

Updating information on the period of reproduction and prenuptial migration for UK and Irish species included on Annex II of the EU Birds Directive

Dario Massimino & Simon Gillings



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1. INTRODUCTION

Article 7(1) of the European Union's Directive 2009/147/EC on the conservation of wild birds (hereafter referred to as 'the Birds Directive') allows for the hunting of species included within Annex II, where such hunting does not jeopardise conservation efforts. Article 7(4) of the Birds Directive further clarifies that species should not be hunted during their reproductive period or, if the species are migratory, during their pre-nuptial migration. This arose from a Court of Justice ruling of 1994 which concluded that the complete protection of huntable species must be guaranteed during these periods.

To ensure effective implementation of these requirements, the European Commission requires Member States to identify the extent of the reproductive period and, where applicable, the timing of pre-nuptial migration for species included on Annex II that occur on their territory. A review of the best available information on the period of pre-nuptial migration and reproduction of each huntable species, for each Member State where that species occurs, was first carried out in 2001. The review was updated in 2009 and again in 2014, primarily to fill in missing data, especially for new Member States, but also to address inconsistencies within the available species information.

Given that one of the key impacts of climate change on birds has been to change the timing of migration and breeding (reviewed by Pearce-Higgins & Green 2014), including in the UK (Thackeray *et al.* 2010; Ockendon *et al.* 2013; Newson *et al.* 2016), there is potential for these timings to change. This is recognised within the Key concepts of Article 7(4): version 2014. As a result, there is a need for the timing of reproduction and pre-nuptial migration to be periodically assessed to avoid the risk of species being hunted during an altered pre-nuptial migration and reproductive period. For example, the timing of mean first egg dates of nesting bird species in the UK has shifted by approximately 2 days per decade during 1976–2005 (Thackeray *et al.* 2010) and by 3 days per decade during 1983–2010 (Franks *et al.* 2017). The timing of first arrival dates of migrant species has shifted by 3 days per decade during 1976–2005 (Thackeray *et al.* 2010), leading to, on average, a 10 day shift in the timing of mean arrival from the mid-1960s to late 2000s, although this varies considerably between species (Newson *et al.* 2016).

At the same time, the development of new tracking technologies enhances our ability to understand the timing of movements and other biological events (e.g. Hewson *et al.* 2016). Irrespective of environmental change, our ability to accurately determine the periods of pre-nuptial migration and breeding might also have improved, potentially altering the assessment that is made.

The output of this analysis will determine the extent of the reproductive period and, where applicable, the timing of pre-nuptial migration for species included on Annex II that occur on the territory of the UK and the territory of the Republic of Ireland, taking account of recent changes, potentially as a result of climate change, and for some species, improved information availability.

2. METHODS

2.1 Hierarchy of data sources

The availability of data to assess the timings of both prenuptial migration and reproduction is likely to vary among species and spatially. To optimise the collation of data in the time available we used the following hierarchy of data sources and methods:

1. count data, ringing data and nest records data from the surveys run by BTO
2. recently published literature on the phenology of the particular species
3. recently published literature on the species' phenology trends.
4. if none of the above were available, we reproduce the timings used in the last assessment, taken directly from the Commission's website.

The following paragraphs describe the data sources and methods in greater detail. Where possible, the methods were applied separately to data for UK, Republic of Ireland, England & Wales, and Scotland & Northern Ireland. However, in many cases, insufficient data were available to undertake analyses at the country level.

2.1.1 BTO surveys to assess timing of prenuptial migration

For waterbirds, we used peak counts per month from the Wetland Bird Survey (WeBS; a partnership jointly funded by the BTO, RSPB and JNCC, in association with WWT, with fieldwork conducted by volunteers). WeBS data are collected on major estuaries and inland waterbodies in the UK on a monthly basis each year. Although the temporal resolution is one month, the shape of the phenological curve often allowed us to estimate the beginning and end of the migration at 10-day resolution. The advantage of using WeBS data was that the survey is specifically aimed at monitoring non-breeding waterbirds in the UK. In addition, subspecies or distinct populations are recorded separately, which is very useful as these need to be individually assessed for some species in Annex II. Comparable phenological curves were available from the Irish Wetland Bird Survey (I-WeBS) for the Republic of Ireland up to the month of March (Crowe 2005), but a reduction in the data available for the months of April and May reduced their usefulness for this purpose (see Discussion).

For some waterbirds, however, recognising the signal of the prenuptial migration from the shape of the count curve was problematic. In these cases we considered the use of BirdTrack data (see below).

For species other than waterbirds and for waterbird species for which identifying the timing of the prenuptial migration from WeBS data was problematic, we used data from BirdTrack (operated by BTO, and supported by BTO, RSPB, BirdWatch Ireland, Scottish Ornithologists' Club, the Welsh Ornithological Society and BirdLife International). Birdwatchers provide lists of birds detected at locations throughout Britain and Ireland. From these, the proportion of complete lists per week on which the species was recorded is used to generate reporting rate curves. We visually assessed these to identify periods of major change in reporting, which coincide with the arrival, departure or migration of different species.

2.1.2 BTO surveys to assess timing of reproduction

Our preferred source of data on the timing of reproduction was the first egg dates estimated from the BTO Nest Record Scheme (NRS; a partnership between BTO and JNCC). Observers submit information on the timing, contents and outcome of nests found throughout the UK, with some data also submitted from the Republic of Ireland. The calculations made to derive the start and end of the reproduction periods from first egg dates is reported in section 2.2.

Where first egg dates from the NRS were not available, we used the dates of ringing of chicks (hereafter 'pulli') from the BTO Ringing Scheme (a partnership between BTO and JNCC), which covers the UK and Republic of Ireland. This was our second choice scheme because the age of the pulli at ringing is not known exactly and, therefore, the estimates of the start and end of the reproduction periods may be less accurate than those obtained by NRS data.

The calculations made to derive the start and end of the reproduction periods from pulli ringing dates is reported in section 2.2.

2.1.3 Recently published literature on species' phenology

Where data from BTO surveys were not available or insufficient to estimate the timing of prenuptial migration or reproduction, we searched the Web of Science database to look for recent (last 10 years) articles describing the phenology of the species of

interest. We used the following query string for each species:

(TS=([Scientific name] AND migration) OR TS=([Scientific name] AND breeding) OR TS=([Scientific name] AND tracking) OR TS=([Scientific name] AND UK) OR TS=([Scientific name] AND Britain) OR TS=([Scientific name] AND Ireland) OR TS=([Scientific name] AND England) OR TS=([Scientific name] AND Scotland)) AND PY=(2008-2018).

2.1.4 Recently published literature on phenological trends

For some species, information on exact dates was not accessible, but long-term phenological trends were available. In such cases, we used the long-term trends to adjust the previous estimates of the timing of pre-nuptial migration or reproduction.

2.1.5 No new data, published timings of phenology trends

When new data on the timing of migration and reproduction were not available, we maintained the

previous estimates as reported in the Key Concepts of Article 7(4) of Directive 79/409/EEC.

2.2 Calculation of the reproduction period

In order to calculate the reproduction period, we used the 5th and 95th percentiles of the first egg dates (from NRS) or pulli ringing dates (from the Ringing Scheme), and demographic constants, which were derived either from the same schemes or from the literature. Analyses of nest records proceeded only where the sample size exceeded 20 monitored nests. If insufficient nest data were available, ringing data were used provided sample size exceeded 20 pulli.

