WeBS

Waterbirds in the UK 2016/17

The annual report of the Wetland Bird Survey

BTO Looking out for birds

rspb giving nature a home

JNCC

in association with WWT

WATERBIRDS IN THE UK 2016/17

The Wetland Bird Survey (WeBS) is the principal scheme for monitoring the UK's wintering waterbird populations, providing an important indicator of their status and the health of wetlands. *Waterbirds in the UK 2016/17* is the 36th WeBS annual report and comprises this summary report and data at **www.bto.org/webs-reporting**.

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THE WeBS PARTNERSHIP

The Wetland Bird Survey (WeBS) is a partnership jointly funded by BTO, RSPB and JNCC, in association with WWT with fieldwork conducted by volunteers.

The permanent members of the WeBS Steering Committee in 2016/17 were Teresa Frost (BTO), Andy Musgrove (BTO), Dawn Balmer (BTO), David Stroud (JNCC), Deborah Procter (JNCC), Simon Wotton (RSPB) and Richard Hearn (WWT).

THE WeBS TEAM AT BTO

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Other national waterbird surveys - details of (and contacts for) other waterbird surveys can be obtained via the websites of the WeBS partner organisations.

ACKNOWLEDGEMENTS

We are indebted to the time and skills of the thousands of WeBS Counters who collected the data used in this report and to the invaluable efforts of the WeBS Local Organisers who are listed on the back cover.

The WeBS Local Organiser Advisory Committee (LOAC) (members listed on page 39) provided advice on behalf of counters and Local Organisers. The BTO Information Systems team delivered essential technical assistance and continues to develop and provide assistance for WeBS Online.

We are also grateful to the following for providing supplementary information, data inputting, proof-reading and particularly invaluable help in 2016/17: GSMP, Colette Hall, Mark Hammond, Sarah Harris, Jane Herridge, Nick Lewis, Richard Minter, Steve Pritchard, Deborah Procter, RAFOS, Anna Robinson, SOTEAG and Chris Waltho. Grateful thanks to all and apologies to anyone who has been inadvertently missed.

Report content and production was by Teresa Frost, Dawn Balmer, Heidi Mellan, Neil Calbrade and Henrietta Pringle. The article on the Christmas Bird Counts in Iceland was contributed by Kristinn Skarphéðinsson, the article on Bitterns by Simon Wotton and Greenland White-fronted Geese by David Stroud (Greenland White-fronted Goose Study (GWGS)).

The painting of 'Snipe & Teal' used on the cover of this report is by Michael Warren. For more of Michael's work, see www.mikewarren.co.uk. All other artists and photographers are acknowledged on the pages of this report.

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CITATION

Frost, T.M., Austin, G.E., Calbrade, N.A., Mellan, H.J., Hearn, R.D., Stroud, D.A., Wotton, S.R. & Balmer, D.E. 2018. *Waterbirds in the UK 2016/17: The Wetland Bird Survey*. BTO, RSPB and JNCC, in association with WWT. British Trust for Ornithology, Thetford.

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Online Resources

More information, including site tables and trends for all regular WeBS species, is available online at:
www.bto.org/webs-reporting

This summary report can be downloaded from the WeBS website at:
www.bto.org/webs-publications

The online and summary outputs in conjunction constitute the report *Waterbirds in the UK 2016/17.*

CURLEW SANDPIPER BY DAVE WRAGG; WATER RAIL BY JOHN HARDING; RED-CRESTED POCHARDS BY DAVE KING; COMMON GULL BY SARAH KELMAN

Waterbird headlines from the WeBS year

3,156 registered WeBS volunteers

Just a small selection of notable stories from 2016/17

See all the numbers and trends at **www.bto.org/webs-reporting**

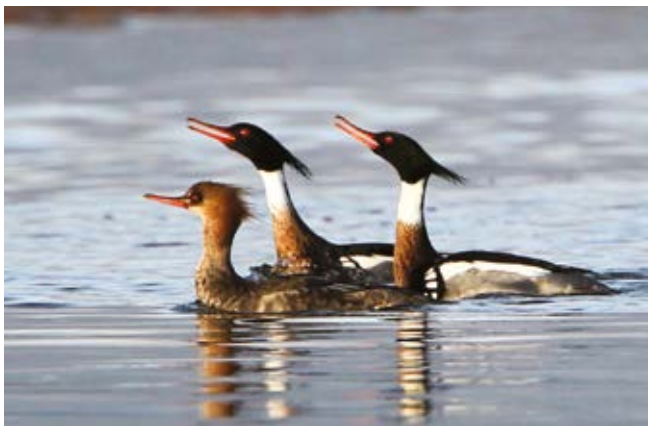
Population index values reached their highest recorded levels for many species for the 2016/17 WeBS year. Spoonbill, Avocet, Crane, Little Egret and Great White Egret continue their expansions. Numbers are greater than ever for introduced species Mandarin Duck and Egyptian Goose (pages 22–23). All populations of Barnacle Geese are showing long-term increases and their indices reached record highs, as did Black-tailed Godwit, Cormorant, Shoveler and Teal (pages 30–31). Other species are faring less well. Red-breasted Merganser, Curlew and Goldeneye had their lowest index values for at least 30 years and there were record lows for Pochard, Eider and Mallard. There are European breeding declines for Pochard and Eider, but wintering Mallard declines could be related to fewer releases by shooting estates or perhaps short-stopping by Russian birds.

NEIL CALBRADE

PAUL HILLION

The summer of 2016 was reported as productive for many arctic-breeding species, including Greenland White-fronted Goose (pages 26–27). Passage waders such as Curlew Sandpiper and Sanderling appeared earlier and in greater numbers than in recent years. The winter of 2016/17 was mild in the UK but cold in large parts of continental Europe, resulting in relating cold weather movements and increased numbers in the UK of species such as Pintail and Wigeon (pages 8–9). Reedbed creation and restoration has benefited characteristic waterbirds of reed and associated habitats, such as Bittern. This species is now widely distributed, particularly in winter (pages 16–21). Skulking species such as Snipe (page 32) and Water Rail (page 20) are challenging to monitor, but there is little evidence of population change for either from WeBS counts.

Waterbirds in the UK has long reported site totals for "principal sites" that hold at least 20,000 birds or more, calculated as the sum of each species annual maxima (pages 12–13). Totals for all WeBS sites have been added to the online report with a new 'Site Totals' tab, with an interactive interface to allow the user to include or exclude gulls, non-native waterbirds and supplementary counts in the tables. Another online innovation this year is an interactive Low Tide count mapping facility, allowing up to four maps of combinations of site, species or survey year to be compared together (page 7).



JOHN DUNN

WeBS Core Counts 2016/17 - in numbers

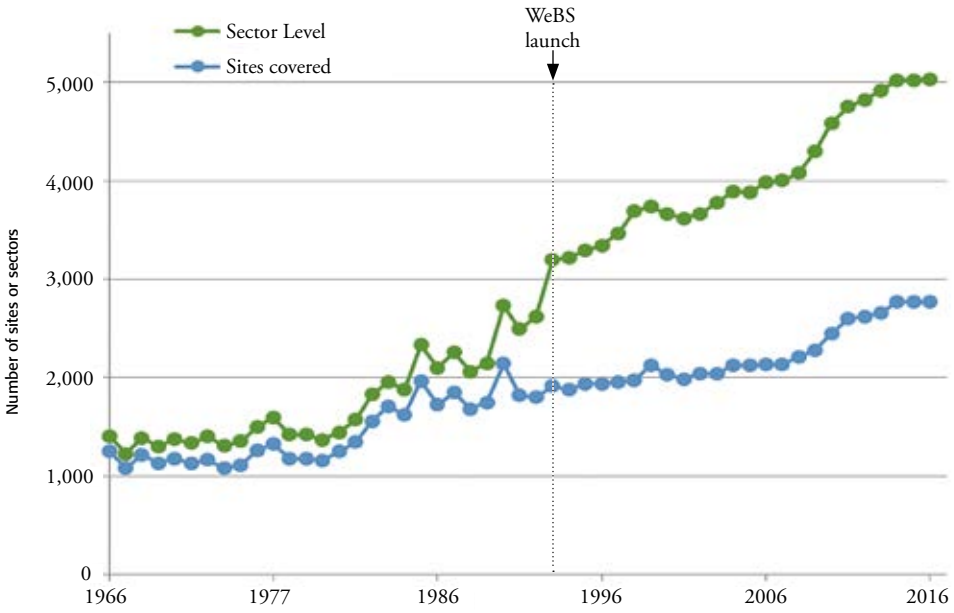
Core Counts were carried out at 5,032 WeBS sectors (count units) at 2,771 sites from July 2016 to June 2017.

Not all Core Counts are linked to individual counters in the WeBS Online database, but an increasing number are; 2,165 counters were associated withWeBS Core Count visits made in 2016/17.

There were 38,413 count visits, 71% in the core September–March period.

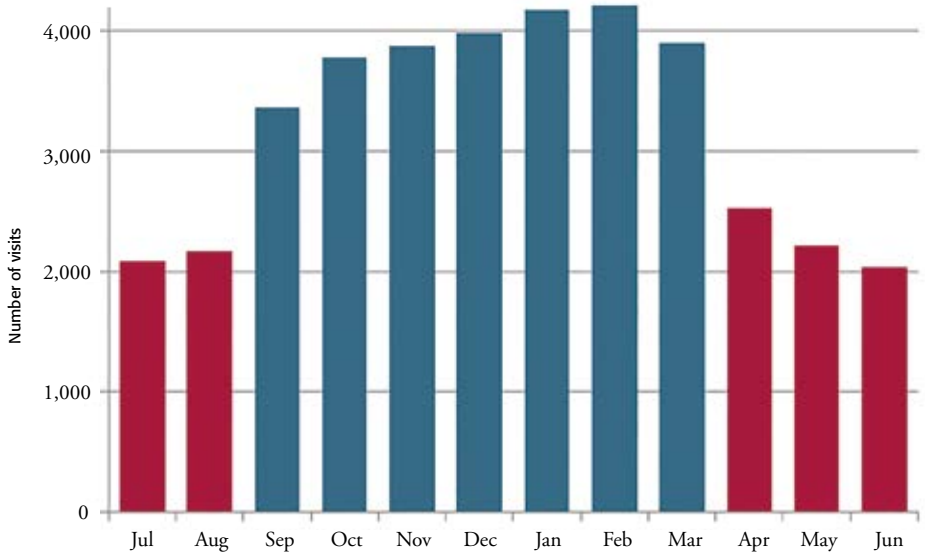
Core Count dates in 2016/17

2016	2017
24 July	15 January
21 August	12 February
18 September	12 March
16 October	9 April
13 November	14 May
18 December	11 June



▲ **Number of WeBS sites and sectors covered 1966/67–2016/17.**

▼ **Number of WeBS Core Count visits in 2016/17 by month.**



Goose Censuses

Some populations of wintering geese were censused as part of the WWT/ JNCC/SNH Goose & Swan Monitoring Programme. Counts of Taiga Bean Geese were provided by the Bean Goose Action Group (Slamannan Plateau) and RSPB (Middle Yare Marshes).

Surveys of Pink-footed and Icelandic Greylag Geese are undertaken at, primarily, roost sites in October and November as part of the Icelandic-breeding Goose Census. British Greylag Geese at key sites in Scotland were censused by a number of local management groups.

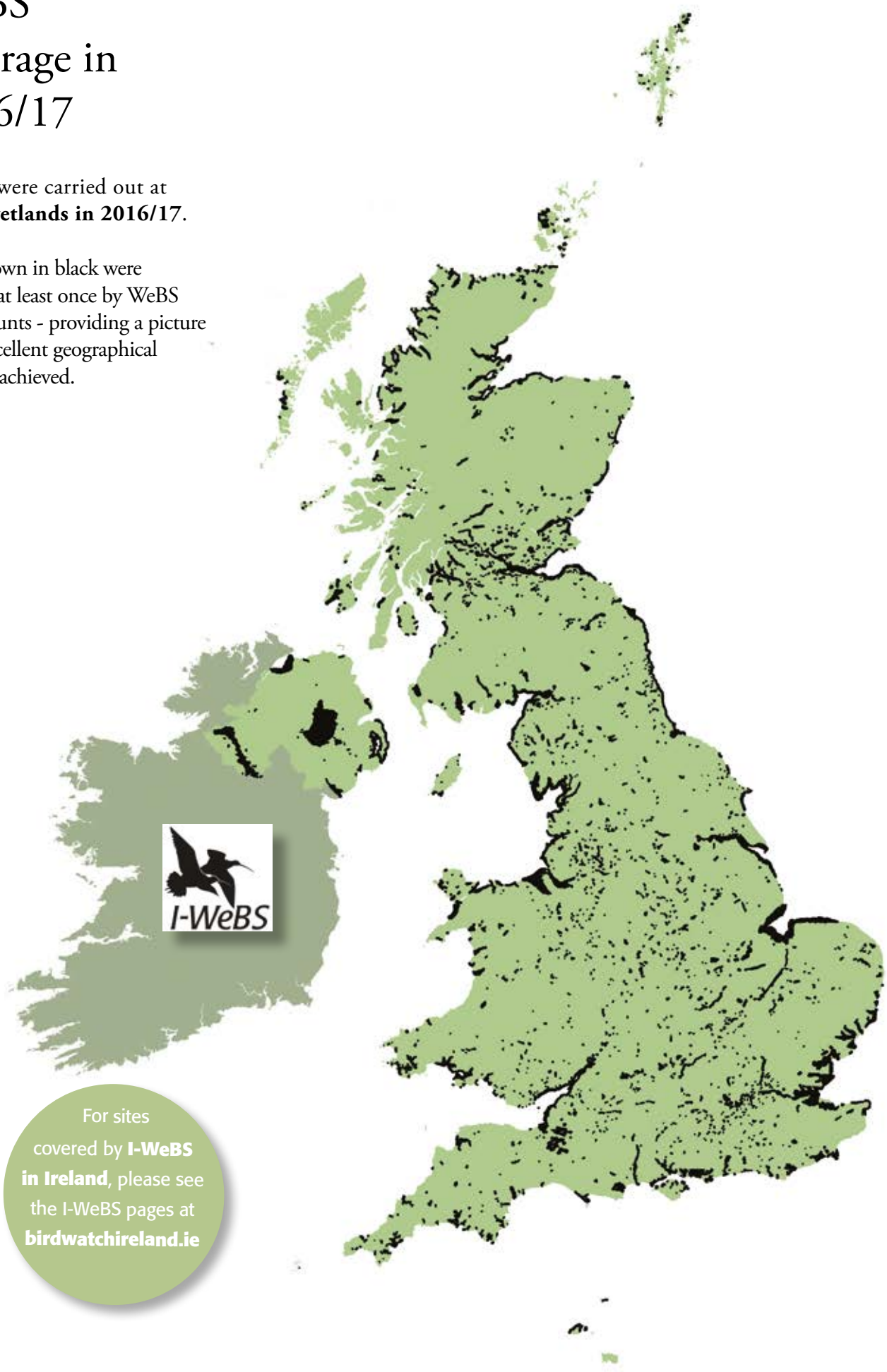
Greenland White-fronted Geese were monitored by the Greenland White-fronted Goose Study. Greenland Barnacle Geese were counted by Scottish Natural Heritage on Islay and other key locations by RSPB Scotland and volunteers, while WWT counted Svalbard Barnacle Geese on the Solway.

Results from goose surveys are described in more detail on the species account pages at **http://monitoring.wwt.org.uk/our-work/goose-swan-monitoring-programme/species-accounts/**

WeBS coverage in 2016/17

Counts were carried out at **2,771 wetlands in 2016/17**.

Areas shown in black were counted at least once by WeBS Core Counts - providing a picture of the excellent geographical coverage achieved.



For sites covered by **I-WeBS in Ireland**, please see the I-WeBS pages at **birdwatchireland.ie**

UK Low Tide Counts 2016/17

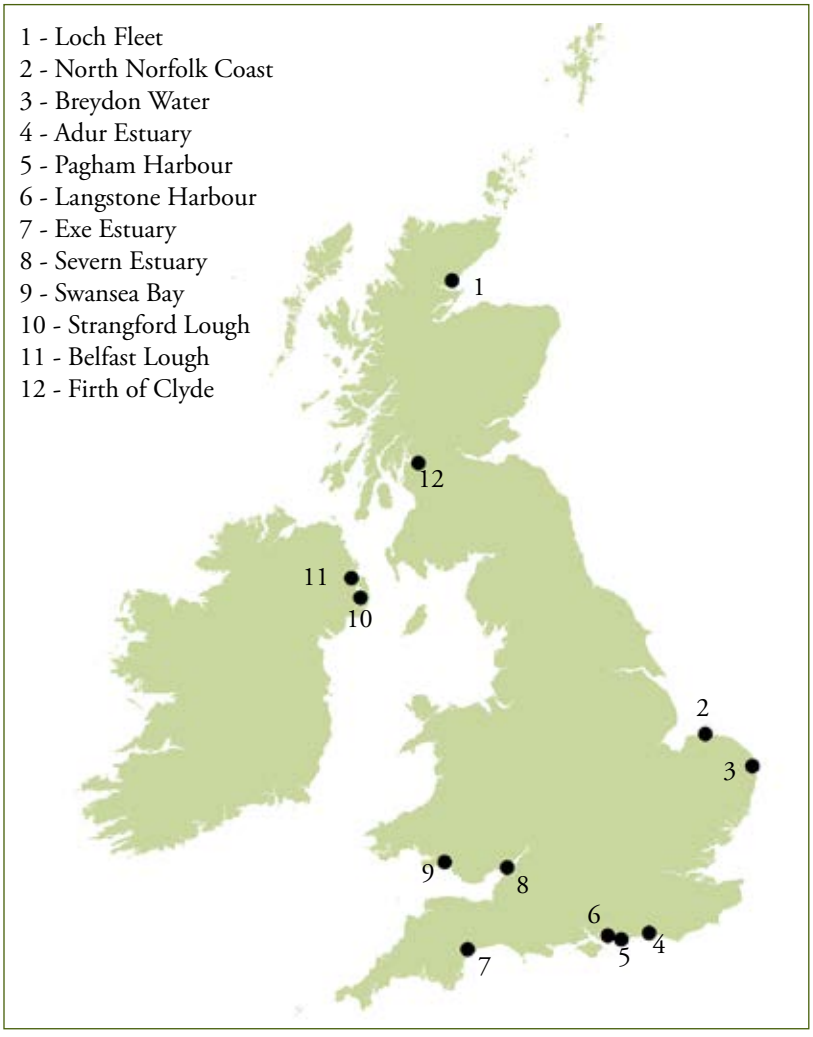
Twelve UK estuaries were counted at low tide, generating important data about feeding areas

The WeBS Low Tide Count scheme facilitates the collection of information about use of the UK's estuaries by waterbirds at low tide. The scheme has flourished since its inception in the winter of 1992/93, with all the major estuaries in the UK having been counted at least once. The scheme aims to monitor, assess and regularly update information on the relative importance of intertidal feeding areas of UK estuaries for wintering waterbirds, and in doing so complements information gathered through the WeBS Core Counts.

Presentation of WeBS low tide information typically takes two forms: (i) tabulated statistics of peak numbers and mean densities, and (ii) dot density maps to give a visual representation of species' foraging densities across a site. Dots do not represent the precise positions of birds; they are assigned to habitat components proportionally and placed randomly within those areas. No information about distribution of birds at a finer scale than the count sector level should be inferred. For all maps on the online reporting interface, one dot is equivalent to one bird.

During 2016/17, WeBS Low Tide Counts were carried out at 12 estuaries. Results from the counts on the Exe Estuary are presented on pages 34–35 of this report.

Further information about WeBS Low Tide Counts are available online via **www.bto.org/websreporting-lowtide** including data summaries and dot density distribution maps for different estuaries and species. As of the 2016/17 report, dot density maps are available for all species and years, including the facility to show any combination of site, species and years side by side for comparison.



▲ Top - Screenshot of the new-look Low Tide page on the Online Report. Bottom - Estuaries counted as part of WeBS Low Tide Count scheme in 2016/17.

Dry and mild conditions

Weather and migration context for 2016/17.

The first half of August was unsettled, and there were strong southerly winds. Autumn 2016 was drier than usual and there were easterly winds in October. November was cold and sunny.

The main winter period was mostly dry, with little prolonged stormy weather, until February which saw slightly above average rainfall. The December – February period was mild on average, with only 1989, 2007 and 1998 having fewer air frost days.

South-east Britain experienced cold continental air at times, related to a period of exceptionally cold weather in southern and eastern Europe in January 2017. Many waterbirds in that region were reported during International Waterbird Counts to have died due to severe ice and snow.

Spring 2017 was warm across the UK, the second warmest since Met Office records began, and was also drier than normal.

The generally mild conditions around WeBS core count dates meant WeBS counters' percentage ice cover estimates for their count sectors were lowest since the 2003/04 –2007/08 spate of milder conditions, apart from the exceptionally mild 2013/14 winter.

Migration Notes

In late September 2016, movements of common species began to be noted, including Pink-footed and Brent Geese. As usual these were too late for September Core Counts, with numbers starting to build on October counts. An influx of 484 Snipe was noted at North Ronaldsay, Orkney.

In late October, several flocks of Tundra Bean Geese arrived, earlier and in larger numbers than usual. An influx of inland Scaup was reported in November, perhaps related to cold conditions in Scandinavia.

Inward spring migration began in earnest with southerly winds in mid-March 2017, with Garganey quickly moving north and Little Ringed Plovers also returning.

