2,500 pairs in 2006 (Wotton *et al.* 2009). Expansion into patches of structurally suitable habitat (up to an altitude of 400m), more northerly areas and away from the core of the range, from Dorset and Hampshire to Derbyshire and Suffolk, is likely to have been facilitated by milder winter weather (Wotton *et al.* 2009, Bradbury *et al.* 2011). However, the species is still vulnerable to severe winter conditions, such as those experienced in 2009/10 and 2010/11 (Green 2017).

**What do we think will happen?**
The **Dartford warbler** population in the UK is projected to continue to increase. However, future climate-based projections for the European range indicate that by 2080, more than 60% of the current European range may no longer be suitable (Huntley *et al* 2007). There is evidence that this is happening already, with severe declines in Spain and France (Green 2017). For this reason, the species is classified as Near Threatened on the IUCN Global Red List. If the declines in southern Europe continue, the UK will become increasingly important for global conservation of this species.

**What can we do to help?**
UK sites are even more important for Dartford warblers at a European scale if a large proportion of the range becomes unsuitable. This demonstrates that setting local and regional conservation priorities needs to take into account the international context. Management, including enhancing and creating suitable lowland and upland heath, as well as controlling high levels of human disturbance on these sites, will be essential to facilitate ongoing population increase (Pearce-Higgins *et al.* 2015b).

**Importance of protected areas**
Protected areas have been key to the expansion of this species: 74% were in protected areas. Indeed, across seven species (two butterflies and five birds) included in a study of northward range expansion, protected areas were colonised four times more than expected given the available protected area coverage (Thomas *et al.* 2012).

Protected areas are going to be a vital part of responding to climate change, enabling conservation management as a priority. Connectivity between protected areas by increasing habitat availability in the wider countryside with be an important factor in facilitating movement of species under climate change.

Ben Hall (rspb-images.com)

The UK's population of **Dartford warblers** looks set to become increasingly important in a European context.

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Mallard by shutterstock.com

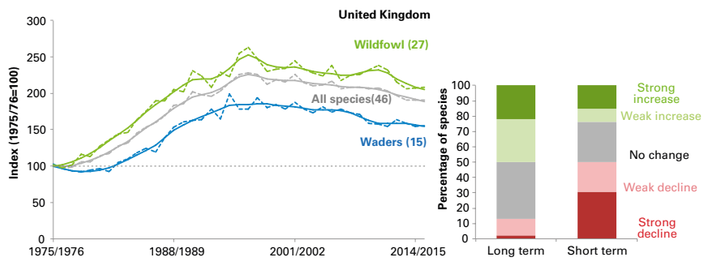
# Wintering waterbirds

The Wetland Bird Survey (WeBS), the Non-estuarine Waterbird Survey (NEWS) and Goose and Swan Monitoring Programme (GSMP) allow us to monitor populations of the waterbirds that visit UK wetlands in winter or during passage as they migrate along the East Atlantic Flyway. Our wetlands, and other habitats, are used by internationally important numbers of many waterbird species.

Research indicates that climate and habitat changes will affect the numbers of waterbirds using our wetlands. Therefore, the UK has a responsibility to care for these populations and the sites they use, and our monitoring programmes are the first step in fulfilling this duty.

## UK wintering waterbird indicator

The wintering waterbird indicator shows that, on average, populations rose steadily from the mid-1970s into the late 1990s. Following a period of stability, numbers then started to decrease – between 2009/10 and 2014/15 the smoothed index fell by 8%, with declines being particularly marked amongst wintering waders. This fall can – at least in part – be explained by a decreasing number of birds spending the winter in the UK. The trend towards milder winters on the continent means fewer birds have to move here in order to avoid cold weather. For more on trends for individual wintering waterbird species, see page 45.