A list of all demographic parameters used and information on where they were derived from is reported in Table 1. The values of the constants used for the assessment, and which were obtained from the literature, are reported in Appendix 1.

Table 1. Demographic parameters, in alphabetic order, used to calculate the reproduction period and their sources. 'BWP' is *The Birds of the Western Palearctic* (Cramp *et al.*1977).

Abbreviation	Description	Source
age_ringed	Age at ringing	Expert opinion. Set to 7 days for all passerines and half the maximum nestling period for non-passerines, unless further modified by species-specific guidance
egint	Interval between eggs being laid	BWP and other publications
end_date_ringed	95th percentile of the ringing dates	Ringing scheme
end_egg	95th percentile of the first egg dates	NRS data
flint	Maximum fledging asynchrony	BWP and other publications
indip	Period of dependence from parents after fledging	BWP and other publications
klu_median	Median clutch size	BWP and other publications
mxdel	Maximum delay during the laying period	BWP and other publications
mxfl	Maximum nestling period	BWP and other publications
mxhat	Maximum hatching asynchrony	BWP and other publications
mxinc	Maximum incubation period	BWP and other publications
nest_constr	Maximum duration of the nest construction period (excluding outliers)	BWP if available. If not, we used the duration for a species as taxonomically close as possible to the species of interest, provided that they have similar nests.
start_date_ringed	5th percentile of the ringing dates	Ringing scheme
start_egg	5th percentile of the first egg dates	NRS data

2.2.1 Start of the reproduction period

When the criterion for the start of the reproduction period was 'construction of the nest', the start date of the reproduction period was calculated from NRS data as:

$$\text{start_egg} - \text{nest_constr}$$

Where NRS data were unavailable or insufficient (fewer than 20 sampled nests), we used the dates of pulli ringing. The formula was:

$$\text{start_date_ringed} - \text{age_ringed} - \text{mxhat} - \text{mxinc} - \text{mxdel} - ((\text{klu_median} - 2) \times \text{egint}) - \text{nest_constr}$$

No new data were generally available on the occupation of the breeding sites or the start of the courtship display, therefore we maintained the previous estimates of the start of the reproduction period for the species for which 'occupation of the breeding sites' or 'courtship display' is the identifying criterion. However, if NRS or pulli ringing data were available, we calculated the beginning of nest construction using the above equations and we checked that this date was not earlier than the previous estimated date of start of the reproduction, in which case we adopted the beginning of the nest construction date as a new estimate.

2.2.2 End of the reproduction period

The end date of the reproduction period was calculated from NRS data as:

$$\text{end_egg} + ((\text{klu_median} - 2) \times \text{egint}) + \text{mxdel} + \text{mxinc} + \text{mxhat} + \text{mxfl} + \text{flint} + \text{indip}$$

Where NRS data were unavailable or insufficient, we used the dates of pulli ringing. The formula was:

$$\text{end_date_ringed} - \text{age_ringed} + \text{mxfl} + \text{flint} + \text{indip}$$

3. RESULTS

Estimated dates of the start and end of migration and breeding are provided in Appendix 2 and supplied in an Access database. The species where our assessment of migration or breeding periods differ from the previous assessment by more than one 10-day period are shown in Appendix 3. As can be seen, the majority of cases where a significant change has been made derive from new primary data (e.g. BirdTrack).

4. DISCUSSION

The migration and breeding timings provided here are based on the best available data and research, but in compiling these results it is clear there are some key data gaps. Furthermore, analytical enhancements might provide more refined answers from limited data. Below we discuss some of the data limitations and make recommendations for at least maintaining and ideally enhancing future capacity for assessments of migration and breeding timing.

4.1 Generic data availability and quality issues

For migration timing our highest quality data source was BirdTrack data and the key limitations for using this data source are the quantity and quality of the available data. In terms of data quantity, BirdTrack coverage is very good in parts of the UK, particularly in England, but the number of participants and the amount of data submitted in the Republic of Ireland is much lower. In terms of quality, BirdTrack users have the option to submit incomplete lists or complete lists of birds. Production of reporting rate curves relies on observers submitting complete lists; from these we can safely infer which species were absent/undetected rather than just not submitted. During 2013–17, on average over 70% of lists submitted were complete lists, though in the Republic of Ireland in 2018 that figure has fallen to 67%. Capacity to produce robust reporting rates for future assessments of migration timing would be significantly enhanced by increasing numbers of people using BirdTrack, and by maintaining or growing the use of complete lists. We recommend greater investment and promotion of BirdTrack, especially in the Republic of Ireland. There are some sites, such as Bird Observatories, which have long runs of historical data that provide a great opportunity to assess trends in migration timing. We recommend support is given to holders of such data sets to help computerise and upload them into BirdTrack for future analyses.

A secondary data source for assessing migration of waterbirds was monthly peak counts produced for WeBS and I-WeBS. Up to date monthly data were available from WeBS but those from I-WeBS were out of date. While we could have requested new graphs, advice from the Republic indicates that coverage of wetlands is significantly reduced after March, limiting the potential of these data for assessing departure dates. We recommend encouraging I-WeBS surveyors to continue their monthly surveys until at least May to provide a fuller picture of wetland usage during key passage times.

As many of the dates provided rely on ringing and nest records data, future revisions will be reliant on the continuation of these demographic schemes. Indeed greater uptake in these schemes, potentially spatially targeted or focussing on poorly surveyed species, might help to provide greater resolution for poorly understood species. For breeding timing our highest quality data source was the Nest Record Scheme as this provides information about key events in the nest with associated dates. Where Nest Records Scheme data were limiting we used ringing data. Start and end dates for breeding based on ringing data have greater uncertainty because we do not know the precise age of birds when they were ringed. This difference may cause apparent anomalies in breeding timing where periods were defined by NRS in the UK and by ringing data in the Republic of Ireland. Officially the NRS covers only the UK, but it also accepts data from the Republic of Ireland. Currently there are fewer than five nest recorders in the whole of the

Republic of Ireland, compared to over 600 in the UK. Within budgetary constraints the NRS team are looking at ways of promoting nest recording in the Republic but a potential limitation is the differing legal requirements of visiting nests in Ireland. We recommend greater investment in training and mentoring of nest recorders to build an effective NRS community in the Republic of Ireland, alongside working with the NPWS to ensure that relevant licence applications under the Wildlife Act are processed efficiently.

4.2 Specific data availability and quality issues

Certain common issues arose across the suite of species covered by this assessment. Excluding major geographic issues, such as lack of data in Republic of Ireland, for which solutions have already been discussed above, the following table summarises specific issues and highlights possible solutions.

Table 2. Specific issues affecting our ability to assess a) migration timing and b) reproductive periods.

a) Migration timing

Issue	Species affected	Possible solutions
Mixing of resident and breeding populations makes detecting a major change in abundance or reporting rate difficult or impossible	Mallard, Eider, Water Rail, Moorhen, Oystercatcher, Lapwing, Woodcock, Curlew, Redshank, gulls, Stock Dove, Woodpigeon, Skylark, Blackbird, Song Thrush, Jackdaw, Rook, Starling	Analysis of ringing data; tracking studies
Poorly detected species means high uncertainty in signals based only on count data	Snipe, Woodcock	Analysis of ringing data
Scarce or localised marine species with highly volatile counts	Eider, Velvet Scoter	More intensive counting to overcome count heterogeneity
Poor temporal resolution of waterbird surveys (currently monthly) limit ability to assign migration to 10-day periods	All waterbirds	Additional count data from estuaries, potentially analysed in a hierarchical manner with core WeBS data to produce more temporally refined abundance estimates

b) Reproductive period

Issue	Species affected	Possible solutions
No or very limited nest records or ringing data	Ducks, gamebirds, Herring Gull	Promotion and targeting of demographic work at open-nesting and ground-nesting species, especially waterbirds and gamebirds.