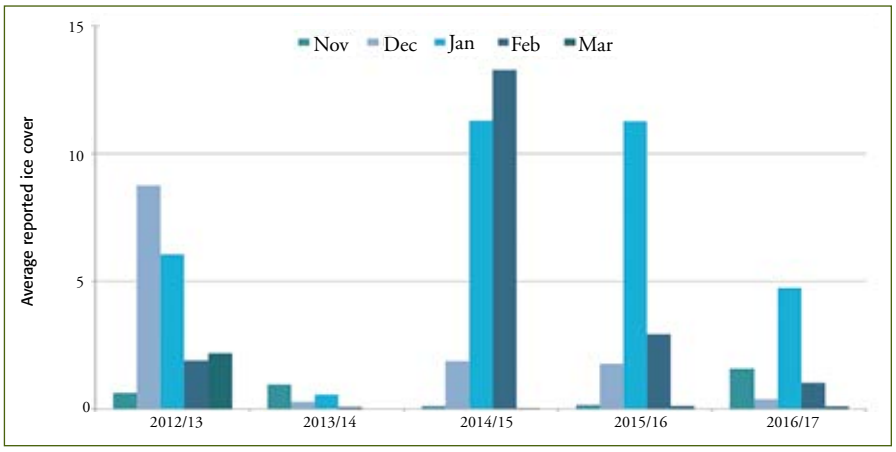
The 2016 Arctic Breeding Season

Spring 2016 was early in the arctic, and the summer warm. The numbers of both rodents and Arctic Foxes were reported to be low from several research stations. Reports of breeding success were as usual mixed from different parts of the arctic. In Russia at Medusa Bay, Taimyr, wader nesting success was reported to be good thanks to the favourable conditions, with 87.5–100% of nests fledging in 2016 compared to 0–16.7% in 2015.

WeBS counts for July-September 2016 suggest there was an early return of arctic breeding waders. The Sanderling monthly index peak was in July, rather than the more usual August.

There was a notable Curlew Sandpiper passage, with non-WeBS reports that several sites had flocks of over 50 birds, including 258 at RSPB Frampton Marsh on 23rd August. The peak national WeBS core counts total was the highest since 2011/12 and was also early, in August rather than the usual September. It is possible that southerly winds in mid-August 2016 contributed to the influx, perhaps in conjunction with a good breeding season.

WeBS annual index values for many wildfowl and waders increased compared with 2015/16 (see page 10). For some species this may relate to good arctic breeding conditions and/or mild winter conditions in the UK compared to cold conditions on the continent.



▲ **Average WeBS sector ice cover for 2012/13 – 2016/17, as reported by counters for the months November – March.**

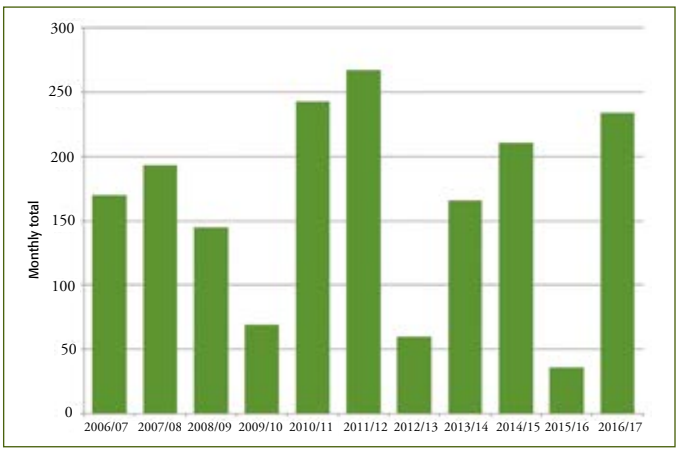
SOURCES...

Climate summaries from
www.metoffice.gov.uk

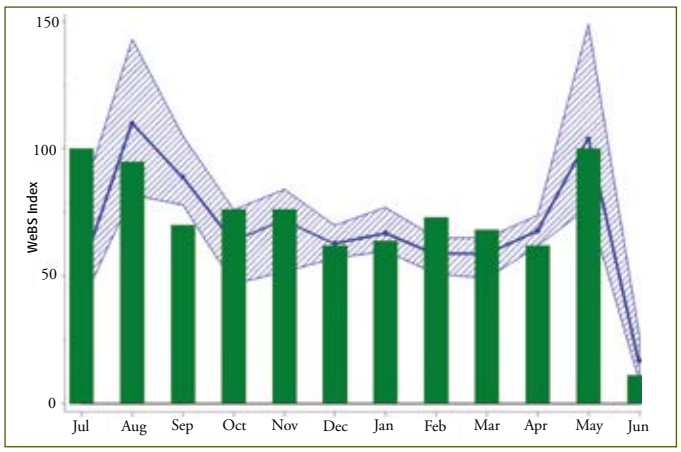
Migration updates from
btomigrationblog.blogspot.co.uk

Arctic breeding from
www.arcticbirds.net

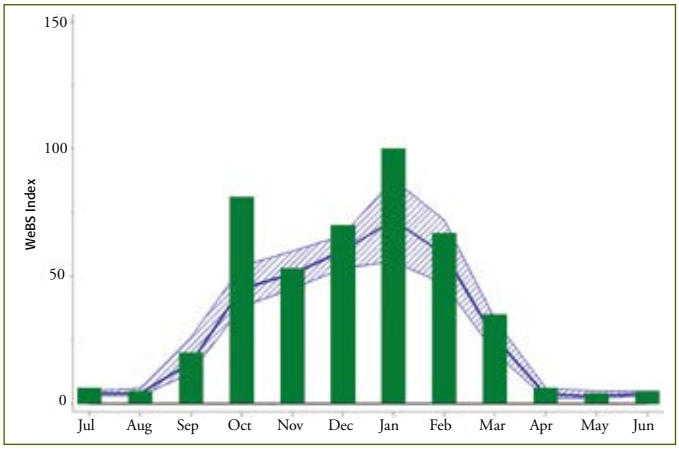
GABRIEL OZON



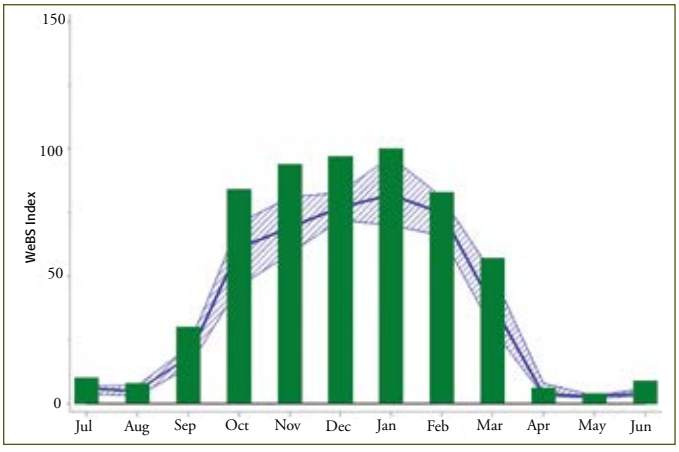
▲ Autumn passage: Maximum WeBS count total of Curlew Sandpiper in Great Britain (Peak occurred in September in 2006/07 – 2015/16, in August in 2016/17).



▲ Early passage: The UK Sanderling month index plot suggests higher than normal numbers arriving in July.
Green bars = 2016/17; blue line/hatched area = previous 5-year mean/range.



▲ Cold weather movements: The UK Pintail month index plot suggests higher than usual numbers arriving in October and again in January.
Green bars = 2016/17; blue line/hatched area = previous 5-year mean/range.



▲ Winter influx: The UK Wigeon month index plot indicates more birds were present throughout the winter than in the previous five years.
Green bars = 2016/17; blue line/hatched area = previous 5-year mean/range.

National trends

A concise summary of how the UK's most familiar waterbirds fared in 2016/17.

WeBS annual species indices, with smoothed trends, are available as a download and plotted in the WeBS Report Online for all waterbird species with sufficient data. Table 1 contains 25- and 10-year trends for the most abundant waterbird species. Here we highlight some of the latest index and trend figures.

GEESE & SWANS

The Whooper Swan index has now been within 5% of the same value since 2010/11 and the Mute Swan index has stabilised at 8% lower than the 1998/99 –2011/12 period. The Svalbard Barnacle Goose index was the highest ever but the Pink-footed Goose index was slightly lower than 2015/16; these two species are strongly on the up with 25-year trends of 234% and 138% respectively. The Dark-bellied Brent Goose index was 22% lower than the most recent peak in 2014/15 but the 10-year trend is positive at +27%.

DUCKS

Gadwall has a 25-year trend of +144%, but is now showing signs of stabilising, with little change to the index value over the past five years. Teal (see page 30) and Shoveler continue to increase with record high indices but Mallard continue their decline with another record low. Pintail, another declining species, had a good year with the 2016/17 index 28% higher than 2015/16; this was the highest value since 2008/09, partially due to high counts in October. After a decade of lower values, the index for Wigeon was the second highest ever, only surpassed back in 2005/06.

The downward trend in Pochard shows no signs of abating, with yet another record low index value and a 25-year trend of -69%. Goldeneye is also continuing to decline with its 25-year trend of -58% and the lowest index value since 1979/80.

Common Scoter counts were very high at multiple coastal sites, resulting in a sharp increase in the index value to its highest ever level.

WADERS

Avocet and Black-tailed Godwit show strong long-term increases so it is no surprise both reached record high index values in 2016/17. Oystercatcher, Ringed Plover, Grey Plover, Knot, Redshank and Turnstone have negative 10-year and 25-year trends of between -12% and -57%, but index values were higher in 2016/17 than 2015/16 for all these species. Declines in Curlew, however, seem to be continuing: the index value was the lowest since 1985/86.

GULLS

The index values for all the main gull species were lower than in the previous year. Caution is always needed in interpreting gull data from WeBS Core Counts, as the methods are not ideal for this group. Bearing this in mind, ten-year trends are more mixed, from +414% for Mediterranean Gull, +28% for Herring Gull and +25% for Great Black-backed Gull, whereas the trends are negative for Common Gull (-39%), Lesser Black-backed Gull (-23%) and Black-headed Gull (-14%). In 2016/17, the latter three species also all had their lowest index values since gulls were added to WeBS in 1993/94.

OTHER WATERBIRDS

The divers have positive 10-year trends, whereas the grebes have negative 10-year trends, although the longer-term 25-year trends are positive for Little Grebe (+102%) and stable for Great Crested Grebe (+1%).

The 10-year trends for Moorhen (-26%) and Coot (-16%) are both negative. The Moorhen index has been fluctuating but stable for the past five years, whereas the Coot index was the lowest it has been since 1991/92.

The 2016/17 Little Egret index value was at a record high; its 10-year trend is +62%. Cormorant also reached a record high and a 25-year trend of +51%.

▲ **WeBS trend for Mallard in UK.**
Green dots = annual index; blue line = smoothed trend.

Table 1 Population trends of non-breeding waterbirds in the UK

Species/population	25-year trend (1990/91–2015/16)	10-year trend (2005/06–2015/16)	Species/population	25-year trend (1990/91–2015/16)	10-year trend (2005/06–2015/16)
n/a Mute Swan	27	-8	n/a Eider *	-30	-8
▼ Bewick's Swan	-77	-65	▼ Goldeneye	-58	-31
▲ Whooper Swan	145	38	▼ Red-breasted Merganser	-26	-20
▲ Pink-footed Goose	138	75	▼ Goosander	-7	9
▲ European White-fronted Goose	-57	-8	n/a Ruddy Duck	-100	-100
▼ Greenland White-fronted Goose	-31	-26	▼ Little Grebe	102	-2
▲ Icelandic Greylag Goose	-8	7	▼ Great Crested Grebe	1	-20
n/a British Greylag Goose	146	31	▼ Cormorant	51	10
n/a Canada Goose	58	12	▼ Coot	1	-16
▲ Greenland Barnacle Goose	159	46	▼ Oystercatcher	-28	-14
▲ Svalbard Barnacle Goose	234	59	▲ Avocet	600	44
▼ Dark-bellied Brent Goose	5	27	▬ Ringed Plover	-58	-35
▲ Canadian Light-b. Brent Goose	47	30	▼ Golden Plover	72	-28
▲ Svalbard Light-b. Brent Goose	36	-14	▬ Grey Plover	-41	-29
▼ Shelduck	-33	-23	▼ Lapwing	-14	-35
▼ Wigeon	27	-10	▬ Knot	-20	-16
▲ Gadwall	144	19	▲ Sanderling	24	0
▬ Teal	40	12	▬ Purple Sandpiper	-55	-6
▬ Mallard	-40	-15	▼ Dunlin	-44	-13
▼ Pintail	-30	-40	▲ Black-tailed Godwit	248	25
▼ Shoveler	76	10	▲ Bar-tailed Godwit	-13	13
▼ Pochard	-69	-44	▼ Curlew	-20	-13
▼ Tufted Duck	4	6	▬ Redshank	-18	-14
▬ Scaup	-21	-55	▲ Turnstone	-48	-29

Trends are % changes, for the most abundant waterbirds.

The longer term smoothed trend refers to the 25 year period 1990/91 to 2015/16. The shorter term smoothed trend refers to the 10 year period 2005/06 to 2015/16. It is customary to calculate trends to an end-point of year (n-1) (where n = 2016/17).

Preceding each species is an indication of flyway population trend, based on: Nagy, S., Flink, S. & Langendoen, T. 2015. *Sixth AEWA Report on the Conservation Status of Migratory Waterbirds in the Agreement Area*. Wetlands Int., NL. ▲ increasing, ▼ decreasing, ▬ stable, **n/a** not applicable as population is non-native (Canada Goose, Ruddy Duck) or non-migratory (Mute Swan, British Greylag Goose and Eider*)

*Eider trends exclude birds on Shetland (of *faeroeensis* race).

Trends use WeBS data except for Pink-footed Goose, Greenland White-fronted Goose, Icelandic Greylag Goose, Greenland Barnacle Goose, Svalbard Barnacle Goose and Canadian Light-bellied Brent Goose, for which dedicated censuses are undertaken (see page 5).

For all trend graphs see the online report...

www.bto.org/webs-reporting

Mallard down 40% since 1990/91.

TERESA FROST

Largest waterbird aggregations

Millions of waterbirds are dependent on the UK's wetlands each winter.

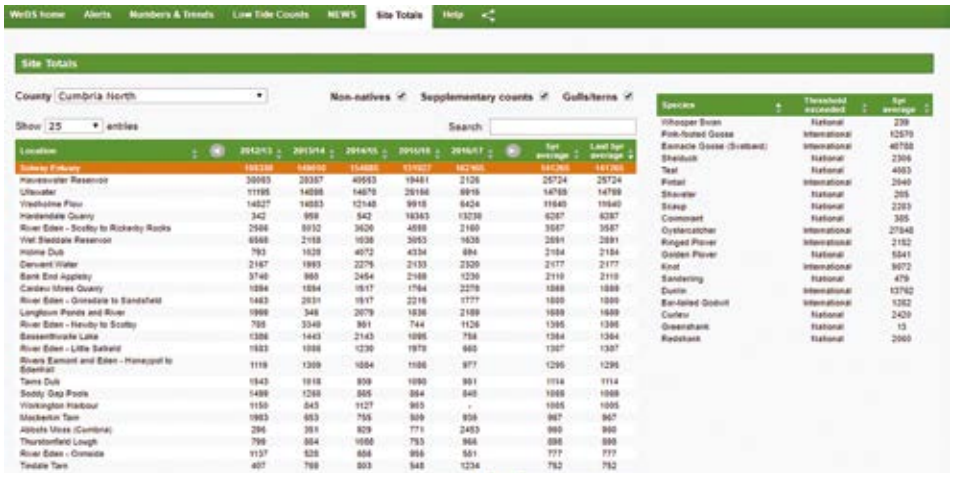
WeBS site totals indicate which sites support the largest aggregations of waterbirds each year. Understanding precisely how many individual birds use a site is clearly very difficult to ascertain from counts alone, as many sites are used by migrants on passage and consequently there can be high turnover rates.

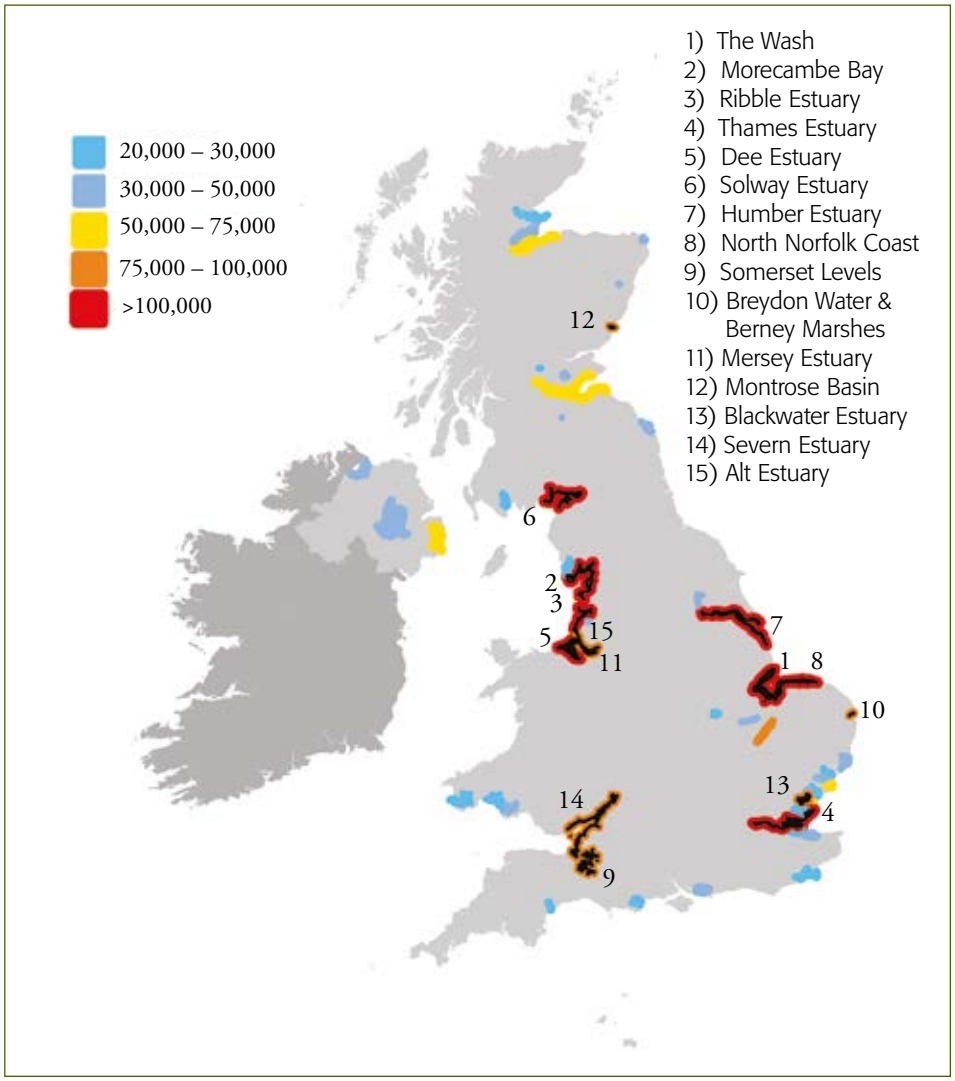
Table 2 lists the Principal Sites for non-breeding waterbirds. The totals are the summed counted maxima for each species during the course of the WeBS year (missing counts are not imputed; supplementary counts are included). Sites with a five-year average of 20,000+ waterbirds are listed. Non-native species (e.g. Canada Goose and Ruddy Duck) have been excluded from the totals. Although an important component of a site's waterbird fauna, gulls and terns are also excluded, since the recording of them during WeBS Counts is optional.

From this edition of Waterbirds in the UK, it is possible to view the totals for all WeBS sites via the new WeBS Online Report 'Site Totals' tab. In the interactive table of sites non-native species, gulls and terns and supplementary counts can be included or omitted as desired by the user and either all sites in a county or just the major sites with over 1,000 birds listed. Selecting a site will show the species for which that site holds more birds than the national or international importance threshold.

SITE FOCUS

The WeBS site definition of the Solway Estuary has been changed compared to previous reports to more closely relate to the Solway SPA. The adjacent major roost sites of Caerlaverock and Mersehead have been incorporated and the count sectors of the outer Cumbrian Solway have been moved to a new coastal site "St Bees Head to Mawbray".