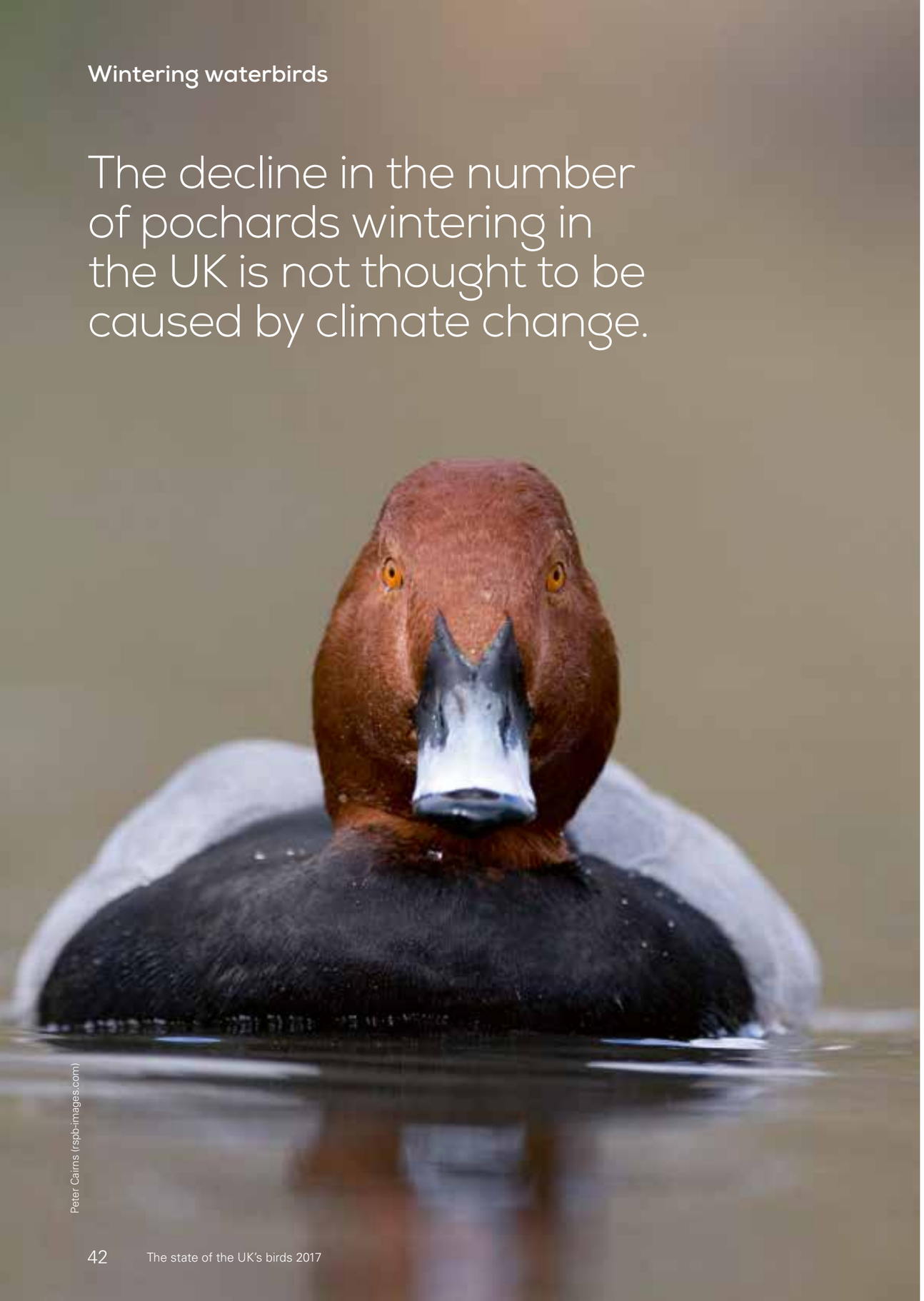



**Source:** BTO, DEFRA, JNCC, RSPB and WWT.

The figure shows the unsmoothed trend (dashed line) and smoothed trend (solid line). Data from surveys of wintering waterbirds are based on full counts on wetland and coastal sites of markedly varying size. This means that standard indicator bootstrapping methods cannot be applied and the trend is presented without confidence intervals. Please see the notes on page 9 for a full explanation of the bar chart (above).

For details of species' trends in each indicator, download the report: **https://www.gov.uk/government/statistical-data-sets/env07-wild-bird-populations-in-the-uk**

# The decline in the number of pochards wintering in the UK is not thought to be caused by climate change.



Peter Cairns (rspb-images.com)





Mark Hamblin (rspb-images.com)

**Numbers of eiders wintering in the UK have dropped by 17% over the past 25 years.**

## Climate change and wintering waterbirds

The distribution and abundance of waterbirds that spend the winter on our wetlands are already changing in response to climate change. Despite milder winters in the UK resulting in increased overwinter survival for many species, the indicator (on page 41) shows declines in wintering waterbirds.

In many cases this is explained by shifting distributions, linked to milder winters across the Continent. This is particularly evident in the reduced use of sites along the UK's east coast due to short-stopping in favour of sites in Europe. However, climate change is projected to reduce the breeding ranges of Arctic and sub-Arctic species which winter in the UK by 50% by the end of the century, which may cause further declines.

Most protected areas are considered likely to continue to support internationally important numbers of wintering waterbirds despite the changes in distribution and abundance of populations due to climate change. Indeed, the importance of these sites has been clear during particularly cold winters (eg 2009/10 and 2010/11) when the trend for wintering further east was reversed, and numbers on UK sites were much higher.

Potential changes in sea level may alter estuarine sediment patterns, with likely impacts on wintering waterbird communities, particularly at sites where coastal sea defences are maintained.

Our understanding of these changes is only possible due to the data collected by the large-scale, long-term monitoring programmes described here, but the context provided by international monitoring schemes is essential to interpreting these changes in the light of climate change's impact on populations outside the UK.

# 70 years of monitoring non-breeding waterbirds in the UK

Since monitoring started in 1947, the scheme which started as the National Wildfowl Counts has developed and grown over the 70 years to include all waterbirds. The methodology has remained largely unchanged throughout. The primary objectives of what is now the Wetland Bird Survey (WeBS) were established from the early days of the survey: determining trends in numbers of wintering waterbirds, identifying important sites and determining population size. Over 7,500 UK wetlands have been counted at least once, with typically 2,500 being covered each winter in recent times.