Among the solutions mentioned in Table 2 it should be noted that analyses of ringing data are planned as part of the forthcoming *European Migration Atlas*. We recommend close engagement with the *European Migration Atlas* team to understand whether ringing data can overcome the problem highlighted here.

Tracking studies are highlighted as one way of potentially getting more information on periods of movement for individual birds. Tracking studies often have small sample sizes, making inferences about populations difficult. But they may provide useful insights when used in conjunction with other data sources. Tracking studies are currently underway for Curlew, Woodcock and several gull species. We recommend liaison with groups working on these species to ensure relevant metrics emerge, as defining migration timing may not be the principle purpose of those projects.

Increased nest recording and ringing of open-nesting and ground-nesting species has been actively promoted for several years. Training and mentoring has proven to be very effective in increasing nest recording but each event can only support small numbers of people. More resources are needed to spread this model more widely if a step change in reporting is required.

4.3 Analytical improvements

The analyses undertaken here are conceptually simple in that they use existing estimates, such as those for first egg dates, or rely upon visual interpretation of existing plots of reporting rate curves. Future revisions of migration and breeding phenology could be based on novel analyses of new and existing data. For example, it would be possible to undertake novel analysis of BirdTrack data using turning point analyses, to quantitatively identify the start and end of the prenuptial migration period. By plotting the second derivative of the smoothed relationship between the frequency of records as complete lists and day of the year, standard metrics for the start and end of particular migratory periods can be identified (Newson *et al.* 2016). With development, it may be possible to use these occurrence data to separately estimate periods of prenuptial migration, and periods of breeding ground occupancy, from equivalent patterns of occupancy estimated separately from within the breeding distribution, for example identified from occupied squares within *Bird Atlas 2007–11* (Balmer *et al.* 2013). This would be an adaptation of an approach already used to identify monthly variation in the frequency of occurrence of British bird species (Sterry & Standcliffe 2015).

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APPENDIX I

Values of the demographic constants used for the assessment that were obtained from the literature. For abbreviations of constants, see Table 1.

English name	egint	flint	indip	klu_median	mxdel	mxfl	mxhat	mxinc	nest_constr
Mute Swan	1	2	0	6	3	150	2	44	10
Greylag Goose	1	2	0	6	2	65	2	30	6
Canada Goose	1	2	0	6	2	65	2	30	6
Gadwall	1	2	0	10	2	50	2	26	6
Mallard	1	3	0	10	3	60	3	32	Not available
Shoveler	1	3	0	10	3	45	3	23	6
Pochard	1	2	0	9.5	2	50	2	28	6
Tufted Duck	1	2	0	9	2	50	2	28	6
Goosander	1	2	0	9.5	2	70	2	32	6
Red Grouse	1	2	23	7.5	2	35	2	25	14
Water Rail	1	10	0	8.5	2	30	10	22	7
Moorhen	1	10	24	6	2	65	10	22	7
Coot	1	10	0	6	2	60	10	24	7
Oystercatcher	2	7	0	3	2	32	2	30	Not available
Golden Plover	2	2	0	4	2	30	2	31	21
Lapwing	1	11	0	4	2	42	4	30	Not available
Snipe	1	6	0	4	4	20	1	21	Not available
Black-tailed Godwit	1	7	0	3.5	2	30	2	24	Not available
Whimbrel	1	7	0	3.5	2	40	2	28	Not available
Curlew	1	7	0	4	2	42	2	34	Not available
Redshank	1	4	0	4	3	31	2	27	Not available
Black-headed Gull	1	4	0	2.5	3	35	2	26	7
Common Gull	1	4	0	3	3	35	2	28	7
Lesser Black-backed Gull	1	4	2	3	3	40	2	27	7
Great Black-backed Gull	1	4	2	2.5	3	56	2	28	7
Rock Dove	1	4	2	2	2	37	2	19	4
Stock Dove	1	4	2	2	2	36	2	26	4
Woodpigeon	1	4	10	2	2	35	2	17	12
Collared Dove	1	2	7	2	2	22	2	18	4
Turtle Dove	1	4	2	2	2	21	2	16	12
Skylark	1	3	2	4	2	20	2	16	Not available
Blackbird	1	3	0	4	2	18	2	15	14
Song Thrush	1	3	14	4	2	16	2	16	13
Mistle Thrush	1	3	14	4	4	20	2	19	13
Jay	1	2	31	5	3	23	5	19	9
Magpie	1	3	34	6	3	33	8	23	12
Jackdaw	1	5	35	4	2	35	2	23	27
Rook	1	4	42	3	3	34	5	18	28
Carriion Crow/Hooded Crow	1	2	22	4	2	36	2	20	31
Starling	1	3	5	5	2	29	2	15	9

APPENDIX 2

Final estimates of the start and end of pre-nuptial migration and breeding for Annex II bird species in the UK and Republic of Ireland. UK: United Kingdom; EW: England and Wales; SNI: Scotland and Northern Ireland; ROI: Republic of Ireland. Dates are beginning and end of 10-day periods within each month. Missing dates are due to insufficient data or the species not reproducing or migrating in the study area. For further details and full reference list see the database of the Key concepts of Article 7(4) of Directive 79/409/EEC.

Country	Scientific name	English name	Pre-nuptial migration		Reproduction		References	
			Start	End	Start	End	Pre-nuptial migration	Reproduction
UK	<i>Cygnus olor</i>	Mute Swan			01-Mar	20-Dec		BTO Nest Record Scheme, Cramp 1977–1994
EW	<i>Cygnus olor</i>	Mute Swan			01-Mar	20-Dec		BTO Nest Record Scheme, Cramp 1977–1994
SNI	<i>Cygnus olor</i>	Mute Swan			01-Mar	20-Dec		BTO Nest Record Scheme, Cramp 1977–1994
ROI	<i>Cygnus olor</i>	Mute Swan			11-Apr	20-Oct		Cramp 1977–1994, Harrison 1975
UK	<i>Anser fabalis</i>	Taiga Bean Goose	01-Feb	30-Apr			Mitchell <i>et al.</i> 2016	
EW	<i>Anser fabalis</i>	Taiga Bean Goose	01-Feb	30-Apr			Mitchell <i>et al.</i> 2016	
SNI	<i>Anser fabalis</i>	Taiga Bean Goose	01-Feb	30-Apr			Mitchell <i>et al.</i> 2016	
ROI	<i>Anser fabalis</i>	Taiga Bean Goose						
UK	<i>Anser brachyrhynchus</i>	Pink-footed Goose	01-Mar	20-May			BirdTrack	
EW	<i>Anser brachyrhynchus</i>	Pink-footed Goose	01-Mar	20-May			BirdTrack	
SNI	<i>Anser brachyrhynchus</i>	Pink-footed Goose	21-Mar	20-May			BirdTrack	
ROI	<i>Anser brachyrhynchus</i>	Pink-footed Goose						
UK	<i>Anser albifrons albifrons</i>	White-fronted Goose (European)	21-Feb	20-May			BTO WebS Annual Report	
EW	<i>Anser albifrons albifrons</i>	White-fronted Goose (European)	21-Feb	20-May			BTO WebS Annual Report	
SNI	<i>Anser albifrons albifrons</i>	White-fronted Goose (European)						
ROI	<i>Anser albifrons albifrons</i>	White-fronted Goose (European)						
UK	<i>Anser albifrons flavirostris</i>	White-fronted Goose (Greenland)	21-Mar	30-Apr			BTO WebS Annual Report	
EW	<i>Anser albifrons flavirostris</i>	White-fronted Goose (Greenland)	21-Mar	30-Apr			BTO WebS Annual Report	
SNI	<i>Anser albifrons flavirostris</i>	White-fronted Goose (Greenland)	21-Mar	30-Apr			BTO WebS Annual Report	
ROI	<i>Anser albifrons flavirostris</i>	White-fronted Goose (Greenland)	01-Apr	10-May			Cramp 1977–1994, Fox & Walsh 2012	
UK	<i>Anser anser</i>	Greylag Goose	01-Mar	10-May	01-Mar	20-Aug	Cramp 1977–1994, Sparks <i>et al.</i> 2006	BTO Nest Record Scheme, Cramp 1977–1994
EW	<i>Anser anser</i>	Greylag Goose	01-Mar	10-May	01-Mar	20-Aug	Cramp 1977–1994, Sparks <i>et al.</i> 2006	BTO Nest Record Scheme, Cramp 1977–1994