▲ **Top - Screenshot of new Sites Totals page on the Online Report. Bottom - Sites with largest waterbird aggregations in the UK.**

Table 2 Principal Sites for non-breeding waterbirds in the UK

Site	2012/13	2013/14	2014/15	2015/16	2016/17	5-year mean
The Wash	350,031	393,260	343,932	345,348	417,457	370,005
Morecambe Bay	191,056	181,689	171,968	184,518	205,351	186,916
Ribble Estuary	178,318	174,200	171,680	161,580	178,801	172,915
Thames Estuary	179,961	194,525	173,262	141,452	133,602	164,560
Dee Estuary (England and Wales)	151,290	124,605	136,507	146,277	166,413	145,018
Solway Estuary	114,898	137,216	148,849	124,584	155,524	136,214
Humber Estuary	128,117	129,926	113,202	130,628	165,763	133,527
North Norfolk Coast	121,563	153,507	121,202	106,257	150,363	130,578
Somerset Levels	93,386	88,701	102,726	122,180	90,205	99,439
Breydon Water and Berney Marshes	96,523	88,857	91,413	114,626	102,553	98,794
Mersey Estuary	63,412	89,102	85,422	107,271	111,970	91,435
Montrose Basin	77,551	61,718	98,098	101,538	112,010	90,183
Blackwater Estuary	66,111	83,696	91,090	82,988	102,847	85,346
Severn Estuary	75,151	74,834	71,524	92,112	98,802	82,484
Alt Estuary	87,950	78,759	73,792	87,308	83,835	82,328
Ouse Washes	63,088	101,941	75,902	87,704	65,172	78,761
Forth Estuary	76,301	59,353	77,236	79,917	76,446	73,850
Strangford Lough	60,811	65,256	46,204	60,700	62,830	59,160
Hamford Water	63,372	62,228	52,570	46,142	49,617	54,785
Dengie Flats	45,021	55,842	46,460	62,344	63,093	54,552
Inner Moray and Beauly Firths	42,359	46,548	43,292	59,748	75,213	53,432
Swale Estuary	57,012	36,578	29,573	59,054	62,807	49,004
Stour Estuary	44,520	48,566	52,699	54,283	42,780	48,569
Chichester Harbour	41,661	47,518	50,207	42,242	46,844	45,694
Loch of Strathbeg	39,589	29,411	73,013	43,837	41,352	45,440
Loughs Neagh and Beg	45,100	46,828	49,043	38,345	41,890	44,241
Lindisfarne	36,519	30,334	44,048	41,831	59,537	42,440
Loch Leven	38,542	62,335	35,861	34,530	39,852	42,224
Cromarty Firth	38,110	34,493	36,296	43,413	56,092	41,680
Burry Inlet	47,270	29,984	47,103	44,265	33,695	40,463
Loch of Skene	35,988	30,146	50,649	33,349	35,969	37,220
WWT Martin Mere	26,672	41,861	31,340	45,859	44,312	37,208
West Water Reservoir	20,254	28,200	29,600	83,148	15,300	35,300
Lower Derwent Ings	29,914	27,911	34,686	35,647	41,267	33,885
Lough Foyle	31,677	33,973	30,187	32,046	35,317	32,640
Abberton Reservoir	23,725	35,059	37,613	32,911	29,780	31,818
Alde Estuary	31,011	32,988	36,646	25,774	29,810	31,245
Nene Washes	24,812	27,718	26,037	34,682	42,795	31,208
Langstone Harbour	30,025	32,217	27,957	29,091	31,534	30,164
Dornoch Firth	25,925	24,639	30,383	24,851	36,479	28,455
Medway Estuary	14,589	28,876	22,481	32,471	42,499	28,183
Colne Estuary	30,213	26,889	41,136	23,525	16,507	27,654
Dungeness and Rye Bay	28,886	29,076	25,432	25,444	26,663	27,100
Crouch-Roach Estuary	22,881	24,595	29,958	24,311	30,337	26,416
Carsebreck and Rhynd Lochs	24,260	23,051	25,265	26,841	22,806	24,444
Carmarthen Bay	26,519	21,347	30,646	20,475	19,739	23,745
Poole Harbour	23,272	22,807	24,673	21,264	26,184	23,640
Orwell Estuary	22,155	24,776	26,121	22,249	18,084	22,677
Exe Estuary	19,154	22,003	22,368	24,806	23,930	22,452
Duddon Estuary	18,723	19,028	25,395	19,473	28,134	22,150
Rutland Water	16,539	28,702	18,537	22,521	24,274	22,114
Cleddau Estuary	17,902	20,833	16,414	20,905	30,766	21,364
Wigtown Bay	15,735	21,284	20,406	21,843	22,228	20,299

- Totals are the sum of species maxima during the WeBS-year at each site, using data from all months. This summary does not account for missed visits or reduced coverage.
- Some totals may differ slightly from those published in previous annual WeBS reports due to late or amended data.
- Non-native species (such as Canada Goose and Ruddy Duck), are excluded, as are gulls and terns due to incomplete coverage.
- A more comprehensive table showing all sites is available online via **www.bto.org/webs-reporting-site-totals**

Delving into the data mine

Summary statistics from 70 years of waterbird monitoring in the UK.

The history of WeBS and predecessor schemes was highlighted in *WeBS News 33*. The WeBS database contains data from over one million Core Counts stretching back to the first year of the National Wildfowl Counts in 1947/48, although there are many paper forms from prior to 1966/67 still to digitise. A simple measure of the number of taxa recorded each year demonstrates changes to the scheme's scope, as more habitats and species groups were incorporated over time.

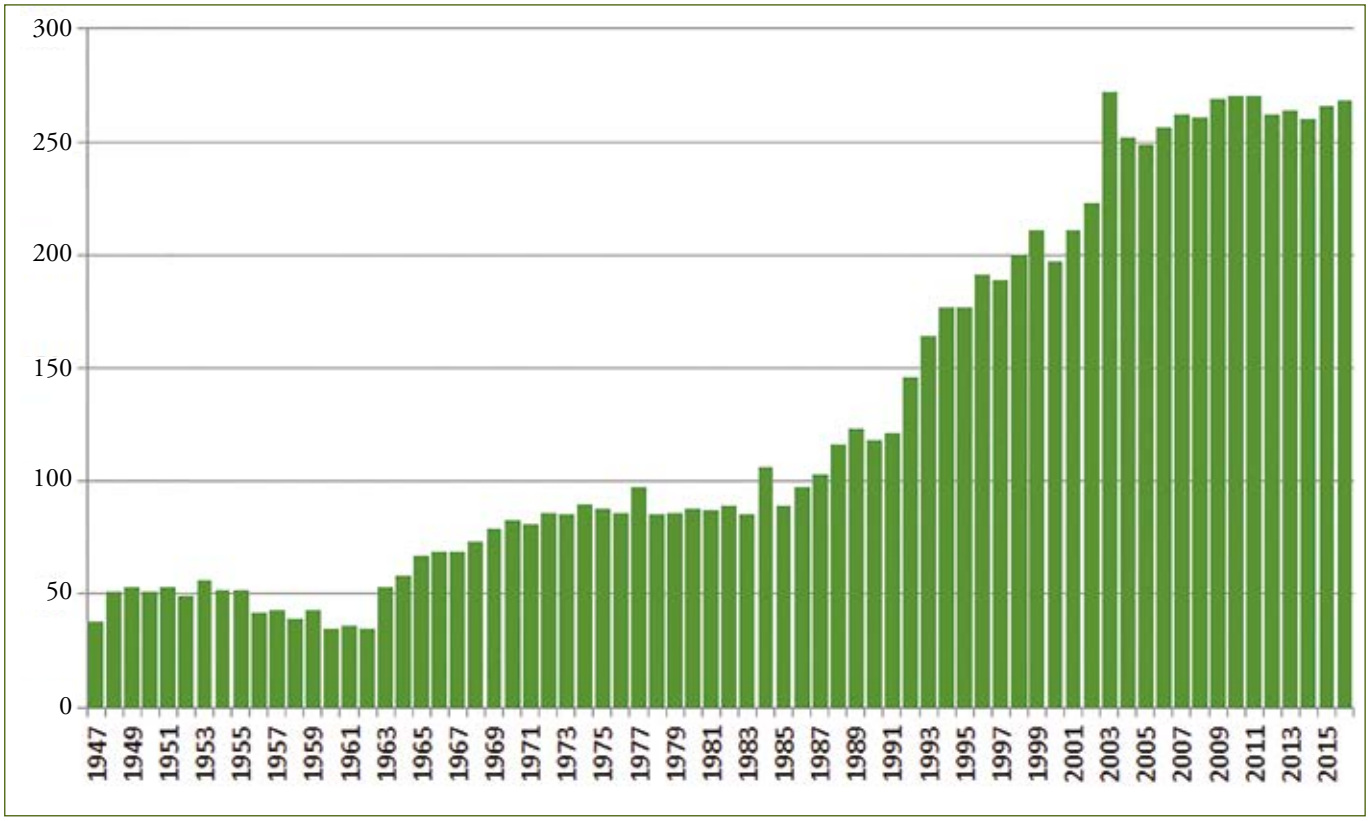
Mining a data source as rich and historical as that of WeBS is a fascinating exercise. The average number of birds on a site, given it occurs there, plotted against the total number of birds counted during the scheme, illustrates differences in aggregation behaviour. A continuum of strategies is revealed, from species such as Knot and Pink-footed Goose that occur on large numbers on relatively few sites, Mallard and Tufted Duck that occur in numbers on many sites, to Little Egret and Kingfisher that occur widely but never in large numbers.

Sum of all counts	
Dunlin	193,910,074
Oystercatcher	145,854,309
Knot	130,220,049
Wigeon	117,775,601
Mallard	71,610,594

▲ **Most numerous species by sum of all counts**

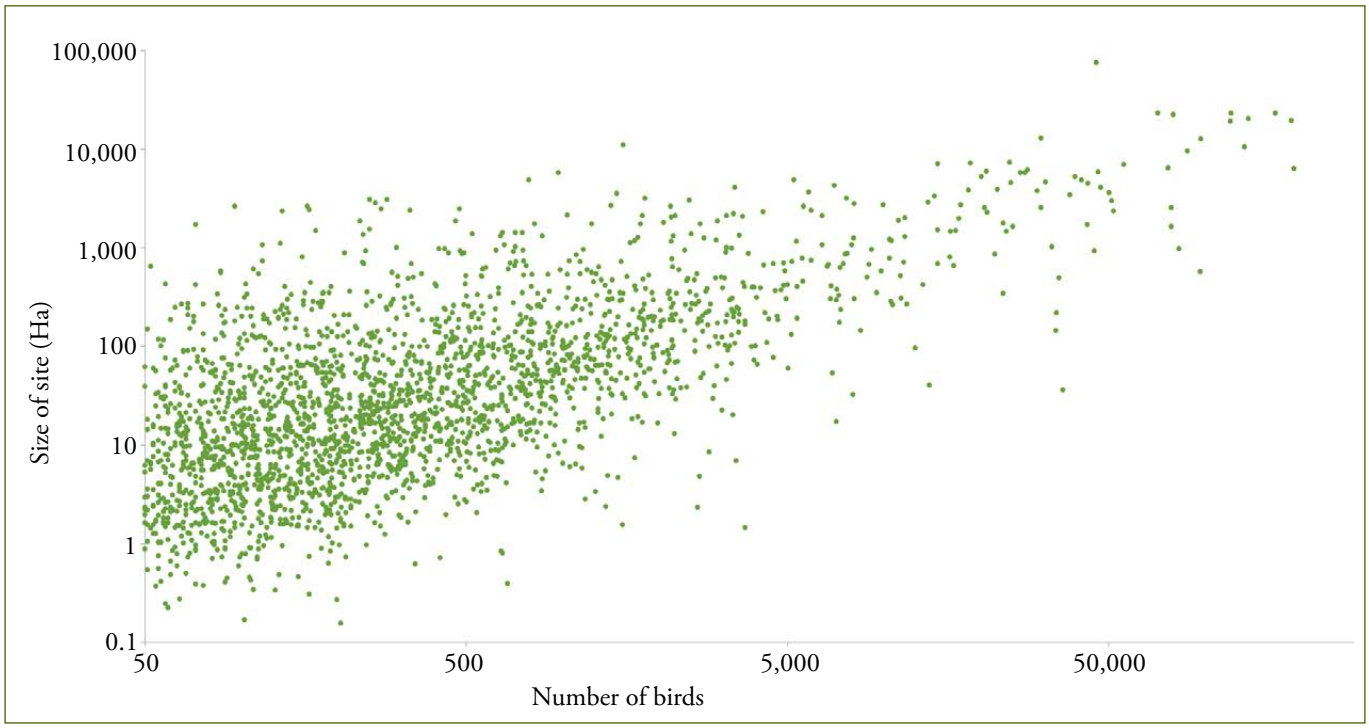
Total count sectors recorded on	
Mallard	10,580
Mute Swan	8,174
Teal	7,746
Tufted Duck	7,525
Cormorant	7,312

▲ **Most widespread species by number of sectors recorded on**

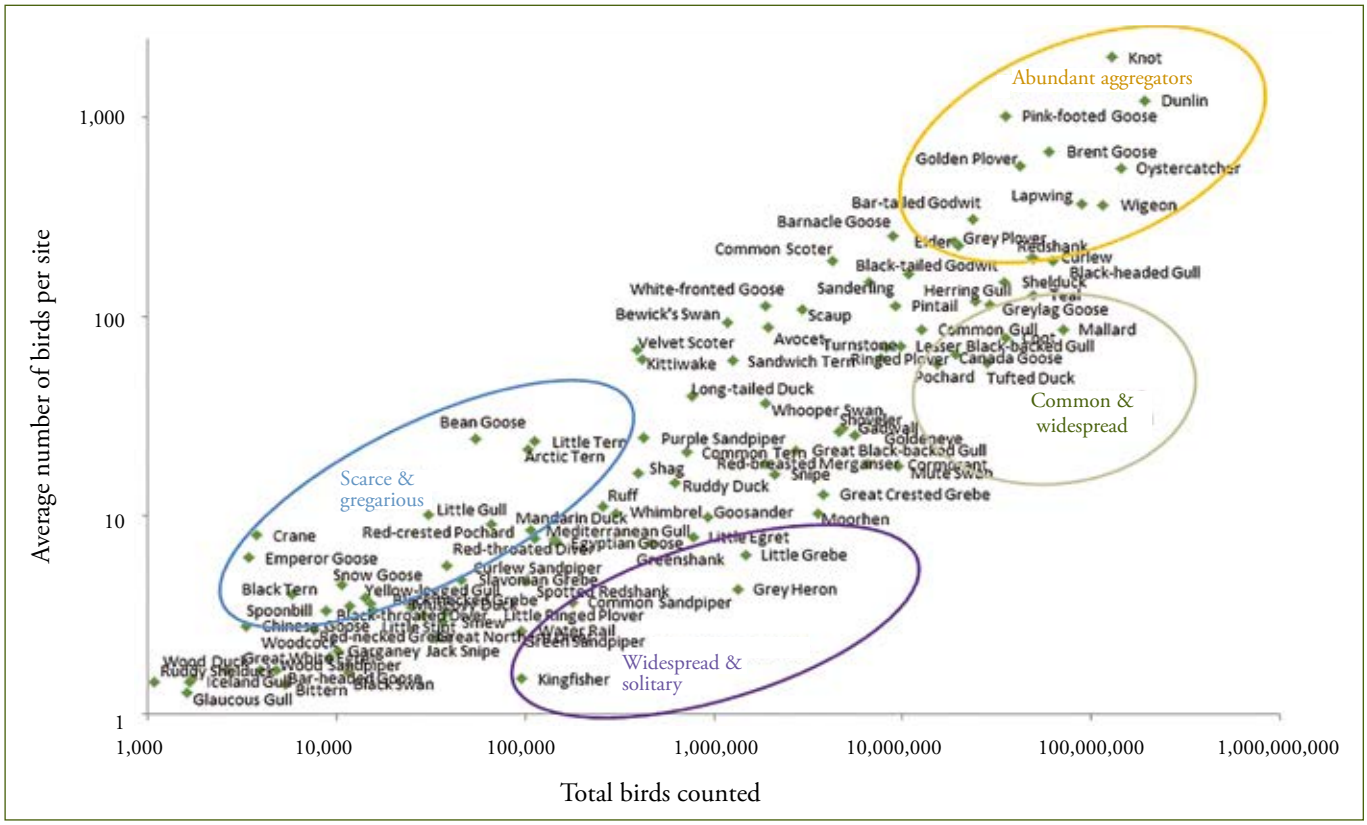


▲ **Number of different waterbird species (or races) recorded per year. Increases can be seen as the scheme has developed, with waders being included when the Birds of Estuaries Enquiry began in the late 1960s, other waterbirds such as grebes and divers added to the scheme in the 1980s and 1990s, and recording of non-natives and escapes encouraged in recent years.**

Comparing the total number of birds at a site and the size of the site, as calculated from the spatial boundaries stored in the WeBS database, suggests a relationship – with more birds on bigger sites, as might be expected. However, there is clearly much variation, demonstrating how exploring WeBS data serves to prompt ecological questions. Furthering our understanding of why some sites are more attractive to waterbirds than others may in future help improve waterbird population size and distribution estimates.



▲ **WeBS sites holding at least 50 waterbirds, plotted as size of site against number of birds; note log scale.**



▲ **Waterbird species plotted as the sum of all WeBS counts against the average number of birds per occupied site; note log scale.**

Reedbeds

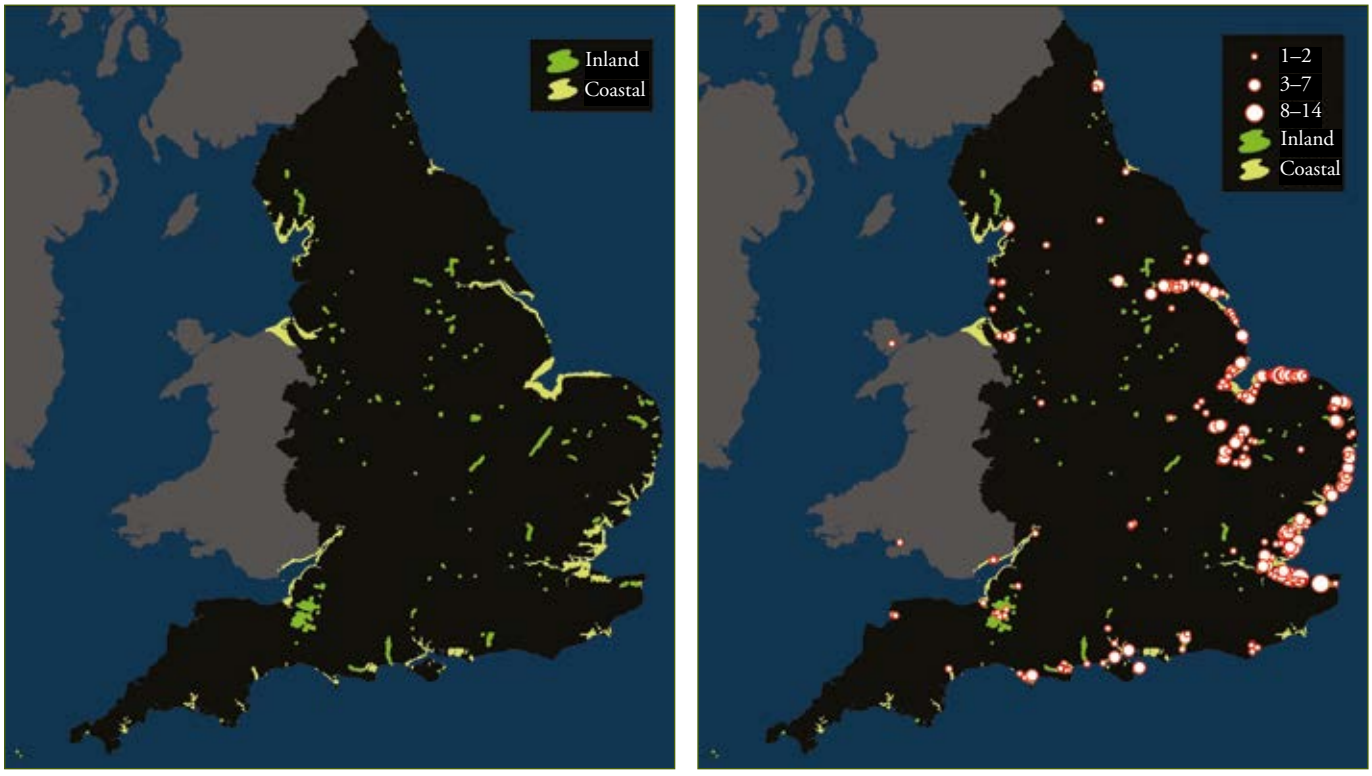
A look at reedbeds in the UK and three specialised species that use this habitat.

Reedbeds – that is, large areas dominated by stands of the Common Reed *Phragmites australis* – are an iconic component of European wetland habitat mosaics. Reed occurs throughout the UK on wetland edge, but large reedbeds are more frequent in southern Britain. Reedbeds can be a transition habitat to fen and carr, but this process can be held back, for example by cutting of reed for thatching, active habitat management or where regular flooding occurs, it is suggested that cloned stands can persist for 1,000 years.

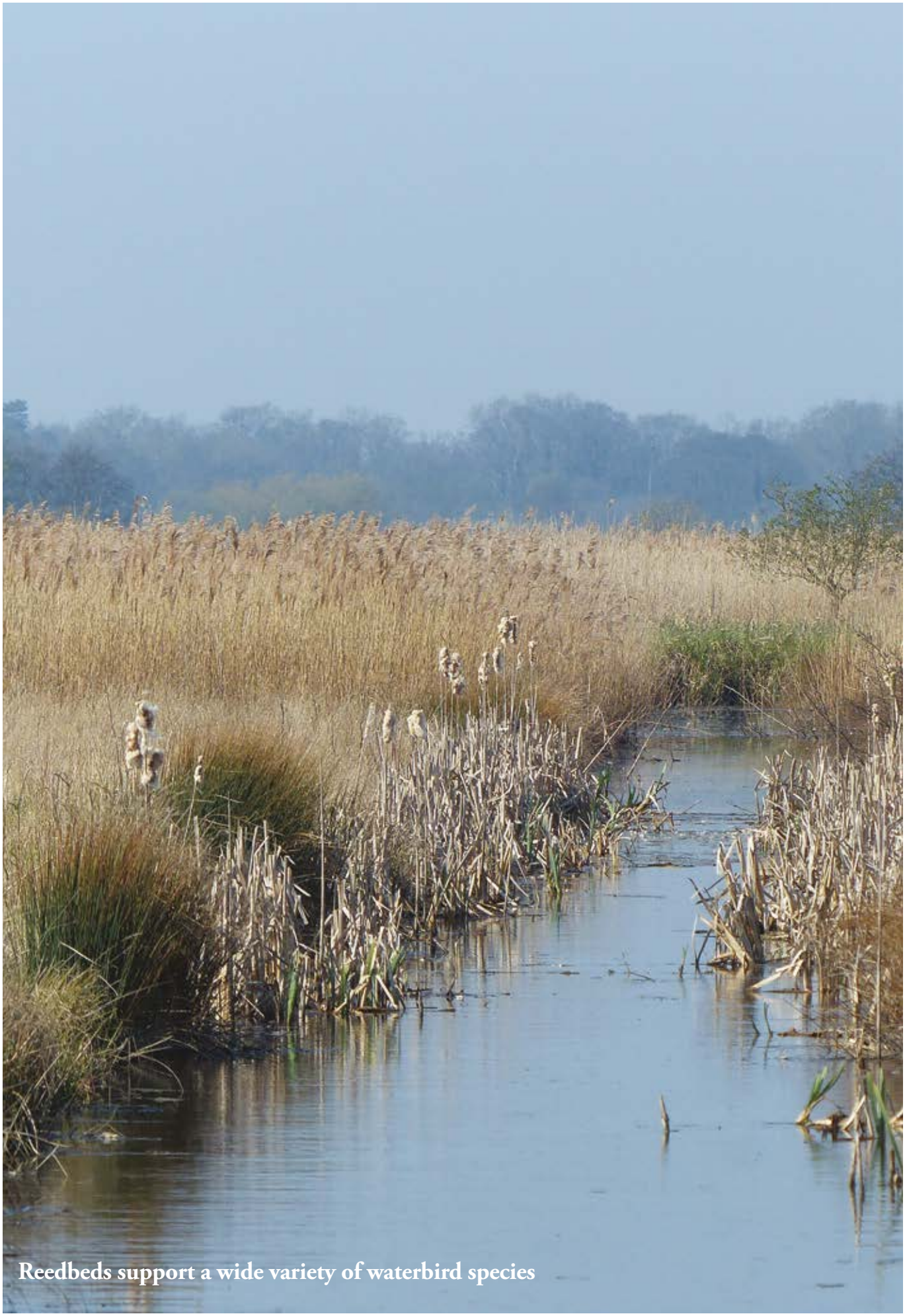
Conservation work in the UK that has focused on creating, restoring and managing reedbeds has been of benefit to waterbird species that appreciate the seclusion they offer during the breeding season and throughout the year, including Crane (*Waterbirds in the UK 2014/15*), Red-crested Pochard (see pages 22–23), Water Rail and rarer species such as Bittern, Purple Heron, Little Bittern, Great White Egret and Glossy Ibis. Garganey, Gadwall and Teal may not venture into densely vegetated stands, but benefit from areas of sheltered open water fringed by reeds, and feed along the edge of the beds and in stubble after reeds are cut.