The number of species monitored has increased over time; waders (initially monitored by the Birds of Estuaries Enquiry launched in 1969) were counted alongside wildfowl from 1980 onwards, and the schemes formally merged in 1993, by which time the remaining waterbird families such as grebes, divers and cormorants were included, although gulls and terns are still only optional to count.

Additional surveys have been instigated to plug gaps in knowledge for species and habitats for which the WeBS Core Counts methodology is less suited (Goose and Swan Monitoring Programme, WeBS Low Tide Counts, Non-Estuarine Waterbird Survey and Winter Gull Roost Survey).

Today, WeBS is funded by a partnership of the BTO, RSPB and JNCC in association with WWT – all of whom have funded the schemes for over 40 years. Such long-term commitment shows the immense value to UK conservation of:

- the non-breeding population indices for over 100 waterbird species, stretching back to the mid-1960s for many species;
- the estimates of the sizes of non-breeding waterbird populations in Great Britain and Ireland;
- the records of all waterbirds, allowing assessment of populations of non-native and naturally colonising species;
- including data from the UK in global assessments of waterbirds, to determine both their population size and their conservation status;
- the long-term site monitoring, facilitating assessment of local change with national and international context, and evidence for sites that qualify for national and international designation and protection.

In the early years of the scheme, concern for the conservation of wildfowl species was centred on habitat gains and losses, water extraction, energy developments and wildfowling pressures. These issues remain pertinent today, but an international perspective has become essential, as the world has changed. The wintering patterns of migratory waterbird populations on the East Atlantic Flyway and how populations change and respond to weather conditions are of great interest, as conservationists aim to ensure waterbirds have sufficient wetland habitats where they are needed under various climate change scenarios (see pages 28–40).

Since the counts began, the number of volunteers taking part has grown to over 3,000. It is this network of volunteers that makes a scheme such as this possible. Without their dedicated time and support, we would not have the quality or quantity of data that we have today. And importantly, it is these data that enable conservationists and others to conserve and protect waterbirds in the UK and subsequently throughout their flyways.

**Top10 species with the most individuals recorded during WeBS Core Counts and predecessor surveys**

| | |
|---|---|
| Dunlin | 193,746,448 |
| Oystercatcher | 145,498,388 |
| Knot | 129,743,036 |
| Wigeon | 116,965,737 |
| Lapwing | 88,613,694 |
| Mallard | 71,016,765 |
| Black-headed gull | 62,612,609 |
| Brent goose | 59,999,302 |
| Teal | 49,369,555 |
| Redshank | 49,315,086 |





# Trends in wintering wetland birds in the UK

| Species | 25 year trend % (1989/90-2014/15)[1] | 10 year trend % (2004/05-2014/15)[2] | BoCC4 |
|---|---|---|---|
| Mute swan | 33 | -10 | |
| Bewick's swan | -95 | -74 | |
| Whooper swan | 21 | 17 | |
| Pink-footed goose | 120 | 51 | |
| European white-fronted goose | -69 | -32 | |
| Greenland white-fronted goose | -31 | -35 | |
| Icelandic greylag goose | -10 | 9 | |
| British greylag goose | 345 | 58 | |
| Canada goose | 55 | 12 | |
| Greenland barnacle goose | 175 | 57 | |
| Svalbard barnacle goose | 221 | 48 | |
| Dark-bellied brent goose | 17 | 42 | |
| Canadian light-bellied brent goose | 81 | 65 | |
| Svalbard light-bellied brent goose | 47 | -10 | |
| Shelduck | -32 | -27 | |
| Wigeon | 26 | -18 | |
| Gadwall | 149 | 15 | |
| Teal | 41 | 5 | |
| Mallard | -41 | -17 | |
| Pintail | -38 | -46 | |
| Shoveler | 70 | 7 | |
| Pochard | -67 | -42 | |
| Tufted duck | 6 | 7 | |
| Scaup | -22 | -51 | |
| Eider (except Shetland[3]) | -17 | -7 | |
| Goldeneye | -53 | -31 | |
| Red-breasted merganser | -20 | -20 | |
| Goosander | 6 | 11 | |
| Ruddy duck | -99 | -100 | |
| Little grebe | 98 | -6 | |
| Great crested grebe | 6 | -21 | |
| Cormorant | 50 | 3 | |
| Coot | 1 | -16 | |
| Oystercatcher | -26 | -15 | |
| Avocet | 718 | 41 | |
| Ringed plover | -59 | -37 | |
| Golden plover | 76 | -30 | |
| Grey plover | -30 | -19 | |
| Lapwing | -3 | -32 | |
| Knot | -16 | -16 | |
| Sanderling | 29 | 10 | |
| Purple sandpiper | -57 | -9 | |
| Dunlin | -40 | -19 | |
| Black-tailed godwit | 300 | 33 | |
| Bar-tailed godwit | -11 | 2 | |
| Curlew | -15 | -13 | |
| Redshank | -20 | -18 | |
| Turnstone | -47 | -24 | |