Country	Scientific name	English name	Prenuptial migration		Reproduction		References	
			Start	End	Start	End	Prenuptial migration	Reproduction
SNI	<i>Anser anser</i>	Greylag Goose	01-Mar	10-May			Cramp 1977–1994, Sparks <i>et al.</i> 2006	
ROI	<i>Anser anser</i>	Greylag Goose	11-Mar	30-Apr	01-Apr	20-Jul	Cramp 1977–1994, Sparks <i>et al.</i> 2006	Cramp 1977–1994, Gibbons <i>et al.</i> 1993, Hutchinson 1989
UK	<i>Branta canadensis</i>	Canada Goose			01-Mar	10-Aug		BTO Nest Record Scheme, Cramp 1977–1994
EW	<i>Branta canadensis</i>	Canada Goose			01-Mar	10-Aug		BTO Nest Record Scheme, Cramp 1977–1994
SNI	<i>Branta canadensis</i>	Canada Goose			01-Mar	10-Aug		Cramp 1977–1994
ROI	<i>Branta canadensis</i>	Canada Goose			11-Apr	20-Jul		
UK	<i>Branta bernicla bernicla</i>	Brent Goose (dark-bellied)	01-Mar	10-Jun			BTO WebS Annual Report	
EW	<i>Branta bernicla bernicla</i>	Brent Goose (dark-bellied)	01-Mar	10-Jun			BTO WebS Annual Report	
SNI	<i>Branta bernicla bernicla</i>	Brent Goose (dark-bellied)						
ROI	<i>Branta bernicla bernicla</i>	Brent Goose (dark-bellied)						
UK	<i>Branta bernicla hrota</i> (Greenland/East Canadian high arctic)	Brent Goose (light-bellied of Nearctic origin)	01-Apr	10-Jun			BTO WebS Annual Report	
EW	<i>Branta bernicla hrota</i> (Greenland/East Canadian high arctic)	Brent Goose (light-bellied of Nearctic origin)	01-Apr	10-May			BTO WebS Annual Report	
SNI	<i>Branta bernicla hrota</i> (Greenland/East Canadian high arctic)	Brent Goose (light-bellied of Nearctic origin)	01-Apr	10-Jun			BTO WebS Annual Report	
ROI	<i>Branta bernicla hrota</i> (Greenland/East Canadian high arctic)	Brent Goose (light-bellied of Nearctic origin)	21-Mar	20-May			BirdTrack	
UK	<i>Branta bernicla hrota</i> (Spitzbergen/Franz.Josef Land)	Brent Goose (light-bellied of Svalbard origin)	20-Feb	10-May			BTO WebS Annual Report	
EW	<i>Branta bernicla hrota</i> (Spitzbergen/Franz.Josef Land)	Brent Goose (light-bellied of Svalbard origin)	20-Feb	31-Mar			BTO WebS Annual Report	
SNI	<i>Branta bernicla hrota</i> (Spitzbergen/Franz.Josef Land)	Brent Goose (light-bellied of Svalbard origin)	01-Mar	10-May			BTO WebS Annual Report	
ROI	<i>Branta bernicla hrota</i> (Spitzbergen/Franz.Josef Land)	Brent Goose (light-bellied of Svalbard origin)						
UK	<i>Anas penelope</i>	Wigeon	21-Feb	31-May	01-May	31-Aug	BirdTrack	Cramp 1977–1994
EW	<i>Anas penelope</i>	Wigeon	21-Feb	31-May	01-May	31-Aug	BirdTrack	Cramp 1977–1994
SNI	<i>Anas penelope</i>	Wigeon	11-Mar	31-May	01-May	31-Aug	BirdTrack	Cramp 1977–1994
ROI	<i>Anas penelope</i>	Wigeon	11-Mar	21-May	01-May	31-Aug	BirdTrack	Cramp 1977–1994
UK	<i>Anas strepera</i>	Gadwall	01-Mar	10-May	11-Apr	30-Sep	BTO WebS Annual Report	BTO Ringing Scheme, Cramp 1977–1994
EW	<i>Anas strepera</i>	Gadwall	01-Mar	10-May	11-Apr	30-Sep	BTO WebS Annual Report	BTO Ringing Scheme, Cramp 1977–1994

				References			
Country	Scientific name	English name	Pre-nuptial migration		Reproduction		References
			Start	End	Start	End	
SNI	<i>Anas strepera</i>	Gadwall	01-Mar	10-May			
ROI	<i>Anas strepera</i>	Gadwall	01-Mar	30-Apr	21-Apr	10-Aug	Cramp 1977–1994, Gibbons <i>et al.</i> 1993, Hutchinson 1989
UK	<i>Anas crecca</i>	Teal	11-Feb	30-May	21-Mar	20-Aug	BTO WebS Annual Report
EW	<i>Anas crecca</i>	Teal	11-Feb	30-May	21-Mar	20-Aug	BTO WebS Annual Report
SNI	<i>Anas crecca</i>	Teal	11-Feb	30-May	21-Mar	20-Aug	BTO WebS Annual Report
ROI	<i>Anas crecca</i>	Teal	01-Feb	10-May	21-Mar	20-Aug	Cramp 1977–1994, Gibbons <i>et al.</i> 1993, Hutchinson 1989
UK	<i>Anas platyrhynchos</i>	Mallard	01-Feb	10-Jun	21-Feb	30-Sep	BirdTrack
EW	<i>Anas platyrhynchos</i>	Mallard	01-Feb	20-May	21-Feb	30-Sep	BirdTrack
SNI	<i>Anas platyrhynchos</i>	Mallard	01-Feb	10-Jun	11-Mar	30-Sep	BirdTrack
ROI	<i>Anas platyrhynchos</i>	Mallard	11-Feb	10-Jul	11-Feb	30-Sep	Cramp 1977–1994, Hutchinson 1989
UK	<i>Anas acuta</i>	Pintail	21-Feb	31-May	01-Apr	31-Aug	BirdTrack
EW	<i>Anas acuta</i>	Pintail	21-Feb	31-May	01-Apr	31-Aug	BirdTrack
SNI	<i>Anas acuta</i>	Pintail	21-Feb	31-May	01-Apr	31-Aug	BirdTrack
ROI	<i>Anas acuta</i>	Pintail	21-Feb	20-Apr	11-Apr	21-Aug	Cramp 1977–1994, Hutchinson 1989
UK	<i>Anas querquedula</i>	Garganey	11-Mar	20-Jun	21-Mar	31-Jul	BirdTrack
EW	<i>Anas querquedula</i>	Garganey	11-Mar	20-Jun	21-Mar	31-Jul	BirdTrack
SNI	<i>Anas querquedula</i>	Garganey	11-Mar	20-Jun	21-Mar	31-Jul	BirdTrack
ROI	<i>Anas querquedula</i>	Garganey	01-Apr	20-Jun	11-Apr	20-Aug	BirdTrack
UK	<i>Anas clypeata</i>	Shoveler	01-Mar	30-May	01-Apr	20-Sep	BTO WebS Annual Report
EW	<i>Anas clypeata</i>	Shoveler	01-Mar	30-Apr	01-Apr	20-Sep	BTO WebS Annual Report
SNI	<i>Anas clypeata</i>	Shoveler	01-Mar	30-May			BTO WebS Annual Report
ROI	<i>Anas clypeata</i>	Shoveler	01-Feb	20-Apr	01-Apr	20-Aug	Cramp 1977–1994, Gibbons <i>et al.</i> 1993, Hutchinson 1989
UK	<i>Netta rufina</i>	Red-crested Pochard					
EW	<i>Netta rufina</i>	Red-crested Pochard					
SNI	<i>Netta rufina</i>	Red-crested Pochard					
ROI	<i>Netta rufina</i>	Red-crested Pochard					
UK	<i>Aythya ferina</i>	Pochard	21-Feb	30-Apr	11-Apr	20-Sep	BirdTrack