Passerine and raptor bird species which specialise in this habitat include Reed Warbler, Bearded Tit and Marsh Harrier, and in winter extensive reedbeds provide attractive cover for Starling roosts. Although non-waterbirds such as these are not formally monitored by WeBS, counters may add counts of these wetland specialists to their WeBS visits for local site monitoring if so wished.

In contrast with open water habitats, waterbirds in reedbeds have low detectability and birds will be missed during WeBS Core Counts. Nevertheless, consistent counting at sites with reedbeds is important for monitoring key species of this wetland habitat.



▲ **English WeBS sites which contain at least one reedbed with area greater than 2-Ha, according to Natural England's Priority Habitat Inventory (left) and (right) with peak Marsh Harrier 2016/17 WeBS sector counts (note recording of this species is optional).**



Reedbeds support a wide variety of waterbird species

DAWN BALMER

BITTERN

Although not typically recorded on WeBS counts, Bitterns are now being seen, and heard, much more frequently at a number of wetlands across the country.

JILL PAKENHAM

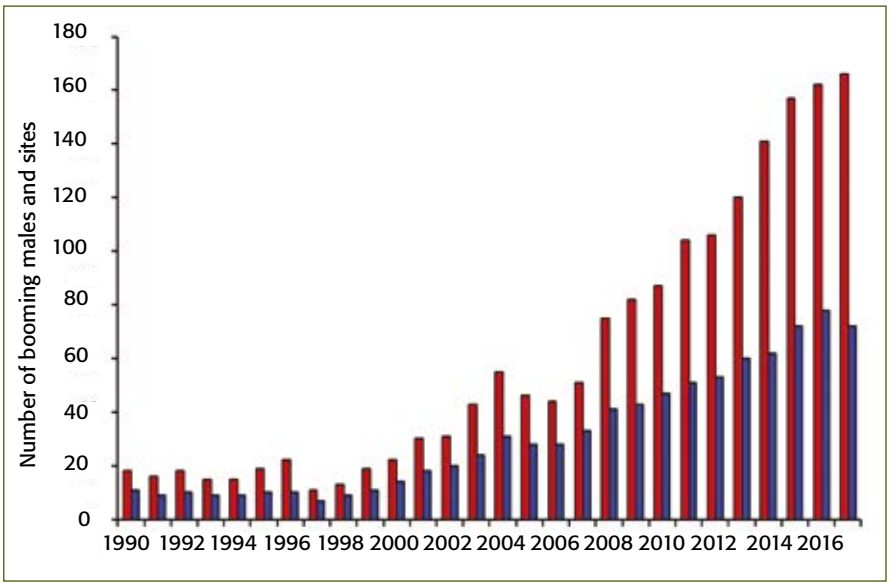
Once widespread and locally numerous across the lowlands of the UK, the Bittern had been extirpated as a breeding species by a combination of habitat loss and persecution by the late 1880s. Since recolonisation early in the 20th Century, Bitterns increased to a peak of about 80 booming males in the 1950s, mainly in the Norfolk Broads, but then fell to fewer than 20 by the 1990s, with similar declines witnessed in many other countries in Western Europe. By 1997, there were only eleven booming male Bitterns in the UK; these were mainly in Norfolk and Suffolk, with a small outlying population at Leighton Moss, Lancashire.

From the mid 1990s, there was concerted conservation action to restore larger reedbeds which still contained Bitterns and those from which the birds had most recently been lost, and to create suitable new reedbeds, supported by detailed research that identified the key factors affecting reedbed use by male and female Bitterns (summarised in Brown *et al.* 2012). To date, Bittern numbers have responded well, though work continues to refine our knowledge and to identify the benefits to other wildlife of management aimed at further increasing Bittern numbers and productivity. But the future of Bitterns in the UK is far from secure, with climate change, through sea-level rise and drying in the southeast, threatening to undermine much that has been achieved.

There has been a full survey of the British breeding population in every year since 1990. The aim of the annual survey has been to count the total number of booming male Bitterns in Britain, and since 1994 the number of active nests. Major wetland habitat management, habitat restoration and creation are ongoing for this species and annual population monitoring is the main yardstick with which we can measure its success. The RSPB coordinates Bittern monitoring across the country, through the Bittern Monitoring Programme, an *Action for Birds in England (AfBiE)* project with Natural England. The annual monitoring is mainly conducted with the help of many volunteers, conservation site staff and landowners, for which we are very thankful.

Records of booming Bitterns should be submitted to the local county bird recorder, who will make an annual submission to the Rare Breeding Birds Panel (RBBP).

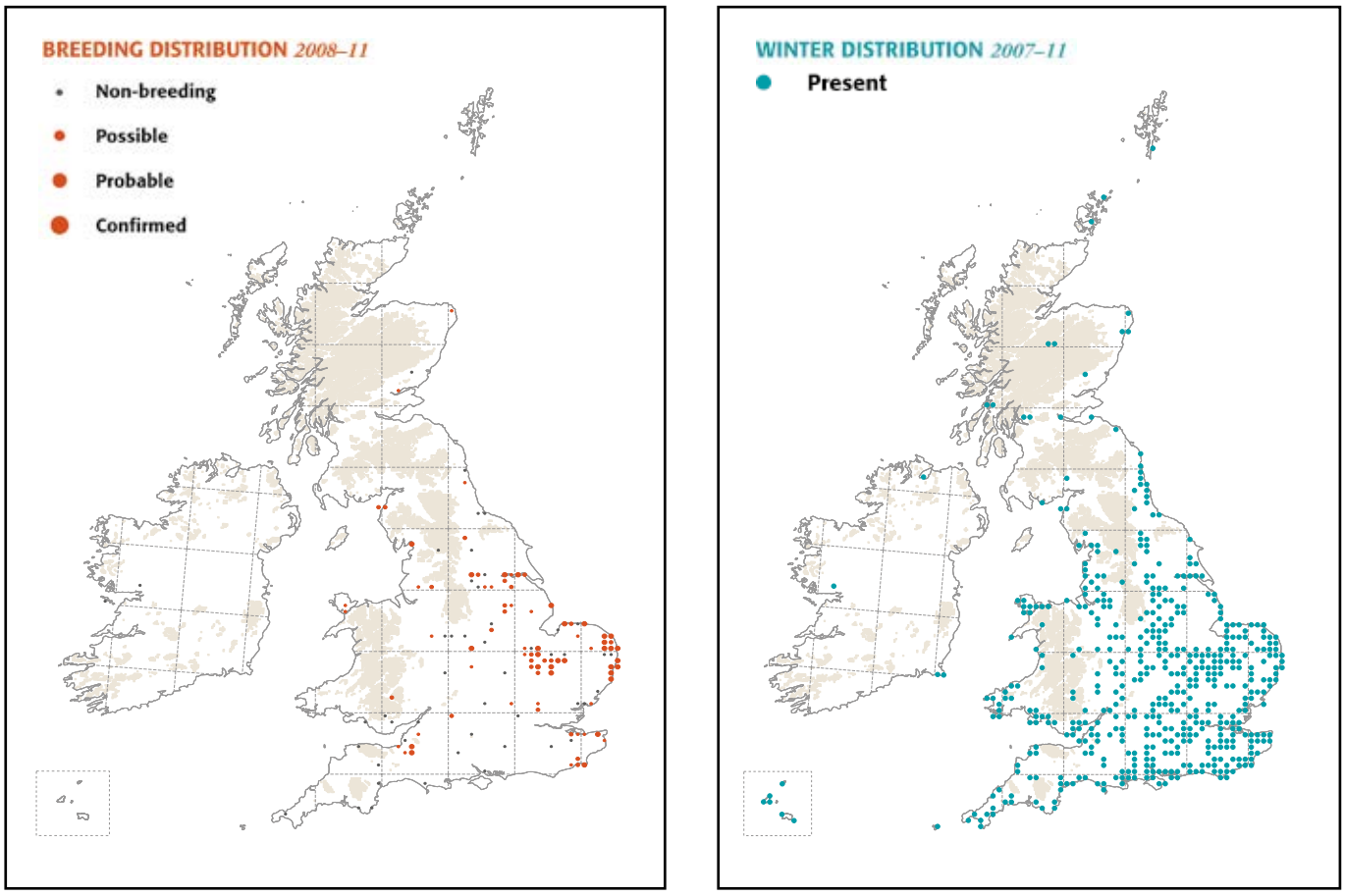
Breeding Bitterns in the UK have shown a strong recovery over the past 15 years, with a minimum of 166 booming males recorded in 2017 at 62 sites. Much of this increase has been on sites that were created in the mid 1990s, such as Lakenheath Fen in Suffolk and Ham Wall in Somerset, which has been the top site for booming Bitterns since 2011. Somerset was recolonised in 2008, when there were two booming males, both at Ham Wall; in 2016, there were 47 booming males in Somerset, with 21 at Ham Wall. As can be seen in the map opposite, the breeding distribution is predominantly still in the traditional counties of Norfolk and Suffolk. Since 1990, there has



▲ **The minimum number of booming males (red) in the UK and the number of occupied sites (blue) between 1990 and 2017.**

been confirmed booming at 150 sites in England and Wales.
From late summer onwards there is a regular influx of wintering Bitterns into the UK. It is thought that these birds migrate in a generally south-westerly direction, probably mainly from the Nordic and Baltic countries, where the populations are entirely migratory (Wernham *et al.* 2002). In recent years, increasing numbers of wintering Bitterns have been recorded at many sites in the UK, most of which do not currently support booming males. Bitterns are not necessarily restricted to extensive reedbeds in winter and can often be found in small wetlands with only small patches of *Phragmites*.

The WeBS maximum total for Bittern for 2016/17 was 35 birds, a small proportion of the population.Data on the UK winter population were last collated in 2009/10, when a minimum of 600 birds were recorded from nearly 400 sites (Wotton *et al.* 2011). As the UK breeding population is largely resident, it is possible to calculate the number of resident birds from the breeding survey data. It was estimated that the winter population in 2009/10 included 208 resident birds, based on the 2009 breeding data. From the 2017 breeding season, the current estimate of resident Bitterns in the UK during the 2017/18 winter is 417 birds, following the same calculations in Wotton *et al.* (2011).



▲ **Distribution maps from Bird Atlas 2007–11 (Balmer *et al.* 2013) highlight the difference in Bittern breeding (left) and wintering (right) distributions.**

FIND OUT MORE...

Balmer, D.E., Gillings, S., Caffrey, B.J., Swann, R.L., Downie, I.S. & Fuller, R.J. (eds). 2013. *Bird Atlas 2007–11: the breeding and wintering birds of Britain and Ireland*. BTO Books, Thetford.

Brown, A., Gilbert, G. & Wotton, S. 2012. Bitterns and Bittern Conservation in the UK. *British Birds* **105**, 58–87.

Wernham, C. V., Toms, M. P., Marchant, J. H., Clark, J. A., Siriwardena, G. M., & Baillie, S. P. (eds). 2002. *The Migration Atlas: movements of the birds of Britain and Ireland*. Poyser, London.

Wotton, S., Grantham, M., Moran, N. & Gilbert, G. 2011. Eurasian Bittern distribution and abundance in the UK during the 2009/10 winter. *British Birds* **104**, 636–641.

WATER RAIL

Water Rail is one of the least detectable of our waterbird avifauna; its skulking, elusive habits making it a challenge to monitor effectively at any time of year. Often it is only its unusual, squealing call that calls attention to its presence but sometimes one can be seen fluttering over the reeds with dangling legs or venturing into the open, especially in freezing conditions.

Bird Atlas 2007–11, BirdTrack and WeBS counts suggest that it is more widespread and numerous during winter, which is to be expected, as ringing recoveries suggest British birds are joined by birds from the Netherlands, Belgium and Germany and as far as Belarus. The WeBS trend suggests stability and numbers are largest in October – December. WeBS sites with a five-year peak mean of 20 birds or more are Severn Estuary, Somerset Levels, Wigan Flashes, Southampton Water, Malltraeth RSPB and Thames Estuary.

Playback of calls can be used to get a more complete idea of the number of birds using the site. At Wigan Flashes, the peak wintering number of Water Rail recorded from the reedbeds increased from six to 20 using this method (Smith, 2012), and during a trial at six WeBS sites, tape luring increased counts tenfold from seven to 78 (Calbrade, 2014). To keep Core Counts methodology consistent, to avoid biasing annual or monthly indices at sites where the audio playback method is not used during every Core Count visit, the number of birds counted without playback should be submitted as the Core Count. Any responses to playback should be submitted as a supplementary or casual count.

FIND OUT MORE...

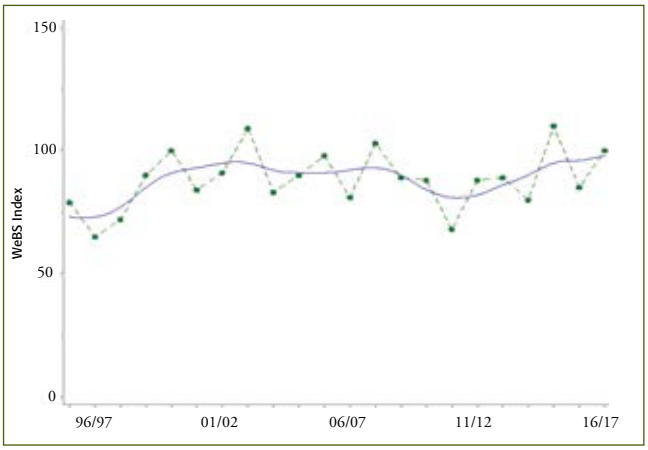
Smith, J. 2012. Exposing the squealers. *WeBS Newsletter* **28**: 13.

Calbrade, N. 2014. Water Rail Survey Update. *WeBS Newsletter* **30**: 12.

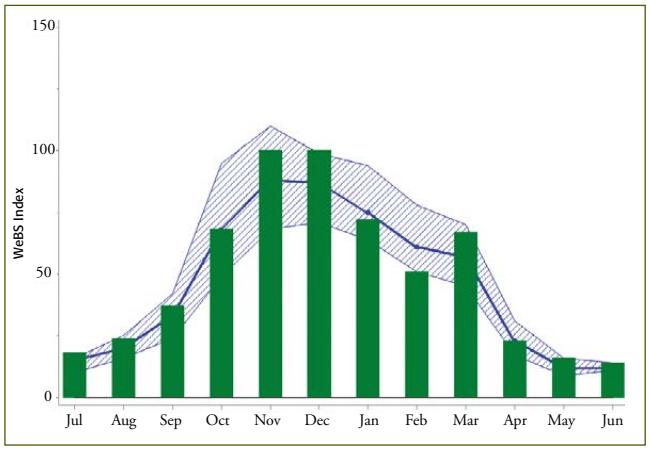
Table 3 Important WeBS sites for Water Rail

Site	2012/13	2013/14	2014/15	2015/16	2016/17	Month	5-year mean
Severn Estuary †	84	97	59	22	25	Nov	57
Somerset Levels	37	61	45	45	47	Mar	47
Wigan Flashes	19	33	29	20	28	Mar	26
Southampton Water	13	20	(32)	25	(15)	Nov	23
Malltrath RSPB †	20	29	19	22	15	Nov	21
Thames Estuary	26	24	29	12	10	Jan	20
Cotswold Water Park	10	12	9	17	26	Dec	15
Rutland Water	20	12	14	12	12	Jan	14
Dungeness and Rye Bay	19	15	7	16	8	Oct	13
Chew Valley Lake	21	6	6	12	17	Nov	12
Humber Estuary †	4	6	14	18	14	Jan	11
Doxey Marshes SSSI	6	7	(20)	10	12	Nov	11
Cosmeston Lakes †	32	3	17	0	2	Nov	11
Lee Valley Gravel Pits	7	9	11	(15)	11	Nov	11
Hatfield Moors	-	-	8	(13)	-		11
Ingrebourne Valley	8	11	10	-	-		10

• Annual peaks and month in 2016/17 when recorded are shown. Brackets indicate incomplete coverage. Five-year mean is for period 2012/13 to 2016/17.
† = Counts include supplementary data.



▲ **WeBS trend for Water Rail in UK.**
Green dots = annual index; blue line = smoothed trend.



▲ **Monthly indices for Water Rail in UK.**
Green bars = 2016/17; blue line/hatched area = previous 5-year mean/range.

GARGANEY

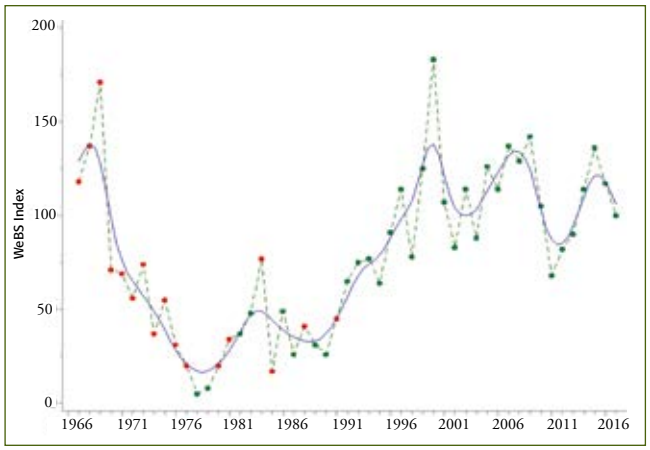
The Garganey is not a typical duck in the UK, as, uniquely, it is a summer visitor to our wetlands. In winter, aggregations of up to 70,000 may be found in the wetlands of West Africa, but here in the UK it is unusual to see more than a handful at any one site. It is estimated that around 100 pairs breed in the UK each year. Garganey like sites with shallow water and abundant fringing vegetation. Many of the WeBS sites they frequent have reedbeds as part of their wetland habitat mosaic, but they also may be found on marshlands and wet meadows.

DAVE KING

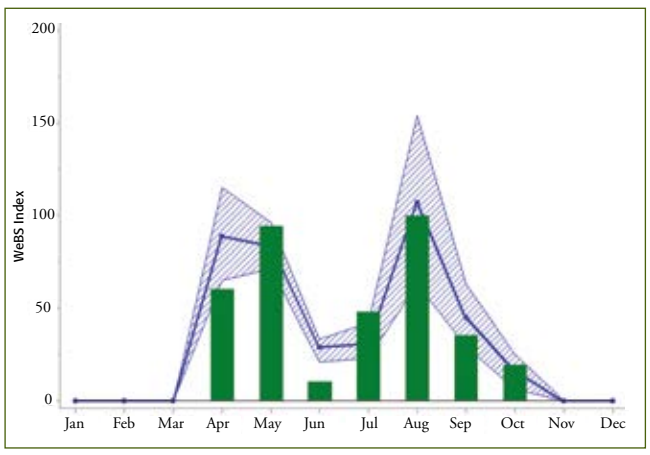
The WeBS trend for Garganey is based on summer data and is calculated for calendar years rather than WeBS years. Prior to 1990 there is uncertainty about the index due to counts from relatively few sites, but the trend since 2000 (although still based on a small number of counts) appears to be fluctuating but stable; the ten-year trend is -4%.

Bird Atlas 2007–11 showed the East Anglian fens to be a stronghold for this species. Ouse Washes is not regularly counted for WeBS during summer, but numbers there can be high – a supplementary count of Garganey for this site was an impressive autumn gathering of 127 in August 2012, and five birds were present there in April 2016. Other sites with a five-year mean of four birds or more are Fairburn Ings, Severn Estuary, Forth Estuary, Stodmarsh and Tophill Low Reservoirs. Occasionally birds are recorded late into autumn or during winter.

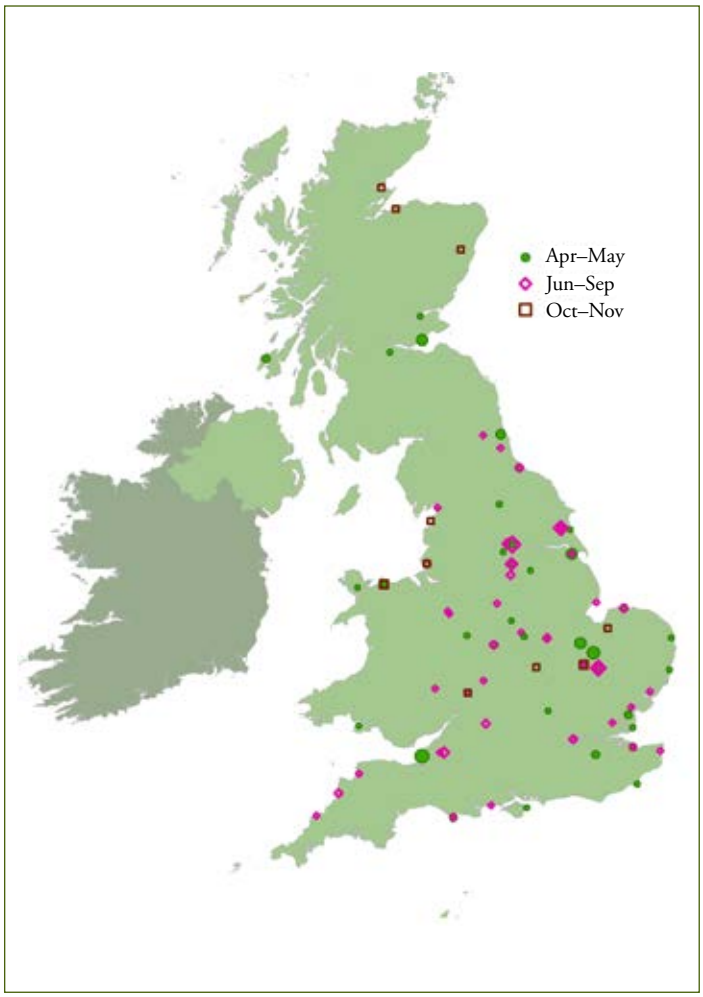
Garganey is a rare breeding and passage bird in Ireland, and the only Northern Ireland WeBS site that has ever had counts for this species is Loughs Neagh and Beg.