Shelduck by Ben Hall (rspb-images.com)

1. Long-term trends are the percentage changes between the smoothed index values for for 1989/90 and 2014/15.

2. Ten-year trends are the percentage changes between the smoothed index values for 2004/05 and 2014/15.

Calculation of smoothed indices by use of a generalised additive model is detailed further at **bto.org/webs-alerts**

3. British eiders comprise two populations; trends here exclude birds in Shetland that are of the race *faeroeensis*.

# Mixed fortunes of waders of non-estuarine coasts

Initial analysis of data collected as part of the 2015/16 nationwide Non-Estuarine Waterbird Survey (NEWS) suggests that numbers of several key wader species have decreased compared with previous surveys in 1984-85, 1997-98 and 2006-07.

Whilst WeBS coverage of estuaries and inland waterbodies is good, only a small proportion of the UK's non-estuarine coast is surveyed annually. NEWS 2015-16 was the fourth of these targeted surveys to collect information for waders and other waterbirds using these important areas, which are considered vulnerable to climate change impacts and changes to invertebrate communities.

A total of 700 volunteers together surveyed 9,200km of coast – a distance roughly equivalent to the return trip birds such as **purple sandpipers** and **turnstones** take from Arctic breeding grounds, such as north-east Canada, to winter in areas such as the Northumberland coast.

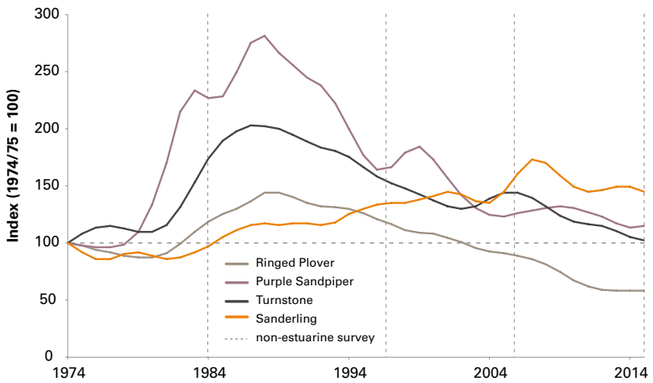
The majority of **ringed plovers**, **purple sandpipers**, **turnstones** and **sanderlings** present in mid-winter are on the non-estuarine coast, so NEWS is a particularly important information source for these species.

According to WeBS data, the **sanderling** population present in the UK in mid-winter has been increasing, both long-term (29% over 25 years) and short-term (10% over 10 years – see right). The NEWS survey in 2006-7 found that mid-winter **sanderling** numbers had declined on rocky coasts compared with the two earlier surveys. It was encouraging that the 2015-16 survey recorded the highest-ever numbers recorded on the non-estuarine coast.

The WeBS trends for **ringed plovers**, **purple sandpipers** and **turnstones** all demonstrate that numbers peaked in the mid-1980s, with subsequent ongoing declines, although the **purple sandpiper**'s decline has slowed in the past decade. Initial NEWS analyses suggest similar mid-winter declines for the non-estuarine coast, but the decline in **ringed plovers** here may be less severe than on estuaries. The NEWS estimate for **turnstone** in 2015-16 was 32% lower than in 2006/07 – a loss of 12,000 birds. Possible explanations for the observed changes include shifts in where birds are wintering, and/or declines in breeding productivity, which could both be related to climatic factors and local environmental factors such as changing sewage treatment and disposal practices.

NEWS also revealed increased numbers of **great northern divers** wintering off the coast of northern and western Britain and Northern Ireland. The WeBS population trend is also positive, with a trend of a 70% increase over the last 10 years. It is assumed that wintering birds come from the Icelandic and Greenland breeding populations, but no ringing or tracking studies have confirmed this.

**WeBS smoothed trends for non-estuarine wader specialists**



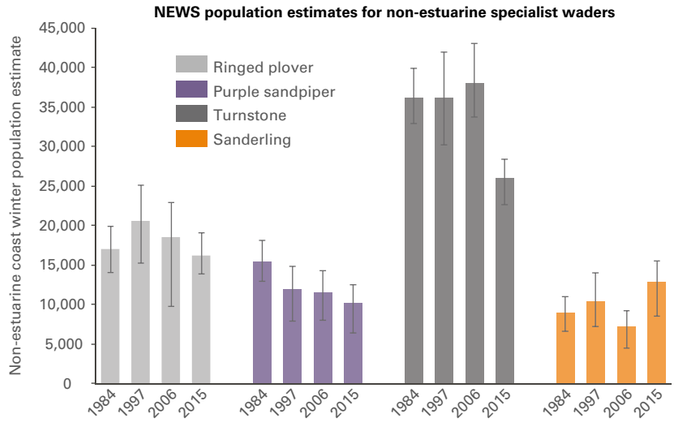

Andy Hay (rspb-images.com)

**Ringed plover declines were reported from WeBS and NEWS.**





**NEWS population estimates for non-estuarine specialist waders**




Oystercatcher by Andy Hay (rspb-images.com)

# Oystercatchers in decline

While NEWS found that the **oystercatcher** is still the most numerous and widespread of wader species on the non-estuarine coast - with an estimate of just under 70,000 – this is fewer than in previous surveys.