Country	Scientific name	English name	Pre-nuptial migration		Reproduction		References	
			Start	End	Start	End	Pre-nuptial migration	Reproduction
EW	<i>Aythya ferina</i>	Pochard	21-Feb	30-Apr	11-Apr	20-Sep	BirdTrack	BTO Ringing Scheme, Cramp 1977–1994
SNI	<i>Aythya ferina</i>	Pochard	01-Mar	30-Apr			BirdTrack	
ROI	<i>Aythya ferina</i>	Pochard	01-Feb	10-Apr	21-Apr	10-Aug	Cramp 1977–1994, Gibbons <i>et al.</i> 1993	Cramp 1977–1994, Gibbons <i>et al.</i> 1993, Hutchinson 1989
UK	<i>Aythya fuligula</i>	Tufted Duck	01-Mar	10-May	21-Apr	30-Sep	BTO WebS Annual Report	BTO Nest Record Scheme, Cramp 1977–1994
EW	<i>Aythya fuligula</i>	Tufted Duck	01-Mar	10-May	21-Apr	30-Sep	BTO WebS Annual Report	BTO Nest Record Scheme, Cramp 1977–1994
SNI	<i>Aythya fuligula</i>	Tufted Duck	01-Mar	10-May			BTO WebS Annual Report	
ROI	<i>Aythya fuligula</i>	Tufted Duck	01-Feb	20-Apr	11-May	10-Sep	Cramp 1977–1994, Hutchinson 1989	Cramp 1977–1994, Gibbons <i>et al.</i> 1993, Hutchinson 1989, Harrison 1975
UK	<i>Aythya marila</i>	Scaup	21-Feb	30-May			BirdTrack	Holling <i>et al.</i> 2011
EW	<i>Aythya marila</i>	Scaup	21-Feb	30-May			BirdTrack	
SNI	<i>Aythya marila</i>	Scaup	21-Feb	30-May			BirdTrack	Holling <i>et al.</i> 2011
ROI	<i>Aythya marila</i>	Scaup	21-Feb	10-May			Cramp 1977–1994, Hutchinson 1989	
UK	<i>Somateria mollissima</i>	Eider	21-Feb	10-May	11-Apr	20-Sep	Cramp 1977–1994	Campbell & Ferguson-Lees 1972
EW	<i>Somateria mollissima</i>	Eider						
SNI	<i>Somateria mollissima</i>	Eider						
ROI	<i>Somateria mollissima</i>	Eider			11-Apr	31-Aug		Cramp 1977–1994, Gibbons <i>et al.</i> 1993, Hutchinson 1989
UK	<i>Clangula hyemalis</i>	Long-tailed Duck	01-Mar	10-Jun			BirdTrack	
EW	<i>Clangula hyemalis</i>	Long-tailed Duck	01-Mar	10-Jun			BirdTrack	
SNI	<i>Clangula hyemalis</i>	Long-tailed Duck	01-Mar	10-Jun			BirdTrack	
ROI	<i>Clangula hyemalis</i>	Long-tailed Duck	11-Mar	10-May			Cramp 1977–1994, Hutchinson 1989	
UK	<i>Melanitta nigra</i>	Common Scoter	21-Feb	10-Jun	21-Apr	31-Aug	Cramp 1977–1994, Sparks <i>et al.</i> 2006	Hancock 1991
EW	<i>Melanitta nigra</i>	Common Scoter	21-Feb	10-Jun			Cramp 1977–1994, Sparks <i>et al.</i> 2006	
SNI	<i>Melanitta nigra</i>	Common Scoter	21-Feb	10-Jun	21-Apr	31-Aug	Cramp 1977–1994, Sparks <i>et al.</i> 2006	Hancock 1991
ROI	<i>Melanitta nigra</i>	Common Scoter	21-Feb	10-May	21-May	31-Aug	Cramp 1977–1994, Sparks <i>et al.</i> 2006	Cramp 1977–1994, Harrison 1975
UK	<i>Melanitta fusca</i>	Velvet Scoter	01-Mar	30-May			Cramp 1977–1994	
EW	<i>Melanitta fusca</i>	Velvet Scoter					Cramp 1977–1994	
SNI	<i>Melanitta fusca</i>	Velvet Scoter					Cramp 1977–1994	
ROI	<i>Melanitta fusca</i>	Velvet Scoter	21-Feb	10-May			Cramp 1977–1994, Hutchinson 1989	