WeBS trend for Garganey in UK.
Green dots = annual index; red dots = sparse data; blue line = smoothed trend.



Monthly indices for Garganey in UK.
Green bars = 2016/17; blue line/hatched area = previous 5-year mean/range.



2016 Garganey WeBS counts. Symbol size relates to the count.

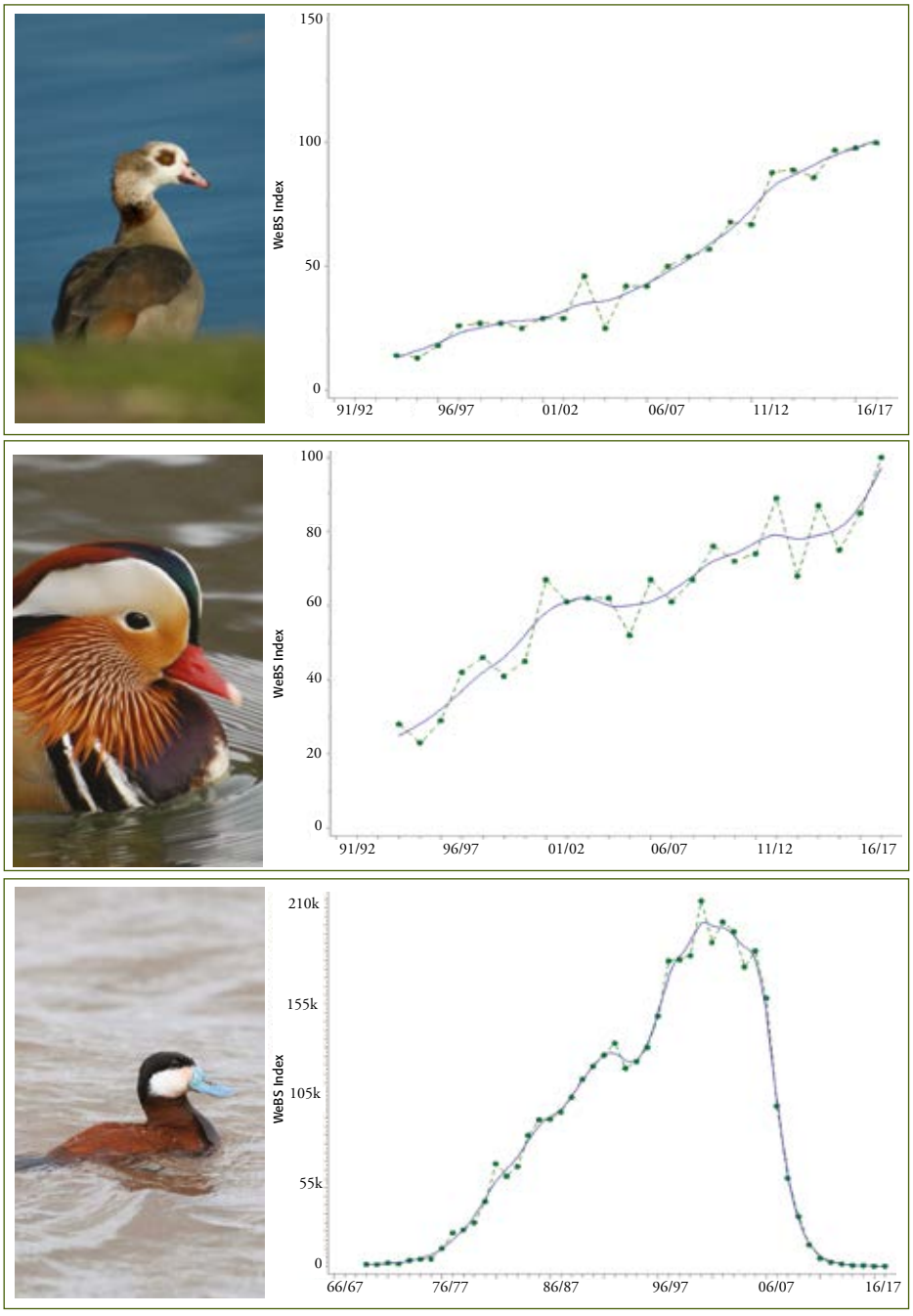
Illegal aliens

Many non-native species of waterbird have now become established in the UK, the impacts of which are being investigated.

WeBS plays an important role in monitoring the establishment of new waterbird populations, including non-native species that originated from wildfowl collections but have since established breeding populations and become, in some cases, a very familiar component of our wetland avifauna.

In 2016/17 the Egyptian Goose index reached another record high and is increasing rapidly, with a 10-year trend of +128%. It is expected that the population will continue to expand, as it has in The Netherlands and Germany, albeit at a slower rate here than on the continent. In the Netherlands the breeding population increased by an average of 28% per annum from 1967 until 1999, when it is thought saturation of breeding sites and increased culling stabilised the population (Gyimesi & Lensink 2012).

Mandarin Duck also reached a record high in 2016/17 but is not increasing quite as quickly as Egyptian Geese: it has a 10-year trend of +43%. Although the native range is in east Asia, bones from 600,000 years ago that seem to belong to this species have been found in Norfolk (Lever 2013). Its strongholds are well-wooded areas, including the Forest of Dean, the New Forest and Kielder Forest. There are also high concentrations in London and the Home Counties and the Peak District fringe. A secretive species, it forms flocks in winter and the highest WeBS core count peaks are at Brookleys Lake in Staffordshire (five-year mean 134) and Stratfield Saye in Hampshire (five-year mean 75).



▲ **WeBS indices for Egyptian Goose (top), Mandarin (middle) and Ruddy Duck (bottom).** Green dots = annual population index; blue line = smoothed trend.

Red-crested Pochard (2016/17 GB peak count of 559 in October) occurs in smaller numbers and on fewer WeBS sites than Egyptian Goose (1,339 in September) and Mandarin Duck (977 in January). The Red-crested Pochard index (10-year trend +57%) is influenced by numbers at Cotswold Water Park, where maximum counts have recently been lower than their 2011/12 peak of 432 birds (Table 4).

Increasing at a slower rate, the most widespread of the established non-natives is the Canada Goose. The 10-year UK trend is +12%, a noticeably slower rate than the latter decades of the 20th Century. The WeBS monthly index for Canada Goose varies little from month-to-month, except when the birds disperse and become less detectable when they breed in February – May. Canada Goose is still expanding in range; the Scottish population is increasing

Table 4 Top sites in the UK for Red-crested Pochard

Site	2012/13	2013/14	2014/15	2015/16	2016/17	Month	5-year mean
Cotswold Water Park	360	367	364	280	291	Jan	332
Lower Windrush Valley GPs	107	107	158	220	229	Nov	164
Sutton and Lound GPs	70	69	103	167	275	Oct	137
Hanningfield Reservoir	36	57	40	48	29	Jun	42
Serpentine and Long Water and Round Pond - Kensington	-	(3)	(28)	19	61	Aug	40

• Annual peaks and month in 2016/17 when recorded are shown. Brackets indicate incomplete coverage. Five-year mean is for period 2012/13 to 2016/17.

rapidly with a 10-year trend of +134% and a 25-year trend of +700%.

Non-native species can cause conflicts with conservation or other priorities. The outcomes of control measures can sometimes be seen in WeBS data at the site level or at the population level. For example, the UK WeBS index for Ruddy Duck documents its rise and fall as a result of the European-wide eradication program to protect the closely-related White-headed Duck in Spain and eastern Europe from hybridisation and competition.

Little is known about the effects on agriculture and aquatic ecosystems from expanding populations of Canada Geese and other non-natives. These established populations may affect native waterbird communities through competition for food. Where significant numbers of geese occur, these may alter the ecosystem through increased grazing pressure and the addition of nutrients to the water from droppings, causing knock-on effects on other species. These impacts are currently being examined in a joint project between BTO and CEH as a partnership with JNCC. Another large multi-organisational collaboration, entitled Hydroscape (funded by NERC), will use WeBS data to explore pathways of introduction and map hotspots of introduction, as well as examine how the spread of invasive species is related to the connectivity of the ecosystem and surrounding land-use.

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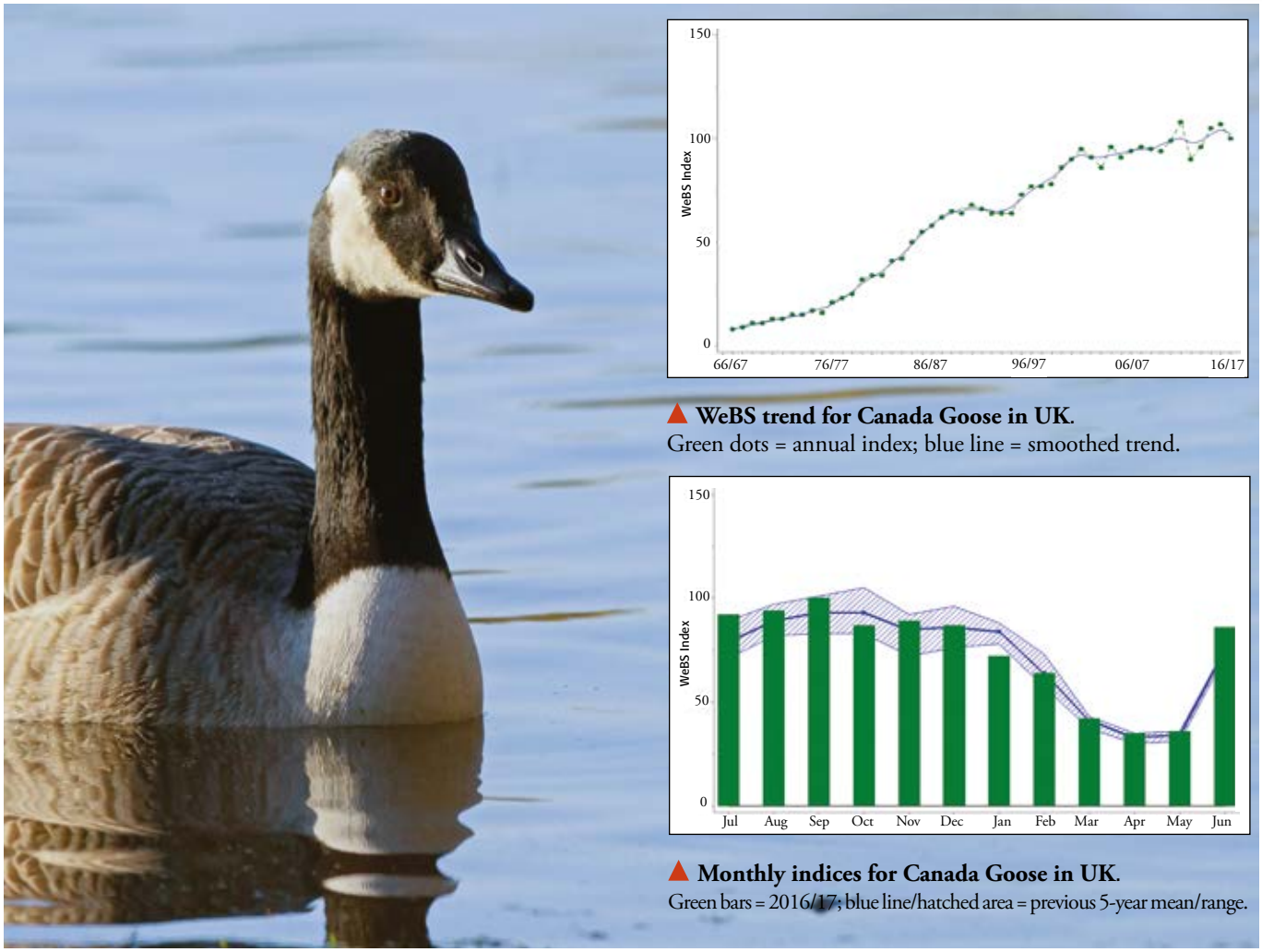


EGYPTIAN GOOSE BY NEIL CALBRADE; MANDARIN BY SARAH HARRIS; RUDDY DUCK BY CHRIS KNIGHTS AND CANADA GOOSE BY JOHN HARDING

▲ **WeBS trend for Canada Goose in UK.**
Green dots = annual index; blue line = smoothed trend.

▲ **Monthly indices for Canada Goose in UK.**
Green bars = 2016/17; blue line/hatched area = previous 5-year mean/range.

Christmas Waterbird counts in the Land of Ice and Fire

Kristinn H. Skarpédinsson (Icelandic Institute of Natural History) introduces the annual Christmas waterbird counts in Iceland.

Over 70% of Iceland's approximately 76 species of regular breeding birds are either full (24 species) or partial migrants (30 species). Every year, over 5 million waders leave the breeding grounds in Iceland for their wintering areas, ranging from Britain & Ireland to West Africa. Most of them either pass through Britain & Ireland or winter there. In addition, about 800,000 waterfowl migrate from Iceland annually, mostly to Scotland and Ireland, where their populations have been closely monitored for decades by thousands of volunteers. Many of the bird populations remaining in Iceland have also been kept under a close watch, based on a similar program and public support.

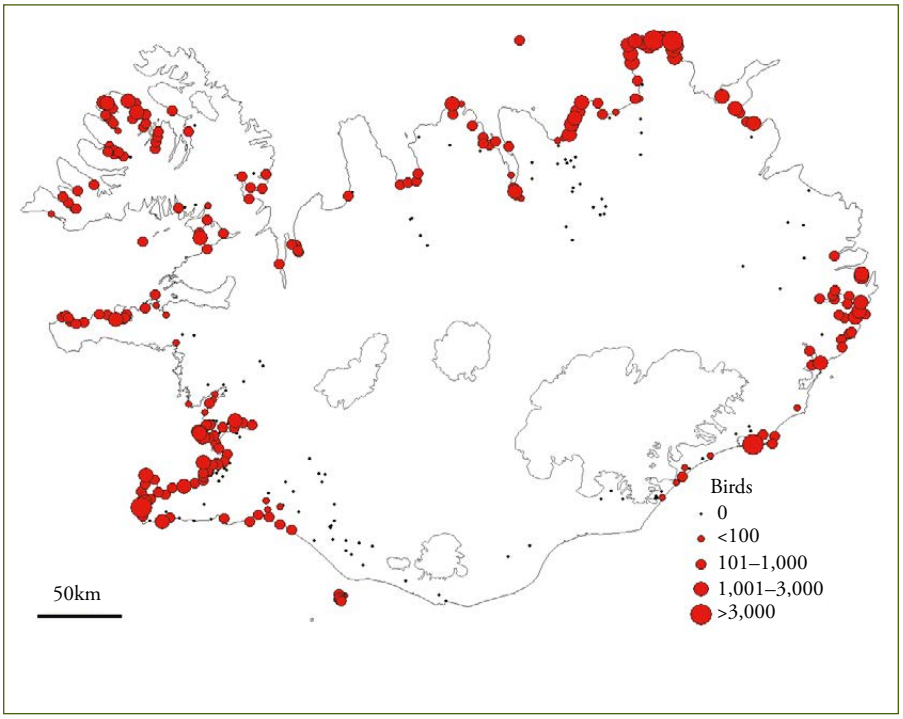
In 1952 M. Lorrimer Moe became the press attaché at the United States Embassy in Reykjavík, Iceland. Mr. Moe was an avid birder and a veteran of the Audubon Christmas Bird Counts – one of the longest-running community science project in the world. He soon got acquainted with Dr. Finnur Gudmundsson at the Icelandic Institute of Natural History (IINH), Iceland's only professional ornithologist. Finnur was a giant (6'7") and Moe later quipped that in a country where everybody looks on bird watching as something sissy, all the men with a real interest in birds are six-footers.

On winter solstice 1952 (December, 21st) Moe, Gudmundsson and twelve other bird watchers used the roughly four hours of daylight to visit ten sites and found a total of 33 bird species. This became an annual event and has gradually developed into nationwide winter bird monitoring program. Soon, the counts were set on either Boxing Day or the Sunday between Christmas and New Year's Day. Now, the official dates are the first, second or sometimes the third weekend after Christmas, set to avoid the ever growing and intimidating fire cracker frenzy around New Year's Eve.

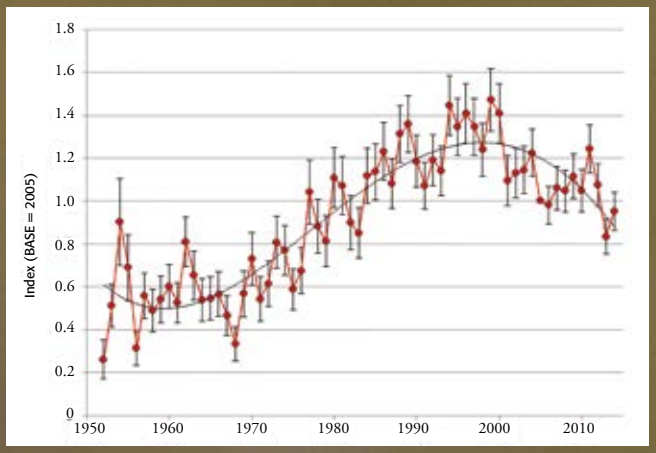
Currently, over 200 sites are monitored annually by more than 150 volunteers. Typically over 80 species are observed and approx. 200,000 individuals counted (https://www.ni.is/greinar/vetrarfuglatalningar-nidurstodur).

The Common Eider is usually by far the most common waterbird with 50,000 to 80,000 individuals. The Common Eider winter population in Iceland is estimated 850,000 birds, including some tens of thousands from NE-Greenland and Svalbard. Hence, 6–10% of the birds are encountered in the mid-winter counts.

The data set (through 2014) contains 5,485 counts from 358 sites in all regions in Iceland. Most counts (3,746) are coastal and covering 1,710 km of Iceland's 5,000-km coastline (34%). Several sites have been monitored annually since 1952, but some only once. The counts have been used to develop population indices for 20 of the most common species, including the Common Eider which has declined since the turn of the century and is now listed as Near threatened (NT) on the Icelandic Red List.



▲ Distribution of Common Eider in mid-winter counts in Iceland,1952–2014. Mean number of birds per 10 km coastline or at each inland site are indicated (IINH, http://utgafa.ni.is/fjolrit/Fjolrit_55.pdf).



▲ **Annual population indices of Common Eider in Iceland, 1952–2014, based on mid-winter counts. Analysed with TRIM and depicting standard error (IINH, unpublished data).**

Eider are the most common waterbird in Iceland in winter.

EDMUND FELLOWES

Wild goose chasing

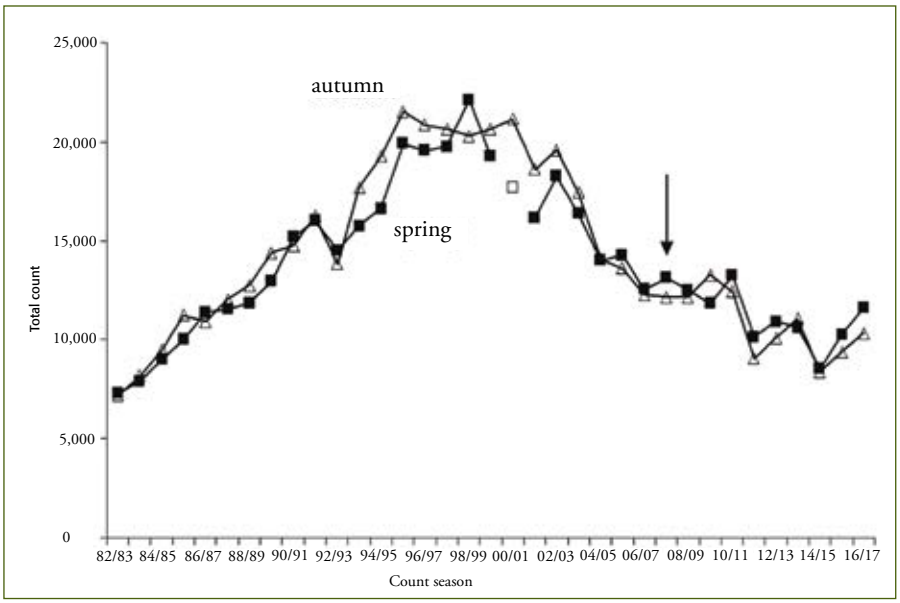
A look into the research carried out by the Greenland White-fronted Goose Study (GWGS).

Greenland White-fronted Geese *Anser albifrons flavirostris* have gone from being one of the UK's least known waterbirds to one of our best understood in a generation – thanks to an unsung network of counters in remote places who have provided counts, age ratios and resightings of marked birds for the last 35 years.

First described by Christopher Dalgety and Peter Scott as a distinct race only in 1948, there was limited information on numbers and distribution until Robin Ruttledge and Malcolm Ogilvie collaborated to publish the first international compilation of data for the whole wintering population in 1979. This was followed in 1982/83, by the National Parks and Wildlife Service (for Ireland) and the Greenland White-fronted Goose Study (for Britain), establishing a twice-yearly international census that attempts to cover every traditional wintering site.

Whilst some counts were made as part of the (then) National Wildfowl Count Scheme, the remoteness of many wintering sites meant that new counters needed to be recruited to count specific flocks, and many of these individuals continue to submit data to the present – contributing hugely to our knowledge of this rare sub-species. The census continues, and typically covers over 95% of the population each winter, and annually feeding data to WeBS.