Over the past 25 years the oystercatcher's trend on estuaries and other WeBS sites has shown a decline of 2% a year. Internationally, **oystercatchers** are considered to be Near Threatened on the IUCN Global Red List.

Sustainable management of shellfish fisheries and habitat protection is considered vital for the future conservation of this species.

# Results of the 2015 International Swan Census

Over the last three decades, the Icelandic **whooper swan** population has more than doubled in size, with 34,004 individuals recorded during the most recent International Swan Census in 2015, compared with 16,731 in 1986. Almost the entire population winters in Great Britain and Ireland, and up until the 2015 census, results from the five-yearly surveys showed that Ireland supported the largest proportion.

However, as the population has grown, there have been indications of a gradual shift in the distribution, with the proportion wintering in Great Britain gradually increasing whilst it has been decreasing in Ireland. In 2015, the majority were recorded in Great Britain for the first time. The main reason for this shift is the increasing number of **whooper swans** recorded at the Ouse Washes, in Norfolk and Cambridgeshire, with the count in 2015 (7,171) being the highest recorded up until then, representing a seven-fold increase at the site since the 1995 census.

The 2015 census also revealed a large decline in the number of **Bewick's swans** wintering in the Great Britain and Ireland, with a total of 4,392 birds recorded, 38% lower than in 2010 and the lowest census total to date. The largest decline has occurred in Ireland, where census totals have fallen from a peak of 2,004 birds in 1990 to just 21 in 2015. Comparatively, the results from censuses between 1995 and 2010 indicated some stability in the number of birds wintering in Great Britain, before they fell sharply to 4,371 birds in 2015. Interestingly, Great Britain has also seen a gradual increase in the proportion of the north-west European population it supports since this wider population started declining in 2000. At the time of writing, final results from the census elsewhere in Europe are still being collated (by the Wetlands International/IUCN SSC Swan Specialist Group), so it will be interesting to see how well the population has fared overall, given the large decline observed in Great Britain.

More detailed results from the census can be found at: **monitoring.wwt.org.uk/our-work/goose-swan-monitoring-programme/species-accounts**

# Birds in the UK Overseas Territories

The land and seas for which the UK is responsible extend further than we might think. These include areas of tropical rainforest, vast coral reefs, volcanoes, ice caps and one of the largest maritime zones in the world. These can be found in the 14 UK Overseas Territories (OTs), which are spread around the world. The OTs are mostly small islands, and include two World Heritage Sites. The human inhabitants are British nationals, and the UK is responsible for helping to protect their incredible wildlife.

The OTs support globally significant levels of biodiversity, including over 1,500 endemic species. To date, around 28,000 species of plants, animals and fungi have been recorded in the OTs, but there are an estimated 70,000 further species yet to be documented. Climate change impacts will vary with geographic location but in many OTs the potential impacts have still not been assessed thoroughly.

As this report was being prepared, the devastating impact of Hurricanes Irma and Maria on Anguilla, the British Virgin Islands, the Turks and Caicos Islands and Montserrat was beginning to come to light. Our thoughts are with all our partners as they begin the long and painful process of rebuilding their communities. Hurricanes are predicted to become more intense in the region due to climate change.

Current understanding of the vulnerability to biodiversity loss on the OTs related to climate change includes impacts of numerous interacting factors. These include:

- sea-level rise – exacerbating the impact of flooding;
- ocean acidification and rising sea temperatures – projected to be warmer all year round by the latter part of the century. This would cause bleaching and extensive mortality to corals;
- increasing frequency and strength of storms;
- storm surges and erosion;
- loss of mangroves which act as natural sea defences;
- a tendency towards both more dry spells and extreme rainfall, increasing risks of drought as well as flooding;
- limited adaptation options for endemic species that are already affected by invasive species and other factors.

## How protected are the UK's Overseas Territories?

The world's governments have agreed 20 "Aichi" targets within the Strategic Plan for Biodiversity 2011–2020. Target 11 focuses on protected areas and other effective area-based measures, and seeks conservation of at least 17% of terrestrial and inland water and 10% of coastal and marine areas.

An assessment of protected area coverage across the UK's OTs shows that eight have protected areas considerably exceeding the target, with six of these covering 30% or more of their land area. Overall coverage across the OTs varies: currently four have less than 5% of their land area in protected areas.

The Aichi target emphasises the need for areas of particular importance for biodiversity to be encompassed in protected areas or other site-based conservation mechanisms. The assessment found that currently only 8% of the area encompassed in Important Bird and Biodiversity Areas across the Territories is protected.