Scientific name			English name			Pre-nuptial migration		Reproduction		References	
Country	Scientific name	English name	Start	End	Start	End	Start	End	Pre-nuptial migration	Reproduction	References
UK	<i>Bucephala clangula</i>	Goldeneye	21-Feb	10-May	11-Apr	31-Jul			BirdTrack		Cramp 1977-1994
EW	<i>Bucephala clangula</i>	Goldeneye	21-Feb	30-Apr					BirdTrack		
SNI	<i>Bucephala clangula</i>	Goldeneye	01-Mar	10-May					BirdTrack		
ROI	<i>Bucephala clangula</i>	Goldeneye	21-Feb	30-Apr					Cramp 1977-1994, Hutchinson 1989		
UK	<i>Mergus serrator</i>	Red-breasted Merganser	01-Mar	30-May	21-Mar	10-Aug			BirdTrack		Campbell & Ferguson-Lees 1972
EW	<i>Mergus serrator</i>	Red-breasted Merganser	01-Mar	30-May					BirdTrack		
SNI	<i>Mergus serrator</i>	Red-breasted Merganser	01-Mar	30-May					BirdTrack		
ROI	<i>Mergus serrator</i>	Red-breasted Merganser	21-Feb	10-May	11-May	10-Sep			BirdTrack		Cramp 1977-1994, Gibbons <i>et al.</i> 1993, Hutchinson 1989, Harrison 1975
UK	<i>Mergus merganser</i>	Goosander	21-Feb	10-Jun	11-Mar	10-Sep			BirdTrack		BTO Ringing Scheme, Cramp 1977-1994
EW	<i>Mergus merganser</i>	Goosander	21-Feb	10-Jun	11-Mar	10-Sep			BirdTrack		BTO Ringing Scheme, Cramp 1977-1994
SNI	<i>Mergus merganser</i>	Goosander	01-Mar	10-Jun					BirdTrack		
ROI	<i>Mergus merganser</i>	Goosander			01-May	10-Jul					Cramp 1977-1994, Gibbons <i>et al.</i> 1993, Hutchinson 1989
UK	<i>Bonasa bonasia</i>	Hazel Grouse									
EW	<i>Bonasa bonasia</i>	Hazel Grouse									
SNI	<i>Bonasa bonasia</i>	Hazel Grouse									
ROI	<i>Bonasa bonasia</i>	Hazel Grouse									
UK	<i>Lagopus lagopus scoticus</i>	Red Grouse			11-Apr	20-Sep					BTO Ringing Scheme, Campbell & Ferguson-Lees 1972, Cramp 1977-1994
EW	<i>Lagopus lagopus scoticus</i>	Red Grouse			11-Apr	20-Sep					BTO Ringing Scheme, Campbell & Ferguson-Lees 1972, Cramp 1977-1994
SNI	<i>Lagopus lagopus scoticus</i>	Red Grouse									
ROI	<i>Lagopus lagopus scoticus</i>	Red Grouse			11-Apr	31-Aug					Cramp 1977-1994, Gibbons <i>et al.</i> 1993, Hutchinson 1989, Harrison 1975
UK	<i>Lagopus mutus</i>	Ptarmigan			11-Apr	20-Sep					Cramp 1977-1994
EW	<i>Lagopus mutus</i>	Ptarmigan									
SNI	<i>Lagopus mutus</i>	Ptarmigan			11-Apr	20-Sep					Cramp 1977-1994
ROI	<i>Lagopus mutus</i>	Ptarmigan									
UK	<i>Tetrao tetrix</i>	Black Grouse			11-Mar	31-Aug					
EW	<i>Tetrao tetrix</i>	Black Grouse									
SNI	<i>Tetrao tetrix</i>	Black Grouse									
ROI	<i>Tetrao tetrix</i>	Black Grouse									

Country		Scientific name	English name	Prenuptial migration		Reproduction		References	
				Start	End	Start	End	Prenuptial migration	Reproduction
UK	<i>Tetrao urogallus</i>	Capercaillie				01-Mar	31-Aug		Campbell & Ferguson-Lees 1972
EW	<i>Tetrao urogallus</i>	Capercaillie							
SNI	<i>Tetrao urogallus</i>	Capercaillie				01-Mar	31-Aug		Campbell & Ferguson-Lees 1972
ROI	<i>Tetrao urogallus</i>	Capercaillie							
UK	<i>Alectoris chukar</i>	Chukar							
EW	<i>Alectoris chukar</i>	Chukar							
SNI	<i>Alectoris chukar</i>	Chukar							
ROI	<i>Alectoris chukar</i>	Chukar							
UK	<i>Alectoris graeca</i>	Rock partridge							
EW	<i>Alectoris graeca</i>	Rock partridge							
SNI	<i>Alectoris graeca</i>	Rock partridge							
ROI	<i>Alectoris graeca</i>	Rock partridge							
UK	<i>Alectoris rufa</i>	Red-legged Partridge				01-Mar	20-Sep		Campbell & Ferguson-Lees 1972
EW	<i>Alectoris rufa</i>	Red-legged Partridge							
SNI	<i>Alectoris rufa</i>	Red-legged Partridge							
ROI	<i>Alectoris rufa</i>	Red-legged Partridge							
UK	<i>Alectoris barbara</i>	Barbary Partridge							
EW	<i>Alectoris barbara</i>	Barbary Partridge							
SNI	<i>Alectoris barbara</i>	Barbary Partridge							
ROI	<i>Alectoris barbara</i>	Barbary Partridge							
UK	<i>Francolinus francolinus francolinus</i>	Black Francolin							
EW	<i>Francolinus francolinus francolinus</i>	Black Francolin							
SNI	<i>Francolinus francolinus francolinus</i>	Black Francolin							
ROI	<i>Francolinus francolinus francolinus</i>	Black Francolin							
UK	<i>Perdix perdix</i>	Grey Partridge				01-Mar	31-Aug		Campbell & Ferguson-Lees 1972
EW	<i>Perdix perdix</i>	Grey Partridge							
SNI	<i>Perdix perdix</i>	Grey Partridge							
ROI	<i>Perdix perdix</i>	Grey Partridge				01-Apr	31-Jul		Cramp 1977-1994
UK	<i>Coturnix coturnix</i>	Quail				01-Apr	30-Jun	BirdTrack	Campbell & Ferguson-Lees 1972
EW	<i>Coturnix coturnix</i>	Quail				01-Apr	30-Jun	BirdTrack	
SNI	<i>Coturnix coturnix</i>	Quail							

			References				
Country	Scientific name	English name	Prenuptial migration		Reproduction		References
			Start	End	Start	End	
ROI	<i>Coturnix coturnix</i>	Quail			01-May	31-Aug	Cramp 1977–1994, Gibbons <i>et al.</i> 1993, Hutchinson 1989
UK	<i>Phasianus colchicus</i>	Pheasant			01-Mar	31-Aug	Campbell & Ferguson-Lees 1972
EW	<i>Phasianus colchicus</i>	Pheasant					Campbell & Ferguson-Lees 1972
SNI	<i>Phasianus colchicus</i>	Pheasant					Campbell & Ferguson-Lees 1972
ROI	<i>Phasianus colchicus</i>	Pheasant			21-Mar	31-Aug	Cramp 1977–1994, Gibbons <i>et al.</i> 1993, Hutchinson 1989, Harrison 1975
UK	<i>Meleagris gallopavo</i>	Wild Turkey					
EW	<i>Meleagris gallopavo</i>	Wild Turkey					
SNI	<i>Meleagris gallopavo</i>	Wild Turkey					
ROI	<i>Meleagris gallopavo</i>	Wild Turkey					
UK	<i>Rallus aquaticus</i>	Water Rail	21-Jan	30-Apr	01-May	30-Sep	BTO Ringing Scheme, Cramp 1977–1994
EW	<i>Rallus aquaticus</i>	Water Rail	21-Jan	30-Apr	01-May	30-Sep	BTO Ringing Scheme, Cramp 1977–1994
SNI	<i>Rallus aquaticus</i>	Water Rail					
ROI	<i>Rallus aquaticus</i>	Water Rail			01-Apr	31-Aug	Cramp 1977–1994, Harrison 1975
UK	<i>Gallinula chloropus</i>	Moorhen	01-Mar	30-Apr	11-Mar	20-Oct	BTO Nest Record Scheme, Cramp 1977–1994
EW	<i>Gallinula chloropus</i>	Moorhen	01-Mar	30-Apr	11-Mar	20-Oct	BTO Nest Record Scheme, Cramp 1977–1994
SNI	<i>Gallinula chloropus</i>	Moorhen	01-Mar	30-Apr			
ROI	<i>Gallinula chloropus</i>	Moorhen			01-Apr	21-Aug	Cramp 1977–1994, Gibbons <i>et al.</i> 1993, Hutchinson 1989
UK	<i>Fulica atra</i>	Coot	21-Feb	30-Apr	11-Mar	10-Oct	BTO Nest Record Scheme, Cramp 1977–1994
EW	<i>Fulica atra</i>	Coot	21-Feb	30-Apr	11-Mar	10-Oct	BTO Nest Record Scheme, Cramp 1977–1994
SNI	<i>Fulica atra</i>	Coot			21-Mar	10-Sep	BTO Nest Record Scheme, Cramp 1977–1994
ROI	<i>Fulica atra</i>	Coot	11-Feb	10-Apr	01-Mar	31-Aug	Cramp 1977–1994, Hutchinson 1989
UK	<i>Haematopus ostralegus</i>	Oystercatcher	01-Feb	10-Jun	21-Mar	31-Aug	BTO Ringing Scheme
EW	<i>Haematopus ostralegus</i>	Oystercatcher	01-Feb	10-Jun	21-Mar	31-Aug	BTO Ringing Scheme
SNI	<i>Haematopus ostralegus</i>	Oystercatcher	01-Feb	10-Jun	21-Mar	10-Aug	BTO Ringing Scheme
ROI	<i>Haematopus ostralegus</i>	Oystercatcher	01-Feb	10-May	01-Apr	31-Jul	BTO Ringing Scheme
UK	<i>Pluvialis apricaria</i>	Golden Plover	21-Feb	10-May	21-Feb	20-Aug	Pearce-Higgins & Yalden 2003