Following protection from shooting in Ireland and Scotland in winter 1982/3, the population grew to a peak of 35,573 in 1998/99. However, since then there has been progressive and ongoing decline with the March 2017 census locating just 20,556 (Fox *et al.* 2017). Demographic monitoring has long indicated that the cause of the decline was the onset of chronic low production in the mid-1990s. Recent analysis of data on the survival of marked geese has recently confirmed that the decline has indeed been driven by lack of reproduction, rather than increased adult mortality.



▲ **Counts of Greenland White-fronted Geese in Britain, 1982/83 – 2016/17, showing autumn (open triangles) and spring (filled squares) census results for each season. The value for spring 2001 (unfilled square) was missing due to the Foot and Mouth Disease outbreak and estimated from previous counts. The arrow indicates the start of the Icelandic hunting ban in autumn 2006. Source: Fox *et al.* 2017.**

The overall cause seems to be changing North Atlantic weather patterns resulting in high late-spring snowfall on the west Greenland breeding areas – at exactly the time when female geese arrive from their Icelandic staging areas needing to feed to develop a clutch. The situation is likely exacerbated by competition from Canada Geese *Branta canadensis interior* spreading from Canada in the 1990s and which are now very numerous throughout the west Greenland. So, in spring, the few snow-free feeding areas needed by female White-fronts to feed are likely to be already occupied by larger and more numerous Canada Geese.

There have been several conservation responses to the developing situation. Iceland gave Greenland White-fronts legal protection in September 2006, although the geese still remain legal quarry in Wales and England despite a legal obligation under the African-Eurasian Waterbird Agreement (AEWA) for UK to give them protection.

An AEWA Action Plan adopted in 2012 identifies a range of actions. Of particular significance has been the declining status of many of smaller traditional flocks scattered through western and northern Scotland. There has been a continuing process of attrition such that the population has become increasingly restricted to a small number of sites. A 2011 review by Ian Francis and others identified actions that could be taken at some of these small sites but there has been little progress since then. Accordingly, if declining trends continue, we can expect to see a very significant contraction in range in due course.

With such small numbers of young fledging each year, particular attention needs to be given to sustaining adults

EDMUND FELLOWES

▲ **Greenland White-fronted Geese are found at favoured locations, largely on the Inner Hebrides along with small populations in Wales and Ireland.**

i.e. reducing mortality. This has led, in particular, to interventions to prevent new wind energy developments being located inappropriately on flightlines between roost sites and feeding areas, as well as actions to eliminate legal and illegal shooting throughout the range.

Recent work by WWT both at Wexford (by Mitch Weegman and others) and on Islay (by Ed Burrell and others) has looked in detail at how geese exploit agricultural landscapes there and has used novel tracking technologies to better understand the relationship between migration ecology and breeding success (Burrell *et al.* 2017; Weegman *et al.* 2017).

Long-term prospects for the population (whilst current climatic conditions exist) are highly dependent on occasional good breeding years (such as 2010 and 2016) which inject a larger cohort of young birds into the population. The frequency of such years is low however.

Notwithstanding the currently rather bleak prospects for this population, it remains as important as ever to continue the current monitoring so that best conservation responses can be implemented.

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Local effects of population change

A review of research looking at how population changes can lead to changes in local abundance and/or site occupancy.

Species indices, tracking how wintering waterbird populations fluctate and change over time, and individual site totals, are key WeBS annual outputs. Site totals, when compared with 1% thresholds derived from population estimates, are used to designate sites for their national or international importance to one or more "qualifying species". The WeBS Report Online flags which sites held qualifying numbers for each species for the latest WeBS year.

If we know a species is declining nationally, we might ponder whether its distribution is also changing, or is it still occuring on the same sites but in fewer numbers? Is a species with increasing numbers increasing its range, or its density on already occupied sites? Which of these holds true will influence the number of sites holding qualifying levels of the species, and hence how many individuals are on protected sites.

Mendez *et al*. (2018) used WeBS data to look at how mean abundance and site occupancy had changed for 19 species (18 waders and Shelduck) on 83 British estuaries between 1980/81–1984/5 and 2002/03–2006/07. On this set of sites, the abundance of 14 species increased, 9 significantly so. Avocet (+1,690%), Golden Plover (+554%) and Black-tailed Godwit (+418%) had the largest abundance increases. In terms of site occupancy, Black-tailed Godwit (+25 sites) showed the greatest increase, followed by Avocet (+15 sites). Greenshank, Golden Plover and Sanderling also occupied new sites.

Five species declined in abundance, with Purple Sandpiper (-25%) and Shelduck (-25%) declining the most. No species declined in both abundance and site occupancy. Grey Plover increased in abundance over the study period, but the number of occupied sites decreased (-5 sites).

In general, the analysis found changes in wintering populations were manifested as changes in local abundance, rather than changes in site occupancy. The greater the total population change, the greater the change in local abundance. Species that were initially rare (such as Avocet and Black-tailed Godwit) colonised new sites, but the number of individuals occuping new sites was small compared with increases on already occupied sites. Overall there was no significant correlation between changes in site occupancy and total population change.

In the study, population declines primarily occurred in highly abundant species and were not sufficient to reduce local abundances below qualifying thresholds, with the exception of Ringed Plover. This example highlights a risk that a declining population might lose its protection at certain sites, although in practice the site is likely to be protected for multiple species.

The results underlines the importance of schemes such as WeBS that monitor abundance, to ensure declines for long-lived, site-faithful waterbird species are detected before local site extinctions and range contractions occur.

FIND OUT MORE...

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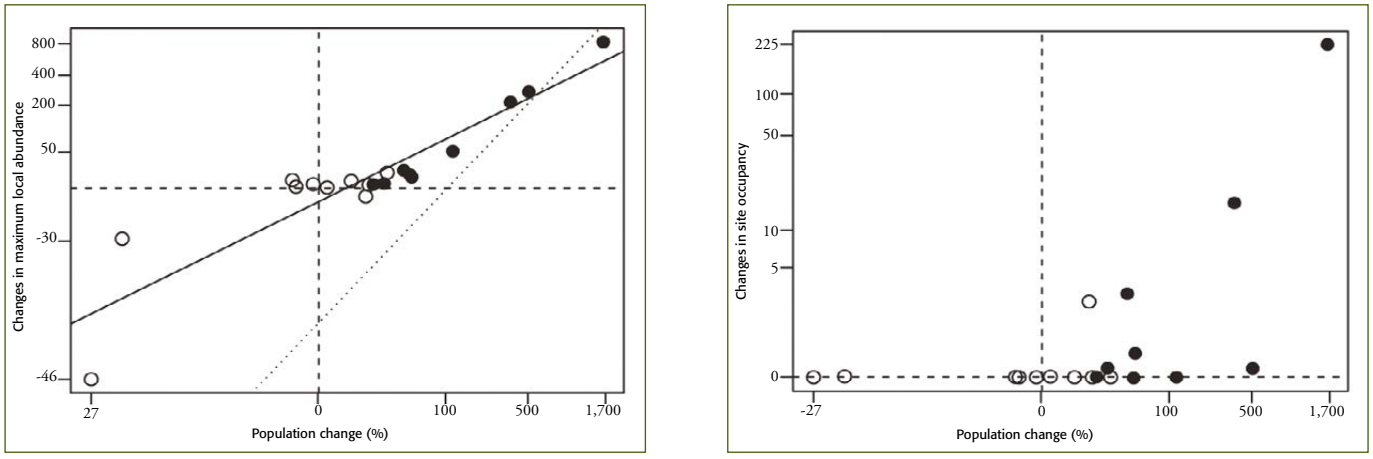


▲ Relationships between changes in total population change and maximum local abundance (left) (solid line, ρ = 0.86, n = 19, p < .001; dotted line, ρ = 0.93, n = 9, p < .001) and changes in site occupancy (right, no correlation). The black solid line shows the correlation when all the species are included, while the dotted line shows the correlation when only species with statistically significant change in abundance are analysed (filled circles). Open circles are species with no statistically significant change. Figure reproduced under Creative Commons Attribution Licence from Méndez *et al.* (2018)

Where do the Dyfi Barnacle Geese breed?

New research reveals where birds wintering on the Dyfi Estuary go to breed.

The Dyfi Estuary in mid-Wales is known as a long-standing haunt of the Greenland White-fronted Goose (page 26). From the 1990s, Barnacle Geese began over-wintering at the Dyfi. It seemed likely that this flock were from the Greenland population of Barnacle Goose, and had followed White-fronted Geese to the site.

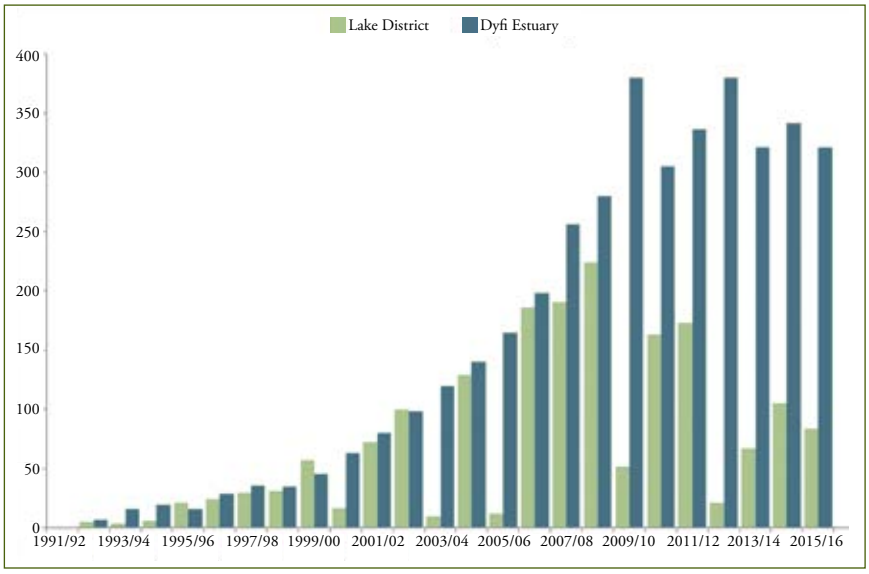
Barnacle Goose numbers increased on the Dyfi, towards the point at which the site could reach the national importance threshold for the Greenland population. Thus their origin became of particular interest, as if the birds are from the British naturalised population, there is no importance threshold, so they would be of a lesser priority for site management.

Dodd (2017) found that the majority of the wintering birds on the Dyfi are, in fact, from the naturalised population. Colour rings were fitted to 25 individuals in November 2013, some of which were later re-sighted at Ynys Talsarnau in January and then at Derwent Water in Cumbria in March and April.

GRAHAM CATLEY

Comparison of WeBS counts from the Dyfi Estuary and non-WeBS summer counts for Derwent Water showed a strong correlation up to 2009. A similar correlation can be seen with peak spring WeBS counts on the Cumbrian lakes holding naturalised geese (Ullswater, Derwent Water and Bassenthwaite). The timing of arrival and departures also suggested a relationship between the flocks.

The divergence in count numbers from 2009 is most likely due to poor count coverage in Cumbria and difficulties in accurately surveying the increased flock on Derwent Water. It is also possible that the Dyfi flock is now supplemented by birds from other naturalised populations, or from Greenland or Svalbard. If so, as with Greylag Geese, in future it may become increasingly difficult to assign Barnacle Geese to populations by their wintering location alone.



▲ **WeBS peak counts for Dyfi Estuary (winter) and Derwent Water, Ullswater & Bassenthwaite Lake in the Lake District (spring). There is poor coverage of the Lake District sites in recent springs.**

FIND OUT MORE...

Dodd, S.G. 2017. Colour-ring resightings and flock counts link the increasing Welsh wintering Barnacle Goose *Branta leucopsis* flock to a naturalised breeding population in the Lake District. *Ringing & Migration* **32(1)**:54–57.

Teeming with Teal

After Mallard, Teal are the most numerous wintering duck in the UK and numbers are increasing rapidly.

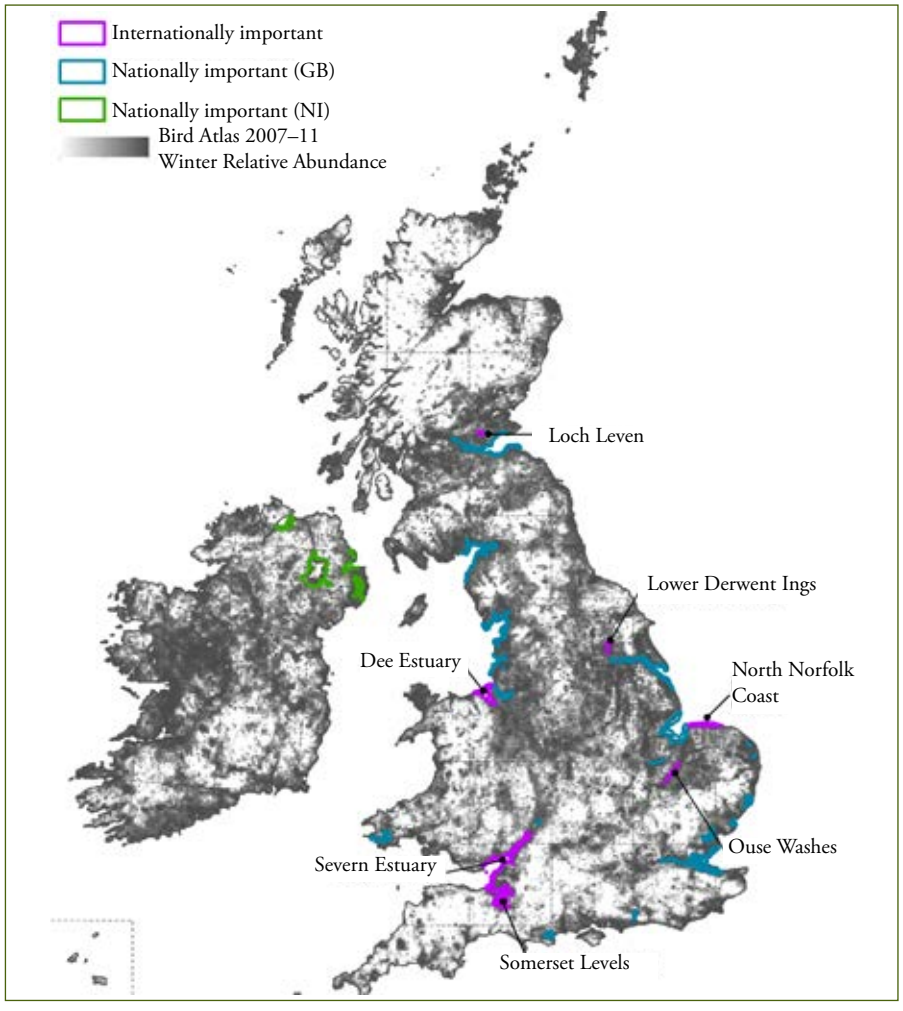
By the early 1960s, the National Wildfowl Counts were counting over 30,000 Teal in Great Britain. Since then both the scheme coverage and the population has grown, with a 2016/17 peak WeBS core count of 185,299 in January. This was slightly below the previous year's peak of 194,066, but above average counts of birds present in September to December helped the WeBS index to its highest ever value. The ten-year trend is stable (+5%) and the 25-year trend is increasing (+42%).

In the WeBS Core Count database, Teal is the ninth most numerous species. Only Mallard and Mute Swan have been recorded on more WeBS count sectors, proving this delightful duck to be one of our most widespread waterbirds, utilising habitats from tiny ponds and marshes to large wetland complexes.

Overall Teal is the fifth most recorded species on all WeBS visits, handicapped slightly by its migrant status, with few birds seen during May to July WeBS counts. The latest breeding estimate was 2,100 pairs in 1993, just 1–2% of the latest wintering estimates of 210,000 (Musgrove, 2011) and 388,000 (Mendez, 2015). It has recently become possible to produce breeding population indices for this species from Breeding Bird Survey data, and this too shows an increase of 46% between 2006 and 2016.

Teal occurs in internationally important numbers at nine sites, and nationally important numbers at a further 30 sites. Many of the major sites are coastal but the most important site for Teal is the Somerset Levels, with an average peak of 21,918 birds over the last five years.

As a quarry species, Teal has good ringing return rates, although biased to areas where hunting is undertaken – 97% of ringing recoveries are from shot birds. Guillemain *et al.* (2017) analysed inter-annual winter recoveries resulting from the ringing of more than 93,000 Teal from Tour du Valat, Camargue, southern France and Abberton Reservoir, Essex. They found that a "British Flyway" is centred on Britain and Ireland and northern Spain, but this overlaps that of a "Mediterranean Flyway" in northern France, northern Belgium, the Netherlands and northern Germany. Ringing results suggest that in the breeding season, the Teal that winter here range over a wide part of Europe.



▲ **Internationally and nationally important sites for Teal (based on WeBS five-year mean for 2012/13–2016/17).**

FIND OUT MORE...

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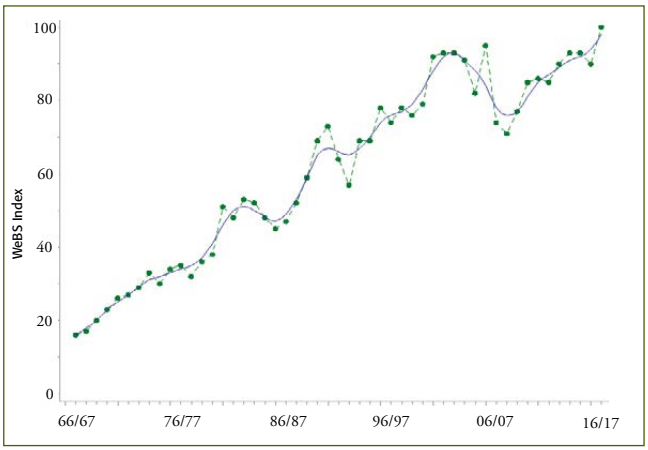
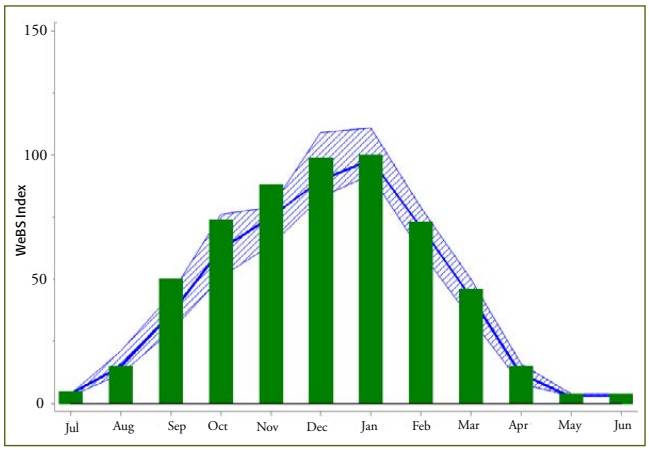
JOHN HARDING

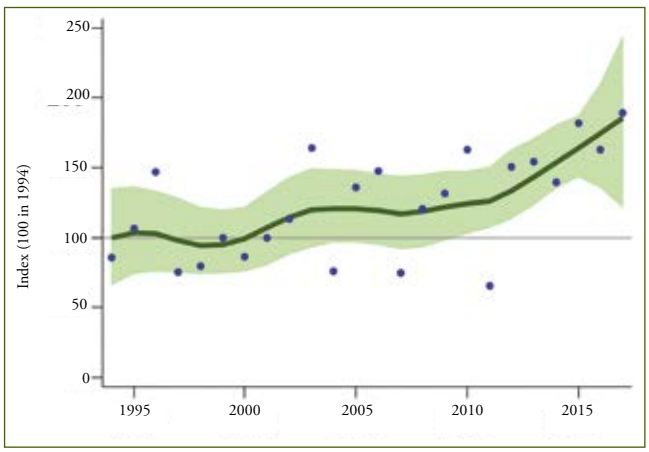
▲ **Teal frequent a wide range of wetlands from small ponds, flooded fields and marshes to large waterbodies and estuaries.**



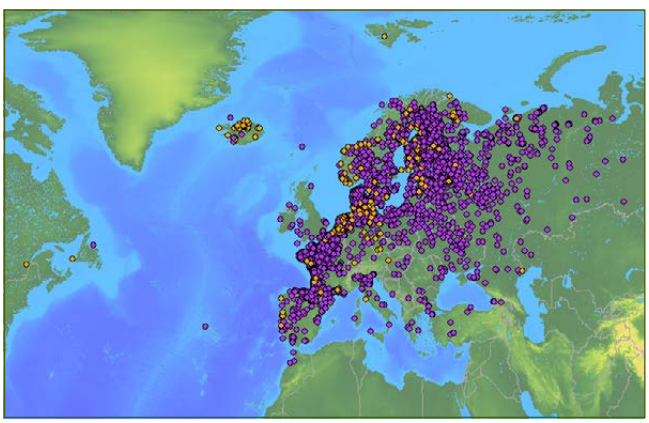
▲ **WeBS trend for Teal in UK.**
Green dots = annual index; blue line = smoothed trend.



▲ **Monthly indices for Teal in UK.**
Green bars = 2016/17; blue line/hatched area = previous 5-year mean/range.



▲ **Breeding Bird Survey index for Teal in UK**
Blue dots = annual index; dark green line = smoothed trend; pale green line = 95% confidence interval of smoothed trend.



▲ **Purple dots indicate locations where birds that have been ringed in Britain or Ireland have been found and yellow dots indicate ringing locations of birds subsequently found in Britain or Ireland.**

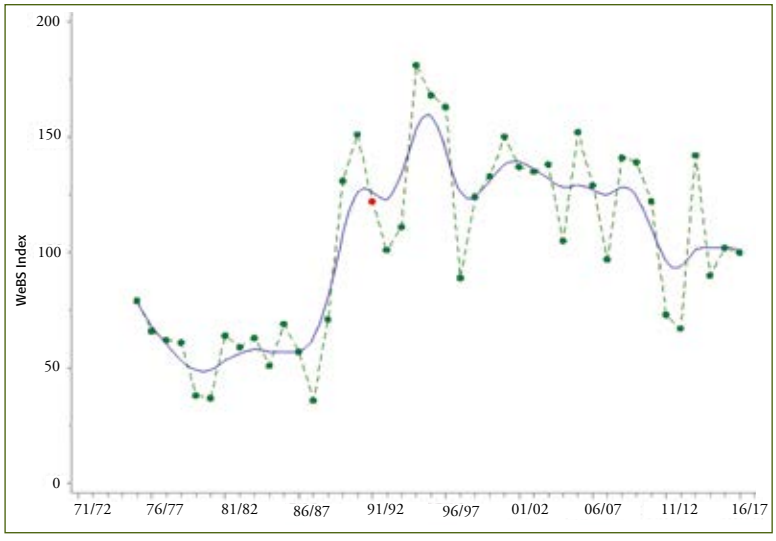
NIKO PEKONEN

Along with Water Rails (page 20), Common Snipe is one of the most difficult of the common WeBS species to monitor. Their cryptic plumage, coupled with their skulking habits mean that even where birds are known to be present, getting an accurate count of them may be difficult to obtain. Also, as Snipe favour bogs, fens and marshy areas, as well as feeding on non-wetland habitats such as winter stubble fields, many birds will invariably turn up on habitats not well covered by WeBS.