Increasing protected area coverage through local processes should be a priority alongside other actions: for example tackling invasive species, restoring habitat and controlling development.

In Bermuda, Turks and Caicos, the British Virgin Islands and Cayman Islands, this is already underway with a number of protected areas awaiting approval and/or designation. Montserrat is currently working with stakeholders and consulting on Marine Protected Areas.

Improving coverage across all the OTs will require investment in improving knowledge of distribution and density of species, developing measures to enforce protection and effective monitoring, while also balancing conservation priorities and environmental protection with economic development.

More details here: Wilkinson *et al.* (2017). *Environmental Conservation*, First View, 1–8.

## Recovery of three endemic land birds

Four land bird species, the **Henderson lorikeet, Henderson fruit dove, Henderson rail** and **Henderson reed warbler**, are endemic to Henderson Island, part of the Pitcairn Group in the South Pacific. These have been monitored, following the failed rodent eradication attempt on the island in 2011. Introduced Pacific rats have caused declines and even extinctions in a number of species on Henderson. However, whilst unsuccessful, the eradication attempt did reduce the number of rats substantially for a year or two.

Between 2011 and 2015, point counts were conducted at 25 sampling locations and abundance trends were calculated to see how populations of these four species have responded to the temporary respite from high levels of predation by rats.

**Henderson reed warblers** more than doubled in abundance, and **Henderson fruit doves** increased slightly over the period. **Henderson rails** increased to pre-eradication levels, showing that efforts to protect these birds, which were known to be susceptible to the poison bait used to kill rats, were successful. There was no change detected in the abundance of the **Henderson lorikeet**, although this species is the most mobile of the four species and population estimates lacked the precision needed to assess whether the population had changed.

A temporary reduction of rat predation pressure may have benefitted the **Henderson reed warbler**, and less rat competition for fruit may have helped the **Henderson fruit dove**. However, because a long drought may have naturally suppressed bird populations prior to the rat eradication operation in 2011, we cannot unequivocally ascribe the population increases to the temporary reduction of the rat population. We encourage robust monitoring of island biodiversity both before and after attempts to eradicate invasive species.

RSPB (rspb-images.com)

**The Henderson fruit dove is one of four bird species found only on Henderson Island.**

## Bermuda - conservation action leads to increased cahow population

The **Bermuda petrel**, or **cahow**, is a burrow-nesting seabird endemic to Bermuda and is listed on Appendix I of the Convention on Migratory Species. An innovative mix of habitat management and active population management measures have led to encouraging increases in the population. There were 117 breeding pairs in the 2016-2017 breeding season, with 61 chicks successfully fledged in spring 2017.

The **cahow** nesting islands are limited-access nature reserves under the Bermuda National Parks Act 1986 and the **cahow** is given the highest level of protection possible under the Protected Species Act 2003 of Bermudian law.

Measures have been taken to stop nest-site competition with the **white-tailed tropicbird**, by fitting baffles with specially-sized holes at nest entrances - these exclude tropicbirds but allow entry by the petrels. Prior to this, up to 75% of petrel chicks were killed each year by tropicbirds that entered and took over the nests.

Although there have been at least six cases of rats swimming out to one or more of the **cahow** nesting islands since the late 1990s, there has only been one case of petrel chicks being killed by rats during these episodes; in all other cases, the rats were killed by rodenticides before they could cause any harm. There is an active annual rodenticide programme which aims to keep the nesting islands rat-free.

A translocation project to move **cahow** chicks from low-lying nesting islands to establish a new nesting colony on the larger and more elevated Nonsuch Island has proved successful. Nonsuch Island has been restored to a pre-colonial forest habitat, and invasive species are strictly controlled. This project, initiated in 2013, has established a new nesting colony which is already up to 16 nesting pairs in 2016. A second colony on Nonsuch Island was established to provide added security should a catastrophic event affect the first colony.

By the summer of 2017, 65 fledglings had been translocated to the second colony, and one pair had returned to nest. New artificial concrete or prefabricated plastic nest burrows are being constructed on Nonsuch and the original nesting islands, to provide new nesting habitat and maximise the carrying capacity of the smaller nesting islands, which lack soil for the petrels to dig their burrows. Bermuda has been struck directly by four hurricanes in the last three years, which have caused serious erosion and flooding on the nesting islands; some are completely submerged during storms.

In addition, in 2013 nesting activity was confirmed at a sixth island (Southampton Island) in the Castle Harbour Islands Nature Reserve, about 1km from Nonsuch Island. At-sea distribution was previously unknown, but geolocator tags have been deployed and birders in other localities have been asked to look out for and report **cahows** at sea.