Country	Scientific name	English name	Pre-nuptial migration		Reproduction		References	
			Start	End	Start	End	Pre-nuptial migration	Reproduction
EW	<i>Pluvialis apricaria</i>	Golden Plover	21-Feb	10-May	21-Feb	20-Aug	BirdTrack	Pearce-Higgins & Yalden 2003
SNI	<i>Pluvialis apricaria</i>	Golden Plover						
ROI	<i>Pluvialis apricaria</i>	Golden Plover	01-Feb	10-May	11-Apr	10-Aug	Cramp 1977–1994, Hutchinson 1989	Cramp 1977–1994, Gibbons <i>et al.</i> 1993, Hutchinson 1989
UK	<i>Pluvialis squatarola</i>	Grey Plover	21-Feb	10-Jun			BirdTrack	
EW	<i>Pluvialis squatarola</i>	Grey Plover	21-Feb	10-Jun			BirdTrack	
SNI	<i>Pluvialis squatarola</i>	Grey Plover	21-Feb	10-Jun			BirdTrack	
ROI	<i>Pluvialis squatarola</i>	Grey Plover	11-Feb	30-May			BirdTrack	
UK	<i>Vanellus vanellus</i>	Lapwing	21-Jan	10-Apr	01-Mar	31-Aug	BTO WeBS Annual Report	BTO Ringing Scheme
EW	<i>Vanellus vanellus</i>	Lapwing	21-Jan	10-Apr	01-Mar	20-Aug	BTO WeBS Annual Report	BTO Ringing Scheme
SNI	<i>Vanellus vanellus</i>	Lapwing	21-Jan	10-Apr	01-Mar	31-Aug	BTO WeBS Annual Report	BTO Ringing Scheme
ROI	<i>Vanellus vanellus</i>	Lapwing	21-Jan	31-Mar	01-Mar	20-Jul	Cramp 1977–1994, Hutchinson 1989	BTO Ringing Scheme
UK	<i>Calidris canutus canutus</i>	Knot (of Svalbard and Taymyr origin)	21-Apr	10-Jun			BTO Ringing Scheme	
EW	<i>Calidris canutus canutus</i>	Knot (of Svalbard and Taymyr origin)	21-Apr	10-Jun			BTO Ringing Scheme	
SNI	<i>Calidris canutus canutus</i>	Knot (of Svalbard and Taymyr origin)						
ROI	<i>Calidris canutus canutus</i>	Knot (of Svalbard and Taymyr origin)						
UK	<i>Calidris canutus islandica</i>	Knot (of Greenland and north-eastern Canada origin)	21-Feb	31-May			BirdTrack	
EW	<i>Calidris canutus islandica</i>	Knot (of Greenland and north-eastern Canada origin)	21-Feb	31-May			BirdTrack	
SNI	<i>Calidris canutus islandica</i>	Knot (of Greenland and north-eastern Canada origin)	01-Mar	31-May			BirdTrack	
ROI	<i>Calidris canutus islandica</i>	Knot (of Greenland and north-eastern Canada origin)	01-Mar	20-May			Baer & Newton 2006, Cramp 1977–1994, Hutchinson 1989	
UK	<i>Calidris pugnax</i>	Ruff	11-Feb	20-May	21-Apr	31-Aug	Cramp 1977–1994	Campbell & Ferguson-Lees 1972
EW	<i>Calidris pugnax</i>	Ruff						
SNI	<i>Calidris pugnax</i>	Ruff						
ROI	<i>Calidris pugnax</i>	Ruff	11-Feb	10-May				
UK	<i>Lymnocyptes minimus</i>	Jack Snipe	11-Feb	20-May			Cramp 1977–1994, Sparks <i>et al.</i> 2006	
EW	<i>Lymnocyptes minimus</i>	Jack Snipe	11-Feb	20-May			Cramp 1977–1994, Sparks <i>et al.</i> 2006	
SNI	<i>Lymnocyptes minimus</i>	Jack Snipe	11-Feb	20-May			Cramp 1977–1994, Sparks <i>et al.</i> 2006	
ROI	<i>Lymnocyptes minimus</i>	Jack Snipe	21-Feb	10-May			Cramp 1977–1994, Sparks <i>et al.</i> 2006	
UK	<i>Gallinago gallinago</i>	Snipe	01-Mar	30-Apr	21-Mar	31-Aug		BTO Ringing Scheme