Twenty-eight WeBS sites had peaks in excess of 100 birds in 2016/17. The highest counts in excess of 200 birds came from Somerset Levels (1,254), Severn Estuary (654), Morecambe Bay (490), Lower Derwent Ings (480), Duddon Estuary (260), Dearne Valley (234), Castlemartin Corse (234), Cors Crugyll (220), Maer Lake (211), North Norfolk Coast (207), Heaton Park Reservoir (201) and Lunt Meadows (200).

The winter fieldwork for Bird Atlas 2007–11 found that Snipe was the most widespread wintering wader in Britain and Ireland, occuring in 88% of 10-km squares, and since the 1981–84 Winter Atlas there has been a 13% range expansion (Balmer *et al.* 2013). Snipe of the nominate *Gallinago gallinago gallinago* race come to Britain from Scandinavia and mainland Europe, and there is also a significant wintering population of the Icelandic breeding *G. g. faeroeensis* race in Ireland (Wernham *et al.* 2002).

As with many species, Snipe numbers peak in Britain and Ireland during the winter months as birds from the continent add to resident birds. Ringing recoveries suggest that in some years, up to a million Snipe may winter in Britain and Ireland (Musgrove *et al.* 2011), compared with the estimated winter population of 84,000 birds. The vast majority of ringing recoveries both in this country and abroad are from birds shot by hunters, as despite declines in both winter and breeding numbers, the latter making it an Amber List species, Snipe are still a legal quarry species.



▲ **WeBS trend for Snipe in UK.**
Green dots = annual index; red dots = sparse data; blue line = smoothed trend.

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Focus on... Common Gull

RICHARD WINSTON

On the non-estuarine coast in winter, NEWS III found that Common Gull has the most northerly coastal distribution of the regular wintering gull species (Austin 2017). In northern Scotland the species is largely restricted to the coast in winter, but most of the estimated 48,000 GB pairs breed inland in this region in summer.

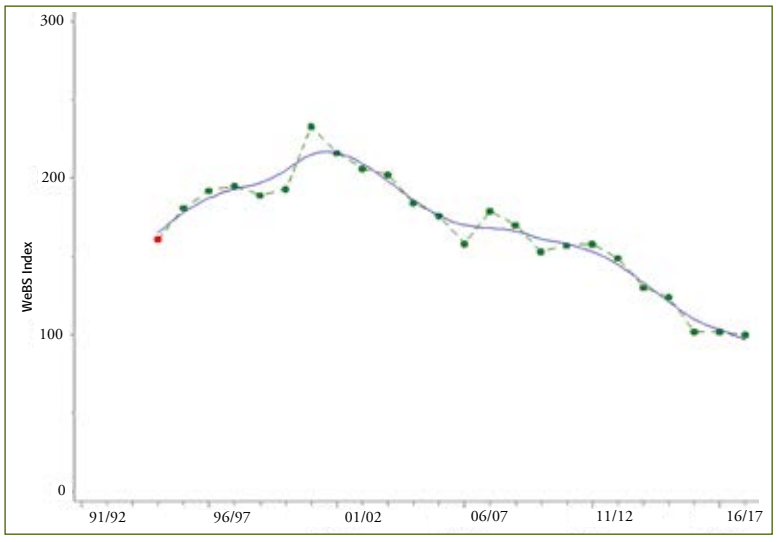
Large numbers of Common Gulls that breed in northern Europe winter in Britain and Ireland, with the estimated population from the most recent Winter Gull Roost Survey being 700,000 (Banks *et al.* 2007). Both the monthly WeBS index and the BirdTrack reporting rate indicate the wintering population to be at its highest in December and January.

Bird Atlas 2007–11 indicates in winter Common Gulls occur inland throughout British lowlands, but only sparsely in SW England and Wales. There was little change in wintering range from the 1981–84 Atlas.

A relatively small proportion of Common Gulls are counted during WeBS Core Counts, with a peak GB total of 43,794 in December and a Northern Ireland peak of 7,704 in January, in 2016/17. Supplementary roost counts are higher, with the highest being Bewl Water, which had peak roost counts of 34,000 in 2016/17 and 85,800 in 2015/16, compared with just eight and three respectively on Core Counts over the same periods. Time of day and weather can have a large effect on the Core Counts (which are exclusively used for indexing), so caution should be taken with interpreting the WeBS indices. The GB index has a ten-year trend of -43% and its lowest ever value in 2016/17. Northern Ireland, in contrast, has a stable index with a ten-year trend of 0%. A repeat of the Winter Gull Roost Survey would help to determine if these trends are genuine, for a species which is amber-listed due to the international importance of the UK, supporting some 50% of the European population in winter.

FIND OUT MORE...

Banks, A.N., Burton, N.H.K., J.R. Calladine., J.R., & Austin, G.E. 2007. *Winter gulls in the UK: population estimates from the 2003/04-2005/06 Winter Gull Roost Survey*. Research Report 456. BTO, Thetford.



▲ **WeBS trend for Common Gull in the UK.**
Green dots = annual index; red dots = sparse data; blue line = smoothed trend.

▲ **Common Gull Bird Atlas 2007–11 Winter Relative Abundance (grey shading) with Common Gull NEWS sector counts (green circles) and the non-estuarine coastal centroids of NEWS sector counts for abundant gull species (pink diamonds).**

Exe Estuary at low tide

Low Tide Counts have been carried out in the UK since 1992/93, with repeat visits to sites enabling a comparison of data between years.

The Exe Estuary is located in Devon on the English south coast. The site extends 10-km south from Exeter to the open sea at Dawlish Warren. It comprises the waters, foreshore, low-lying land, three saltmarshes and an unusual double spit across the mouth of the estuary, and the sand dunes of Dawlish Warren. The mud- and sand-flats support Eelgrass *Zostera* spp. and *Enteromorpha* beds, and contain an abundance of invertebrates including extensive Mussel *Mytilus edulis* beds, which together provide rich feeding habitats for wintering waders and wildfowl. This complex of coastal habitats supports internationally important numbers of wintering and passage waterbirds.

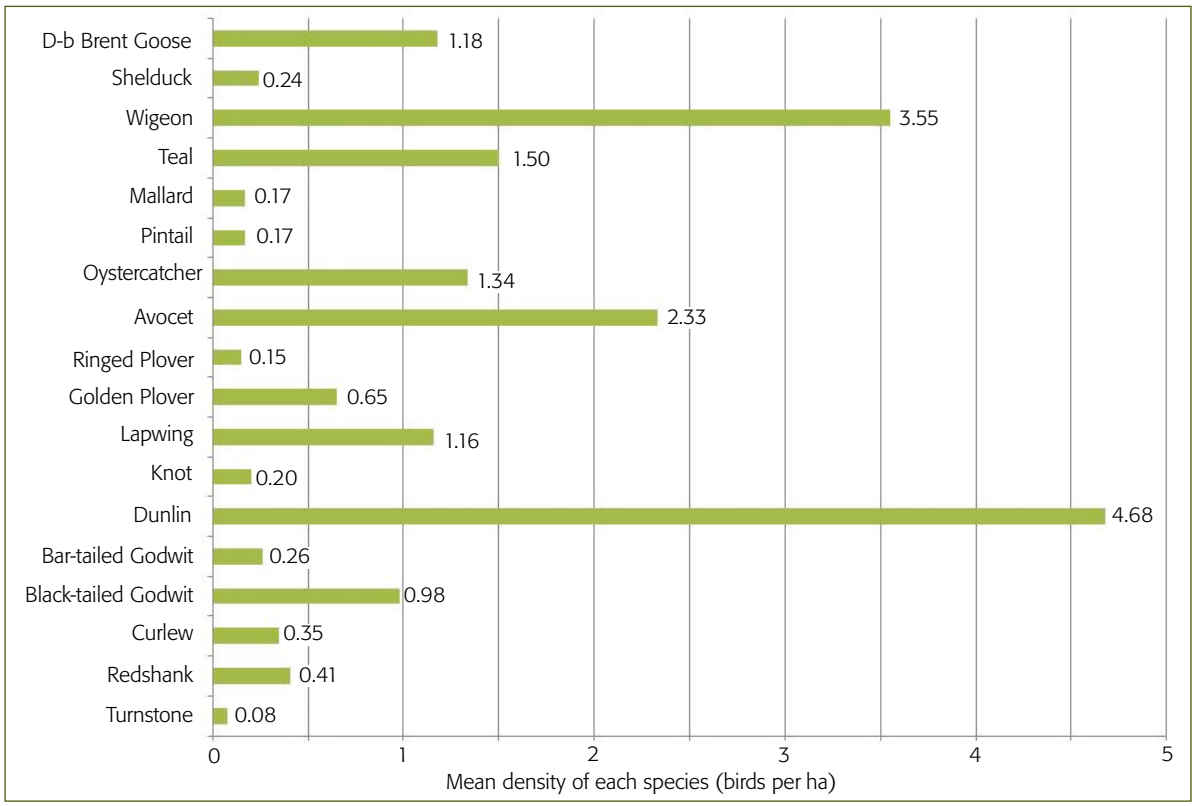
The distribution of two species are mapped on the opposite page. Dark-bellied Brent Goose and Oystercatcher distributions based on WeBS Low Tide Counts undertaken in 2016/17 are displayed for comparison with the respective distributions from 2006/07.

Dark-bellied Brent Geese are present in nationally important numbers, with a five-year average of 1,901 birds showing an increase in recent years. The mean winter counts at low tide on the Exe Estuary have reflected this with 1,428 (1.18 birds per ha) in 2016/17, compared with 1,218 (1.04 birds per ha) ten years ago in 2006/07. The largest concentrations of Dark-bellied Brent Geese in both 2006/07 and 2016/17 were on Powderham Sand, Exminster Marshes and at Starcross with smaller numbers on the Lympstone side of the estuary and around Dawlish Warren at the mouth of the estuary.

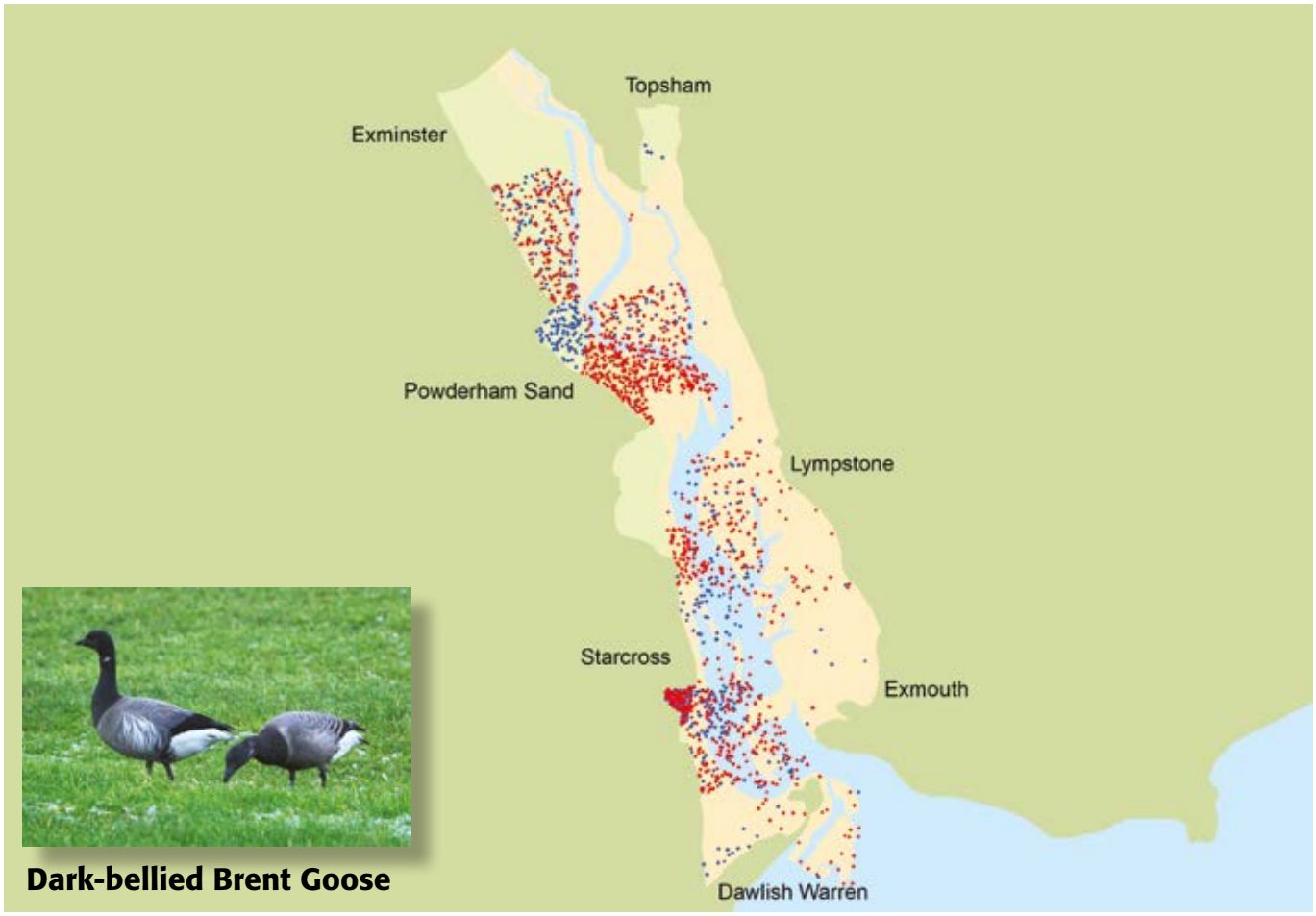
Due to the extensive Mussel beds, the Exe Estuary is an important site for Oystercatchers. Although the five year average from Core Counts is 2,228, this site has seen a long-term decline in this species. The mean winter counts at low tide have also seen a decline, with 1,439 (1.48 birds per ha) in 2006/07 to 1,294 (1.34 birds per ha) in 2016/17. The largest concentrations of birds in both 2006/07 and 2016/17 were at Dawlish Warren, Starcross and between Lympstone and Exmouth, though in 2016/17 Powderham Sand was also favoured.

GENERAL STATISTICS FOR EXE ESTUARY 2016/17

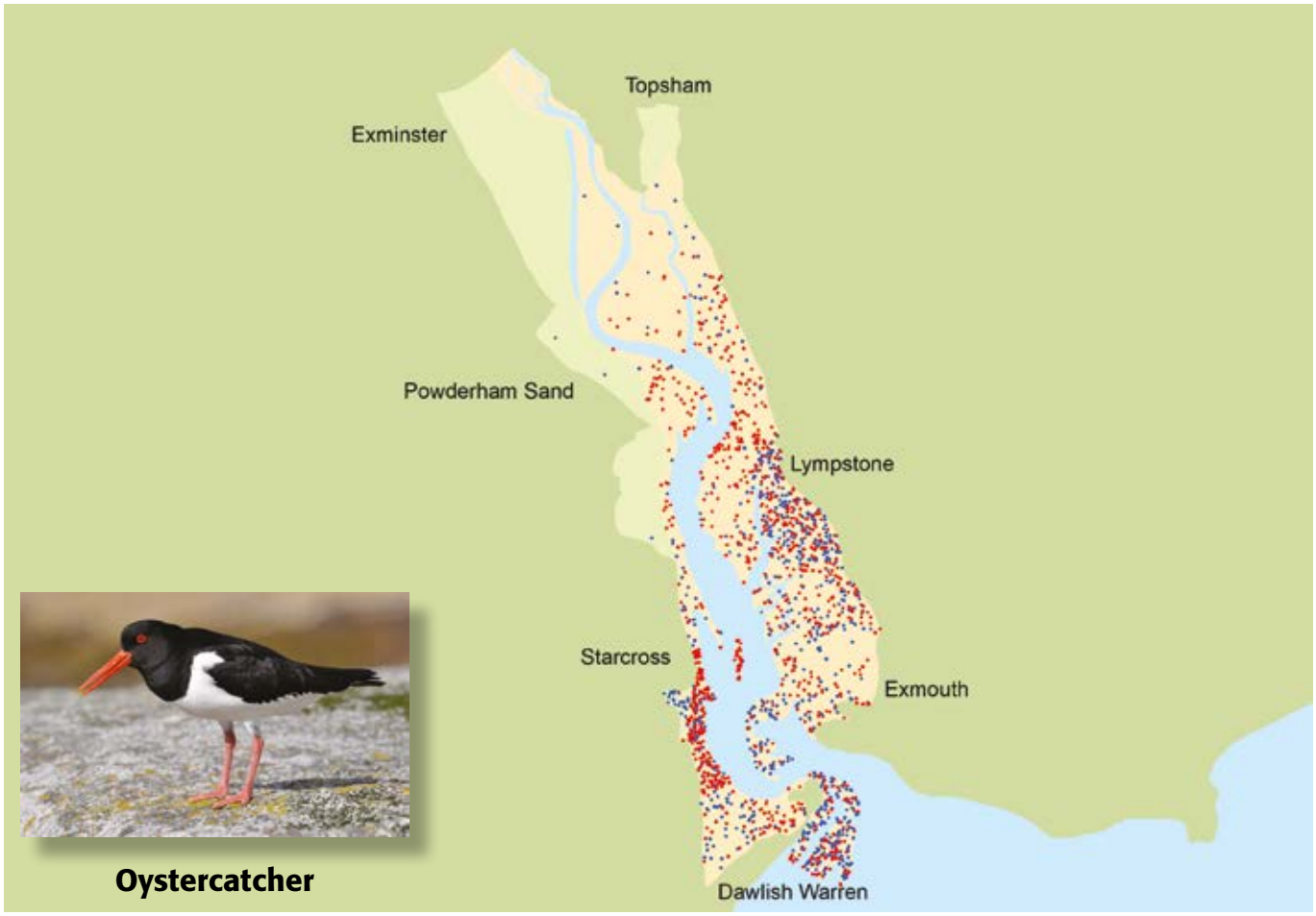
Area covered: 1,615 ha
Mean total birds: 14,224
Mean bird density: 8.81 birds per ha



▲ **Mean densities of waterbirds at low tide on Exe Estuary in 2016/17.**



Dark-bellied Brent Goose



Oystercatcher

OYSTERCATCHER AND DARK-BELLIED BRENT GOOSE BY MOSS TAYLOR

▲ **Low tide distribution of Dark-bellied Brent Goose (1 dot = 2 birds) and Oystercatcher (1 dot = 2 birds) on the Exe Estuary, for the winters of 2016/17 (red) and 2006/07 (blue).**

MARK WILSON

WeBS objectives, aims and methods

The Wetland Bird Survey (WeBS) monitors non-breeding waterbirds in the UK in order to provide the principal data on which the conservation of their populations is based. To this end, WeBS has three main objectives:

- to assess the size of non-breeding waterbird populations in the UK;
- to assess trends in their numbers and distribution; and
- to assess the importance of individual sites for waterbirds.

These results also form the basis for informed decision-making by conservation bodies, planners and developers, and contribute to the sustainable use and management of wetlands and their dependent waterbirds. The data and this annual WeBS report also fulfil some of the objectives of relevant international Conventions and Directives to which the UK is a signatory. WeBS also provides data to Wetlands International to assist their function of coordinating and reporting upon waterbird status at an international flyway scale. WeBS continues the traditions of two long-running count schemes which formed the mainstay of UK waterbird monitoring since 1947.

WeBS Core Counts are carried out at a wide variety of wetlands. Coordinated, synchronous counts are advocated to prevent double-counting or birds being missed. Priority dates are recommended nationally, but due to differences in tidal regimes around the UK, counts take place at some estuaries on other dates in order to match the most suitable local conditions. Weather and counter availability also sometimes result in counts being undertaken on alternative dates.

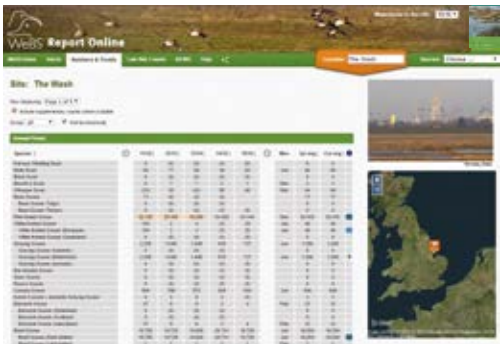
In addition, WeBS Low Tide Counts are undertaken on selected estuaries with the aim of identifying key areas used during the low tide period, principally by feeding birds. It also identifies areas not otherwise noted for their importance from data collected during Core Counts which are normally conducted at, or close to, high tide.

The success and growth of these count schemes reflects the enthusiasm and dedication of the several thousands of participating volunteer ornithologists. It is largely due to their efforts that waterbird monitoring in the UK is held in such high regard internationally.

Full details of WeBS field and analytical methodologies are available via the WeBS website: **www.bto.org/webs**.

Waterbirds in the UK 2016/17 (comprising this summary report together with numbers and trends available from WeBS Report Online at **www.bto.org/webs-reporting**) presents the results of WeBS in 2016/17. Data from other national and local waterbird monitoring schemes, notably the WWT/JNCC/SNH Goose & Swan Monitoring Programme, are included where WeBS data alone are insufficient to fulfil specified aims. The annual WeBS report therefore provides a single, comprehensive source of information on waterbird status and distribution in the UK.