The Cahow Recovery Programme continues; latest updates can be found in annual reports online at **environment.bm/cahow-recovery-programme**
Tours of Nonsuch allow school children and adults to see **cahow** chicks in the nesting season, and adults can be seen flying during offshore boat tours. A camera, known as the "CahowCam", streams live footage from a nest on Nonsuch Island to the internet at: **nonsuchisland.com/live-cahow-cam**

Alison Copeland

**The cahow population is closely monitored.**



Birds in the UK Overseas Territories


Alison Copeland

## Rockhopper penguins facing challenges

Numbers of **northern rockhopper penguins** have been decreasing across their range following exploitation by humans during the late 19th century. The causes of the current decline are poorly understood and may be numerous. The following factors are all likely to be implicated: introduced species and diseases; changes in sea surface temperature and marine productivity; human activities and pollution; and increasing competition for habitat and food with a rapidly-growing fur seal population.

The global population is now conservatively estimated at around 250,000 breeding pairs and still declining. Approximately 85% of the global **northern rockhopper penguin** population is found within the OTs in the Tristan da Cunha archipelago and Gough Island, and the species is currently listed as Endangered on the IUCN Global Red List.

**Northern rockhopper penguins** will face new challenges in the coming decades as climate change continues to alter marine foraging habitat through warming of the Southern Ocean's surface waters and large-scale climate anomalies having a negative impact on foraging habitat and the species' diving behaviour. A decline in breeding success has been attributed to decreases in prey availability. Furthermore, unusual or extreme weather events linked to climate change can affect breeding success directly by causing egg or chick mortality.

Zoltan Major (shutterstock.com)

# Current and planned surveys

The information summarised in *The state of the UK's birds 2017* is drawn from the annual and periodic monitoring programmes described below, and from the work of individual ornithologists. Anyone interested in taking part in these surveys should contact the relevant organisations at the addresses given on page 55.

The **Breeding Bird Survey (BBS)** is the monitoring scheme for common and widespread breeding land birds throughout the UK. It aims to provide data on population trends to inform and direct conservation action. It is a partnership between the British Trust for Ornithology (BTO), the Joint Nature Conservation Committee (JNCC) (on behalf of the Department of Agriculture, Environment and Rural Affairs, Northern Ireland (DAERA), Natural England (NE), Natural Resources Wales (NRW), Scottish Natural Heritage (SNH)) and the RSPB.
**Contact the BTO.**
**bto.org/bbs**
**@BBS_birds**

The **Wetland Bird Survey (WeBS)** is a partnership between the BTO, the RSPB and the JNCC (the latter on behalf of the statutory nature conservation bodies: DAERA, NE, NRW and SNH) and in association with the Wildfowl & Wetlands Trust (WWT).
**Contact the BTO.**
**bto.org/webs**
**@WeBS_UK**

The **Waterways Breeding Bird Survey (WBBS)** has been running since 1998. This scheme, and its predecessor the Waterways Bird Survey (WBS) that ran from 1974 to 2007, aims to monitor riverside breeding birds, particularly waterway specialists, across the UK.
**Contact the BTO.**
**bto.org/wbbs**
**@BBS_birds**

Andy Hay (rspb-images.com)

**There are many ways for volunteers to contribute.**

The **Goose & Swan Monitoring Programme (GSMP)** is a suite of surveys (funded under the WWT, JNCC and SNH partnership), designed to accurately assess the abundance and breeding success of the UK's native geese and migratory swans during the non-breeding season.
**Contact the WWT.**
**monitoring.wwt.org.uk/our-work/goose-swan-monitoring-programme/**
**@WWTworldwide**

The **BTO Heronries Census** collects counts of apparently occupied nests each year, from as many heronries as possible throughout the UK. It also aims to monitor populations of colonial waterbirds, especially **grey herons**, **little egrets** and **cormorants**.
**Contact the BTO**.
**bto.org/heronries-census**
**@_BTO**

The **Seabird Monitoring Programme (SMP)** gathers information on breeding numbers, breeding success and other parameters to help us understand drivers of change and to target conservation action. Co-ordinated by JNCC, it is a partnership between the statutory nature conservation agencies, and research and conservation organisations.
**Contact the JNCC.**
**jncc.defra.gov.uk/page-1550**
**@JNCC_UKseabirds**

Ed Marshall (rspb-images.com)

**Bird surveys take place all over the UK.**

**The Big Garden Birdwatch** is the largest wildlife survey in the world. Its simple design (one hour watching birds in your garden or local park over one weekend in January) means around half a million people take part every year. The data provide an excellent snapshot of garden bird numbers across the UK.
**Contact the RSPB.**
**rspb.org.uk/birdwatch**
**@RSPBScience**

**Garden BirdWatch (GBW)** is a year-round scheme recording the weekly occurrence and numbers of birds in participants' gardens. The data collected provide valuable information on annual and seasonal changes in bird use of rural and urban habitats. These can be related to population trends in the wider countryside.
**Contact the BTO.**
**bto.org/gbw**
**@BTO_GBW**

**BirdTrack** is a year-round bird recording system run by the BTO in partnership with the RSPB, BirdWatch Ireland, the Scottish Ornithologists' Club and the Welsh Ornithological Society. The collection of species list data from a large number of observers helps a range of national research and monitoring objectives.
**Contact the BTO.**
**birdtrack.net**
**@BirdTrack**