WeBS Report Online



Explore species trends, peak counts and more at **www.bto.org/webs-reporting**

This annual report, *Waterbirds in the UK 2016/17*, combines an extensive online data resource, WeBS Report Online, with this summarised written report.

The WeBS Report Online interface provides access to the latest tables of WeBS Core Count data at site and species level via the 'Numbers and Trends' tab, together with low tide summaries and distribution density maps for estuaries via the 'Low Tide Counts' tab. Results from the Non-Estuarine Waterbird Survey (NEWS) are in the 'NEWS' tab.

For *Waterbirds in the UK 2016/17* a new 'Site Totals' tab has been added, summarising waterbird aggregations at WeBS sites. The default view shows a table of sites with 1000 or more birds and includes supplementary counts but excludes gulls and terns and non-native species, as is standard in the Principal Sites table (see page 12-13). Users can choose to view all sites, including those with fewer than 1,000 birds, for a county or country and optionally include gulls/terns, non-native species and supplementary counts. Selecting a site name brings up a list in the right-hand panel of species at the site where counts exceed national or international importance thresholds.

In the Low Tide section, maps have been upgraded so that up to four interactive distribution density maps can be viewed simultaneously (see page 7) and maps can be viewed for all waterbird species recorded during the survey. Estuaries can be chosen from the Location menu and the survey year from the Low Tide count year menu. Selecting a species will display a map with count sectors separated into intertidal, subtidal and non-tidal habitats and random dots indicating the count of birds in the sector.

In the 'Numbers and Trends' section, searching for their site of interest from the menu allows users to explore which species have ever been recorded at the site. Users can see the peak numbers of each species recorded at the site throughout the year, the five-year mean peak count and the month in which the peak count was recorded. The table can be sorted alphabetically or taxonomically by species or by the peak counts. By scrolling back through the years, contemporary counts and associated five-year averages can be compared with historical counts at the site.

For those looking for information on a particular species (or biogeographic population) of waterbird, every species ever recorded by WeBS features on its own page, with every site where the species has been recorded listed. As well as offering the functionality to sort sites in tables either alphabetically, by annual peak, or by five-year average, the interface also allows the user to filter sites by country, county and/or habitat. Annual and monthly trend plots for the UK and constituent countries are shown (where applicable) and there are also links to other sources of web-based information. Supplementary counts can be included or excluded in the tables. For reference purposes, data from reports for previous years can be accessed by choosing the appropriate WeBS year from the 'Waterbirds in the UK' drop-down menu.

In the NEWS section, users can view maps of counts and coverage for a selected species occurring in a selected region. Tables of regional counts from NEWS and estimates for non-estuarine coastal habitats within the region are given for each species. Results are available for the Winter Shorebird Count and all three NEWS surveys.

FIND OUT MUCH MORE...

Access WeBS Report Online at **www.bto.org/webs-reporting**

The Numbers & Trends section features species trends (for the UK and constituent countries) and site tables for all species (with facility to filter by country, county and habitat), alongside sections on NEWS, Low Tide Counts, Site Totals and WeBS Alerts. There is also a Help section containing tutorials, to help you make the most of the resource.

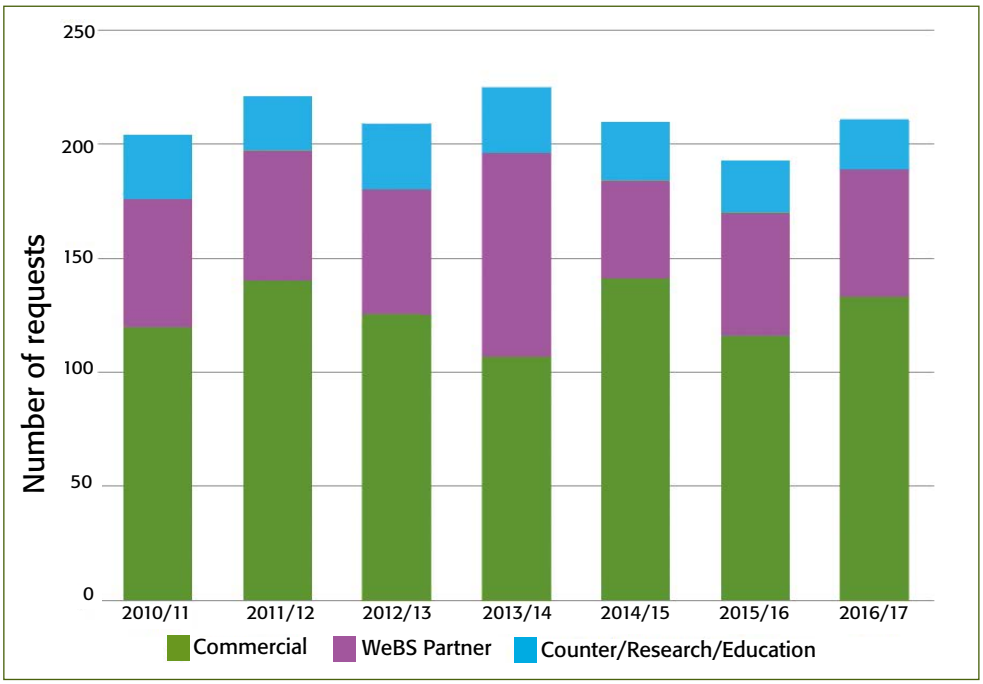
Uses of WeBS data 2016/17

211 WeBS Data Requests in 2016/17

With the UK host to internationally important numbers of over-wintering waterbirds, one of the principal aims of WeBS is to provide data to facilitate their conservation. Indeed, there have been many high-profile examples over the years in which WeBS data have proved to be fundamental in securing the protection of important wetland sites.

A summary of site-based WeBS information is presented on the online interface, but data at a finer level (both spatial and temporal) are available in a user-friendly format through a bespoke WeBS Data Request. Any WeBS-based information that is to be incorporated into site evaluation work, such as Environmental Impact Assessments (EIAs), should be sourced through a WeBS Data Request to ensure the data have been validated and summarised appropriately.

The graph shows the number of Data Requests processed by the WeBS office each year since 2010/11. These are from a range of stakeholder groups, including country conservation agencies, environmental consultancies, academic researchers and bird clubs. Summarised WeBS data are also provided to several online environmental data portals.



▲ **WeBS Data Requests 2010/11 to 2016/17.**

January WeBS data are supplied to Wetlands International for inclusion in the International Waterbird Census, and summaries are used in outputs such as waterbird population estimates, and African-Eurasian Migratory Waterbird Agreement (AEWA) Conservation Status reports.

The WeBS Partnership is keen to encourage WeBS data use within environmental research. A number of scientific papers and reports that have used WeBS data in recent years are referenced within the pages of this annual report, and there is of course an extensive suite of other research questions relating to waterbird ecology and wider wetland management issues to which WeBS data would lend themselves, at both national and international scales.

Academic researchers, students and potential collaborators interested in using WeBS data can email the WeBS office at **websdata@bto.org**.

WeBS DATA REQUESTS

More information about the WeBS Data Request Service is available from **www.bto.org/webs-data** where you can see coverage by WeBS of different sites, check data request charges, and view examples of the data that can be provided.

WeBS Local Organisers in 2016/17

Continued from back page

WALES

Anglesey	Ian Sims
Breconshire	Andrew King
Burry Inlet	Lyndon Jeffery
Caernarfonshire	Rhion Pritchard
Caernarfonshire (Foryd Bay)	Simon Hugheston-Roberts
Cardigan (incl Dyfi Estuary)	Russell Jones
Carmarthenshire	Terry Wells
Clwyd (coastal)	**VACANT** (now Henry Cook)
Clwyd (inland)	Duncan Halpin
East Glamorgan	Daniel Jenkins-Jones
Gwent (excl Severn Estuary)	Al Venables
Merioneth (estuaries)	Jim Dustow
Merioneth (other sites)	Trefor Owen (now Jim Dustow)
Montgomeryshire	Jane Kelsall
Pembrokeshire	Annie Haycock
Radnorshire	Peter Jennings
Severn Estuary (Wales)	Al Venables
West Glamorgan	Lyndon Jeffery

NORTHERN IRELAND

Antrim (Larne Lough)	Doreen Hilditch
Antrim (other sites)	Adam McClure
Armagh (excl Loughs Neagh and Beg)	Stephen Hewitt
Belfast Lough	Shane Wolsey
Down (Carlingford Lough)	Shane Wolsey (now Jenny Lynch)
Down (Dundrum Bay)	Patrick Lynch
Down (other sites)	Shane Wolsey
Down (Outer Ards)	NIEA
Down (South Down Coast)	Shane Wolsey
Down (Strangford Lough)	Kerry Mackie
Fermanagh	Michael Stinson
Londonderry (Bann Estuary)	Hill Dick
Londonderry (Lough Foyle)	Matthew Tickner
Londonderry (other sites)	Shane Wolsey
Loughs Neagh and Beg	NIEA
Tyrone (excl Loughs Neagh and Beg)	Michael Stinson

CHANNEL ISLANDS

Alderney	Alderney Wildlife Trust Ecologist
Channel Islands (inland)	Glyn Young
Guernsey Coast	Mary Simmons
Jersey Coast	Roger Noel

ISLE OF MAN

Isle of Man	Pat Cullen

We would be grateful for help organising WeBS in areas currently without a Local Organiser (marked **VACANT**). If you live in one of these areas and would be interested in taking on the role, please let us know. Email: webs@bto.org

In 2016/17, the WeBS Local Organiser Advisory Committee (WeBS LOAC) comprised Allan Brown, Brian O'Leary, Andrew King, Chris Gunn, Brian Moore, Colin Wells and Kerry Mackie. Many thanks to them for representing the wider LO network. Further information about the WeBS LOAC can be found at **www.bto.org/webs/loac**.

WeBS ONLINE REPORT

Further information, including site tables and trends for all the regular WeBS species, is available in the online report at **www.bto.org/webs-reporting**

Selected further reading

Recent studies that have used WeBS data

Frost, T.M., Austin, G.E., Calbrade, N.A., Mellan, H.J., Hall, C,. Hearn, R.D., Stroud, D.A., Wotton, S.R. & Balmer, D.E. 2017. *Waterbirds in the UK 2015/16: The Wetland Bird Survey*. BTO/RSPB/JNCC. BTO, Thetford.

Amano, T., Székely, T., Sandel, B., Nagy, S., Mundkur, T., Langendoen, T., Blanco, D., Soykan, C.U. & Sutherland, W. J. 2018. Successful conservation of global waterbird populations depends on effective governance. *Nature*. **553(7687)**:199–202.

Austin, G.E., Frost, T.M. & Ross, K. 2017. *Providing data for rapid condition assessment of non-breeding waterbird SPAs in England: Phase II*. Research Report 684. BTO, Thetford.

Austin, G.E., Frost, T.M., Mellan, H.J. & Balmer, D.E. 2017. *Results of the third Non-Estuarine Waterbird Survey, including population estimates for key waterbird species.* Research Report 697. BTO, Thetford.

Cook, A.S.C.P., Barimore, C., Holt, C.A., Read, W.J. & Austin, G.E. 2013. *Wetland Bird Survey Alerts 2009/10: Changes in numbers of wintering waterbirds in the UK, SPAs and SSSIs*. BTO Research Report 641. **www.bto.org/webs-alerts**

Dodd, S.G. 2017. Colour-ring resightings and flock counts link the increasing Welsh wintering Barnacle Goose *Branta leucopsis* flock to a naturalised breeding population in the Lake District. *Ringing & Migration*. **32(1)**:54–57.

Eaton, M.A., Aebischer, N.J., Brown, A.F., Hearn, R.D., Lock, L., Musgrove, A.J., Noble, D.G., Stroud, D.A. & Gregory, R.D. 2015. Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. *British Birds* **108**: 708–746.

Green, R.E. & Pain, D.J. 2016. Possible effects of ingested lead gunshot on populations of ducks wintering in the UK. *Ibis* **158**: 699–710.

Hayhow D.B., Ausden, M.A., Bradbury, R.B., Burnell, D., Copeland, A.I., Crick, H.Q.P., Eaton, M.A., Frost, T., Grice, P.V., Hall, C., Harris, S.J., Morecroft, M.D., Noble, D.G., Pearce-Higgins, J. W., Watts,O. & Williams, J.M. 2017. *The state of the UK's birds 2017*. The RSPB, BTO, WWT, DAERA, JNCC, NE and NRW, Sandy, Bedfordshire. **www.bto.org/SUKB**

Lewis, L.J., Austin, G., Boland, H., Frost, T., Crowe, O. & Tierney, T.D. 2017. Waterbird populations on non-estuarine coasts of Ireland: results of the 2015/16 Non-Estuarine Coastal Waterbird Survey (NEWS-III). *Irish Birds*. **10**:511–522.

Massimino, D., Woodward, I.D., Hammond, M.J., Harris, S.J., Leech, D.I., Noble, D.G., Walker, R.H., Barimore, C., Dadam, D., Eglington, S.M., Marchant, J.H., Sullivan, M.J.P., Baillie, S.R. & Robinson, R.A. 2017. *BirdTrends 2017: trends in numbers, breeding success and survival for UK breeding birds*. Research Report 704. BTO, Thetford. **www.bto.org/birdtrends**

Méndez, V., Austin, G.E., Musgrove, A.J., Ross-Smith, V.H., Hearn, R.D., Stroud, D.A, Wotton, S.R. & Holt, C.A. 2015. Use of environmental stratification to derive non-breeding population estimates of dispersed waterbirds in Great Britain. *Journal for Nature Conservation*. **28**:56–66.

van Roomen, M., Nagy, S., Foppen, R., Dodman, T., Citegetse, G. & Ndiaye, A. 2015. *Status of coastal waterbird populations in the East Atlantic Flyway 2014. With special attention to flyway populations making use of the Wadden Sea*. Programme Rich Wadden Sea, Leeuwarden, The Netherlands.

Stroud, D.A., Bainbridge, I.P., Maddock, A., Anthony, S., Baker, H., Buxton, N., Chambers, D., Enlander, I., Hearn, R.D., Jennings, K.R, Mavor, R., Whitehead, S. & Wilson, J.D. (eds). 2016. *The status of UK SPAs in the 2000s: the third network review*. JNCC, Peterborough.

WeBS

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JNCC

in association with WWT

British Trust for Ornithology
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SPECIAL THANKS

We wish to thank all surveyors and Local Organisers for making WeBS the success it is today. Unfortunately space does not permit all observers to be acknowledged individually, but we would especially like to credit the Local Organisers for their efforts.

WeBS Local Organisers in 2016/17

ENGLAND

Avon (excl Severn Estuary)	Rupert Higgins
Bedfordshire	Richard Bashford
Berkshire	Ken White
Buckinghamshire (North)	Chris Coppock
Buckinghamshire (South)	**VACANT**
Cambridgeshire (incl Huntingdonshire)	Bruce Martin
Cambridgeshire (Nene Washes)	Charlie Kitchin
Cambridgeshire (Ouse Washes)	Paul Harrington
Cheshire (North)	Kane Brides
Cheshire (South)	David Cookson
Cleveland (excl Tees Estuary)	Chris Sharp
Cleveland (Tees Estuary)	Adam Jones
Cornwall (excl Tamar Complex)	Pete Roseveare
Cornwall (Tamar Complex)	Gladys Grant
Cotswold Water Park	Gareth Harris
Cumbria (Duddon Estuary)	Colin Gay
Cumbria (excl estuaries)	Dave Shackleton
Cumbria (Irt/Mite/Esk Estuary)	Peter Jones
Dee Estuary	Colin Wells
Derbyshire	**VACANT**
Devon (other sites)	Pete Reay
Devon (Exe Estuary)	Penny Avant
Devon (Taw/Torridge Estuary)	Tim Davis
Dorset (excl estuaries)	Malcolm Balmer
Dorset (Poole Harbour)	Paul Morton
Dorset (Radipole and Lodmoor)	Toby Branston (now Stephen Hales)
Dorset (The Fleet and Portland Harbour)	Steve Groves
Durham	**VACANT**
Essex (Crouch/Roach Estuaries and South Dengie)	Stephen Spicer
Essex (Hamford Water)	Julian Novorol (now **VACANT**)
Essex (North Blackwater)	John Thorogood
Essex (other sites)	**VACANT** (now Anthony Harbott)
Essex (South Blackwater and North Dengie)	Anthony Harbott
Gloucestershire	Michael Smart
Greater London (excl Thames Estuary)	Andrew Moon
Greater Manchester	Jamie Dunning (now Tim Wilcox)
Hampshire (Avon Valley)	John Clark
Hampshire (estuaries/coastal)	John Shillitoe
Hampshire (excl Avon Valley)	Keith Wills
Herefordshire	Chris Robinson
Hertfordshire	Jim Terry
Humber Estuary (inner South)	Keith Parker
Humber Estuary (mid South)	Richard Barnard
Humber Estuary (North)	Nick Cutts
Humber Estuary (outer South)	John Walker
Isle of Wight	Jim Baldwin
Kent (Dungeness area)	David Walker
Kent (East)	**VACANT**
Kent (North Kent estuaries)	Geoff Orton
Kent (Pegwell Bay)	Ian Hodgson
Kent (West)	**VACANT**
Lancashire (East Lancs and Fylde)	Stephen Dunstan
Lancashire (North inland)	Peter Marsh
Lancashire (Ribble Estuary)	Ken Abram
Lancashire (River Lune)	Jean Roberts
Lancashire (West inland)	Tom Clare
Lee Valley	Cath Patrick
Leicestershire and Rutland (excl Rutland Water)	Brian Moore
Leicestershire and Rutland (Rutland Water)	Tim Appleton
Lincolnshire (North inland)	Chris Gunn
Lincolnshire (South inland)	Bob Titman
Merseyside (Alt Estuary)	Steve White
Merseyside (inland)	Kevin Feeney
Merseyside (Mersey Estuary)	Dermot Smith
Morecambe Bay (North)	**VACANT** (now Peter Hearn)
Morecambe Bay (South)	Jean Roberts
Norfolk (Breydon Water)	Jim Rowe
Norfolk (excl estuaries)	Tim Strudwick
Norfolk (North Nofolk Coast)	Neil Lawton
Northamptonshire (excl Nene Valley)	Barrie Galpin
Northamptonshire (Nene Valley)	Steve Brayshaw
Northumberland (coastal)	Kathy Evans
Northumberland (inland)	Steve Holliday
Northumberland (Lindisfarne)	Andrew Craggs
Nottinghamshire	David Parkin
Oxfordshire (North)	Sandra Bletchly
Oxfordshire (South)	Ben Carpenter
Severn Estuary (England)	Harvey Rose
Shropshire	Michael Wallace
Solway Estuary (inner South)	David Blackledge
Solway Estuary (outer South)	Dave Shackleton
Somerset (other sites)	Eve Tigwell
Somerset (Somerset Levels)	Trish Harper
Staffordshire	Scott Petrek
Suffolk (Alde Complex)	Ian Castle
Suffolk (Alton Water)	John Glazebrook
Suffolk (Blyth Estuary)	Will Russell
Suffolk (Deben Estuary)	Nick Mason
Suffolk (Orwell Estuary)	Mick Wright
Suffolk (other sites)	Alan Miller
Suffolk (Stour Estuary)	Rick Vonk
Surrey	Penny Williams
Sussex (Chichester Harbour)	Peter Hughes
Sussex (other sites)	Helen Crabtree and Dave Boddington
Thames Estuary (Foulness)	Chris Lewis
The Wash	Jim Scott
Warwickshire	Matthew Griffiths
West Midlands	Nick Lewis
Wiltshire	Bill Quantrill (now Claire Young)
Worcestershire	Andrew Warr
Yorkshire (East and Scarborough)	Jim Morgan
Yorkshire (Harrogate and Yorkshire Dales)	Bill Haines
Yorkshire (Huddersfield/Halifax area)	**VACANT**
Yorkshire (Leeds area)	Paul Morris
Yorkshire (South)	Jamie Dunning (now Grant Bigg)
Yorkshire (Wakefield area)	Peter Smith

SCOTLAND

Aberdeenshire	Moray Souter
Angus (excl Montrose Basin)	**VACANT**
Angus (Montrose Basin)	Anna Cheshier
Argyll Mainland	Paul Daw (now Nigel Scriven)
Arran	Jim Cassels
Ayrshire	Dave Grant
Badenoch and Strathspey	Keith Duncan
Borders	Andrew Bramhall
Bute	Ian Hopkins
Caithness	Sinclair Manson
Central (excl Forth Estuary)	Neil Bielby
Clyde Estuary	John Clark
Dumfries and Galloway (Auchencairn and Orchardtown Bays)	Euan MacAlpine
Dumfries and Galloway (Fleet Bay)	David Hawker
Dumfries and Galloway (Loch Ryan)	Paul Collin
Dumfries and Galloway (other sites)	Andy Riches
Dumfries and Galloway (Rough Firth)	Judy Baxter
Dumfries and Galloway (Wigtown Bay)	Paul Collin
Fife (excl estuaries)	Allan Brown
Fife (Tay and Eden Estuaries)	Norman Elkins
Forth Estuary (inner)	Michael Bell
Forth Estuary (outer North)	Alastair Inglis
Forth (outer South)	Duncan Priddle
Glasgow/Renfrewshire/Lanarkshire	John Clark
Harris and Lewis	Yvonne Benting
Islay, Jura and Colonsay	David Wood
Isle of Cumbrae	**VACANT**
Lochaber	John Dye (now **VACANT**)
Lothian (excl estuaries)	Allan Brown
Lothian (Tyninghame Estuary)	Tara Sykes
Moray and Nairn (inland)	David Law
Moray and Nairn (Lossie Estuary)	Bob Proctor
Moray Basin Coast	Bob Swann
Mull	Paul Daw (now Nigel Scriven)
Orkney	Morag Wilson
Perth and Kinross (excl Loch Leven)	Michael Bell
Perth and Kinross (Loch Leven)	Jeremy Squire
Shetland	Paul Harvey
Skye and Lochalsh	Robert Macmillan (now Jonathan Jones)
Solway Estuary (North)	Andy Riches
Sutherland (excl Moray Basin)	**VACANT**
Tiree and Coll	John Bowler
Uists and Benbecula	Yvonne Benting
West Inverness/Wester Ross	Andy Douse

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