**The Ringing Scheme** is run by the BTO and covers Britain and Ireland. It is funded by a partnership of the BTO, the JNCC (on behalf of DAERA, NE, NRW and SNH), the National Parks and Wildlife Service (Ireland) and the ringers themselves. Volunteer bird ringers collect data on the survival, productivity, movements and condition of birds. Project ringing (such as the Constant Effort Sites Scheme, the Ringing Adults for Survival project, and other targeted ringing) forms an important part of the Scheme.
**Contact the BTO.**
**bto.org/ringing**
**@_BTO**

**The BTO Nest Record Scheme (NRS)** gathers vital information on the breeding success of the UK's birds by asking volunteer nest recorders to find and follow the progress of individual birds' nests. The scheme is funded by a partnership of the BTO and the JNCC (on behalf of DAERA, NE, NRW and SNH).
**Contact the BTO.**
**bto.org/nrs**
**@_BTO**

**A programme of UK-wide surveys** of priority breeding species are conducted under the Statutory Conservation Agencies and RSPB Breeding Bird Scheme (SCARABBS) Programme.
**@RSPBScience**

**Seabirds Count** is the fourth breeding seabird census to be conducted in the UK and Ireland. It is being coordinated by the Joint Nature Conservation Committee and recruitment of regional co-ordinators is underway. Volunteers are currently being sought to assist with surveys during the 2018 and 2019 breeding seasons. Please contact **seabirdscountcoordinator@jncc.gov.uk** if you can help.
**Contact the JNCC.**
**@JNCC_UKseabirds**

# Acknowledgements


Monitoring of birds in the UK and the Overseas Territories, such as that covered in this report, involves a broad partnership of government agencies, NGOs, sponsors and independent ornithologists, including:

BirdLife International, BirdWatch Ireland, British Birds, British Trust for Ornithology, British Waterways, Centre for Ecology and Hydrology, Darwin Plus Initiative, Department of Agriculture, Environment and Rural Affairs, Northern Ireland, Department for Environment, Food and Rural Affairs, Department of Environment and Natural Resources, Government of Bermuda, Environment Agency, Environment Wales, European Bird Census Council, European Union Life Programme, Forestry Commission, Forest Enterprise, Game and Wildlife Conservation Trust, Greenland White-fronted Goose Study, Irish Brent Goose Research Group, Irish Whooper Swan Study Group, Isle of Man Department of Environment, Food and Agriculture, Joint Nature Conservation Committee, Manx BirdLife, Ministry of Defence, National Trust, National Trust for Scotland, Natural England, Natural Resources Wales, Northern England Raptor Forum, Northern Ireland Raptor Study Group, Raptor Study Groups, Rare Breeding Birds Panel, the Royal Society for the Protection of Birds, Scottish Government Environment and Forestry Directorate, Scottish Natural Heritage, Scottish Ornithologists' Club, Scottish Raptor Monitoring Scheme, Scottish Raptor Study Group, Seabird Group, Shetland Oil Terminal Environmental Advisory Group, Wales Raptor Study Group, Welsh Ornithological Society, the Wildfowl & Wetlands Trust, and the Wildlife Trusts.

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Whimbrel by Oliver Smart (rspb-images.com)



# Who we are

*The state of the UK's birds 2016* is also available online on the websites of the BTO, RSPB and WWT (see addresses below).


**Designed and published by the RSPB on behalf of:**

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Registered charity no 216652 in England & Wales; SC039193 in Scotland.

**Joint Nature Conservation Committee (JNCC)**

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**@JNCC_UKseabirds**

**Natural England (NE)**

4th Floor, Foss House
Kings Pool
1-2 Peasholme Green
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YO1 7PX
**Tel:** 0300 060 1911

**gov.uk/government/organisations/natural-england**
**@NaturalEngland**

**Natural Resources Wales (NRW)**

Tŷ Cambria
29 Newport Road
Cardiff
CF24 0TP
**Tel:** 0300 065 3000

**naturalresources.wales**
**@NatResWales**

**Department of Agriculture, Environment and Rural Affairs, Northern Ireland (DAERA)**

Klondyke Building
Cromac Avenue
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**Wildfowl & Wetlands Trust (WWT)**

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**monitoring.wwt.org.uk**
**@WWTworldwide**

Registered charity no. 1030884 in England and Wales, SC039410 in Scotland.

**The Royal Society for the Protection of Birds (RSPB)**

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Sandy
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SG19 2DL
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**RSPB Northern Ireland Headquarters**
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**RSPB Scotland Headquarters**
2 Lochside View
Edinburgh Park
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**Tel:** 0131 317 4100

**RSPB Wales Headquarters**
Castlebridge 3
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**rspb.org.uk**
**@RSPBScience**
**@Natures_Voice**

The RSPB is a registered charity in England & Wales 207076, in Scotland SC037654.








Front cover image: golden plover by Mark Hamblin (rspb-images.com)

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