			References				
Country	Scientific name	English name	Pre-nuptial migration		Reproduction		
			Start	End	Start	End	
EW	<i>Gallinago gallinago</i>	Snipe			21-Mar	20-Jul	BTO Ringing Scheme
SNI	<i>Gallinago gallinago</i>	Snipe			21-Mar	31-Aug	BTO Ringing Scheme
ROI	<i>Gallinago gallinago</i>	Snipe	21-Jan	30-Apr	01-Apr	10-Sep	Cramp 1977–1994, Gibbons <i>et al.</i> 1993, Hutchinson 1989
UK	<i>Scolopax rusticola</i>	Woodcock	01-Mar	30-Apr	01-Mar	31-Jul	BTO Ringing Scheme
EW	<i>Scolopax rusticola</i>	Woodcock	01-Mar	30-Apr	01-Mar	31-Jul	BTO Ringing Scheme
SNI	<i>Scolopax rusticola</i>	Woodcock	01-Mar	30-Apr	01-Mar	20-Jul	BTO Ringing Scheme
ROI	<i>Scolopax rusticola</i>	Woodcock	11-Feb	10-Apr	01-Mar	10-Sep	Cramp 1977–1994, Gibbons <i>et al.</i> 1993, Hutchinson 1989
UK	<i>Limosa limosa</i>	Black-tailed Godwit	21-Jan	10-May	11-Mar	10-Jul	BTO Ringing Scheme, Smart pers. comm.
EW	<i>Limosa limosa</i>	Black-tailed Godwit	21-Jan	10-May	11-Mar	10-Jul	BTO Ringing Scheme, Smart pers. comm.
SNI	<i>Limosa limosa</i>	Black-tailed Godwit	21-Jan	10-May			
ROI	<i>Limosa limosa</i>	Black-tailed Godwit	01-Feb	20-May	11-Apr	20-Jun	Cramp 1977–1994, Gill <i>et al.</i> 2014
UK	<i>Limosa lapponica</i>	Bar-tailed Godwit	11-Mar	10-Jun			BTO WebS Annual Report
EW	<i>Limosa lapponica</i>	Bar-tailed Godwit	11-Mar	10-Jun			BTO WebS Annual Report
SNI	<i>Limosa lapponica</i>	Bar-tailed Godwit	11-Mar	10-Jun			BTO WebS Annual Report
ROI	<i>Limosa lapponica</i>	Bar-tailed Godwit	01-Feb	30-May			Cramp 1977–1994, Hutchinson 1989
UK	<i>Numenius phaeopus</i>	Whimbrel	01-Apr	10-Jun	21-Apr	10-Aug	BTO Ringing Scheme, Campbell & Ferguson-Lees
EW	<i>Numenius phaeopus</i>	Whimbrel	01-Apr	10-Jun			
SNI	<i>Numenius phaeopus</i>	Whimbrel	10-Apr	10-Jun	21-Apr	10-Aug	Campbell & Ferguson-Lees 1972
ROI	<i>Numenius phaeopus</i>	Whimbrel	01-Apr	30-May			
UK	<i>Numenius arquata</i>	Curlew	10-Feb	20-May	21-Feb	20-Aug	BTO Nest Record Scheme, Cramp 1977–1994
EW	<i>Numenius arquata</i>	Curlew	10-Feb	10-May	21-Feb	20-Aug	BTO Nest Record Scheme, Cramp 1977–1994
SNI	<i>Numenius arquata</i>	Curlew	01-Mar	20-May	21-Feb	10-Aug	BTO Ringing Scheme, Cramp 1977–1994
ROI	<i>Numenius arquata</i>	Curlew	01-Feb	10-Apr	01-Apr	31-Aug	Cramp 1977–1994, Gibbons <i>et al.</i> 1993, Hutchinson 1989
UK	<i>Tringa erythropus</i>	Spotted Redshank	01-Mar	31-May			
EW	<i>Tringa erythropus</i>	Spotted Redshank					
SNI	<i>Tringa erythropus</i>	Spotted Redshank					
ROI	<i>Tringa erythropus</i>	Spotted Redshank	21-Feb	10-May			Hutchinson 1989

Country	Scientific name	English name	Pre-nuptial migration		Reproduction		References	
			Start	End	Start	End	Pre-nuptial migration	Reproduction
UK	<i>Tringa totanus</i>	Redshank	01-Feb	30-Apr	21-Mar	20-Jul	Cramp 1977-1994, Jenkins & Sparks 2010	BTO Ringing Scheme, Campbell & Ferguson-Lees
EW	<i>Tringa totanus</i>	Redshank	01-Feb	30-Apr	21-Mar	20-Jul	Cramp 1977-1994, Jenkins & Sparks 2010	BTO Ringing Scheme, Campbell & Ferguson-Lees
SNI	<i>Tringa totanus</i>	Redshank	01-Feb	30-Apr	21-Mar	10-Jul	Cramp 1977-1994, Jenkins & Sparks 2010	BTO Ringing Scheme, Campbell & Ferguson-Lees
ROI	<i>Tringa totanus</i>	Redshank	21-Jan	20-Apr	21-Mar	10-Jul	Cramp 1977-1994, Jenkins & Sparks 2010	BTO Ringing Scheme
UK	<i>Tringa nebularia</i>	Greenshank	11-Mar	20-May	21-Apr	31-Jul	Cramp 1977-1994	Campbell & Ferguson-Lees 1972
EW	<i>Tringa nebularia</i>	Greenshank						
SNI	<i>Tringa nebularia</i>	Greenshank			21-Apr	31-Jul		Campbell & Ferguson-Lees 1972
ROI	<i>Tringa nebularia</i>	Greenshank	11-Mar	10-May			Cramp 1977-1994, Hutchinson 1989	
UK	<i>Chroicocephalus ridibundus</i>	Black-headed Gull	11-Feb	10-May	01-Apr	10-Aug	Cramp 1977-1994, Jenkins & Sparks 2010	BTO Ringing Scheme, Cramp 1977-1994
EW	<i>Chroicocephalus ridibundus</i>	Black-headed Gull	11-Feb	10-May	01-Apr	10-Aug	Cramp 1977-1994, Jenkins & Sparks 2010	BTO Ringing Scheme, Cramp 1977-1994
SNI	<i>Chroicocephalus ridibundus</i>	Black-headed Gull	11-Feb	10-May	01-Apr	31-Jul	Cramp 1977-1994, Jenkins & Sparks 2010	BTO Ringing Scheme, Cramp 1977-1994
ROI	<i>Chroicocephalus ridibundus</i>	Black-headed Gull	11-Feb	30-Apr	01-Apr	20-Jul	Cramp 1977-1994, Jenkins & Sparks 2010	BTO Ringing Scheme, Cramp 1977-1994
UK	<i>Larus canus</i>	Common Gull	21-Feb	31-May	21-Mar	31-Jul	Cramp 1977-1994	BTO Ringing Scheme, Cramp 1977-1994
EW	<i>Larus canus</i>	Common Gull					Cramp 1977-1994	
SNI	<i>Larus canus</i>	Common Gull			21-Mar	31-Jul	Cramp 1977-1994	BTO Ringing Scheme, Cramp 1977-1994
ROI	<i>Larus canus</i>	Common Gull	01-Mar	10-May	21-Mar	20-Jul	Cramp 1977-1994, Hutchinson 1989	BTO Ringing Scheme, Cramp 1977-1994
UK	<i>Larus fuscus</i>	Lesser Black-backed Gull	01-Feb	31-May	21-Apr	20-Aug	BTO WeBS Annual Report	BTO Ringing Scheme, Cramp 1977-1994
EW	<i>Larus fuscus</i>	Lesser Black-backed Gull	01-Feb	31-May	21-Apr	20-Aug	BTO WeBS Annual Report	BTO Ringing Scheme, Cramp 1977-1994
SNI	<i>Larus fuscus</i>	Lesser Black-backed Gull	01-Feb	31-May	21-Apr	10-Aug	BTO WeBS Annual Report	BTO Ringing Scheme, Cramp 1977-1994
ROI	<i>Larus fuscus</i>	Lesser Black-backed Gull	11-Feb	30-Apr	11-Apr	31-Jul	Cramp 1977-1994, Hutchinson 1989	BTO Ringing Scheme, Cramp 1977-1994
UK	<i>Larus argentatus</i>	Herring Gull	11-Feb	20-May	11-Apr	31-Aug	Cramp 1977-1994	Campbell & Ferguson-Lees 1972
EW	<i>Larus argentatus</i>	Herring Gull						
SNI	<i>Larus argentatus</i>	Herring Gull						
ROI	<i>Larus argentatus</i>	Herring Gull	01-Feb	30-Apr	21-Apr	10-Aug		Cramp 1977-1994, Lloyd <i>et al.</i> 1991, Harrison 1975
UK	<i>Larus michahellis</i>	Yellow-legged Gull	11-Feb	30-Apr			BTO WeBS Annual Report	
EW	<i>Larus michahellis</i>	Yellow-legged Gull	11-Feb	30-Apr			BTO WeBS Annual Report	
SNI	<i>Larus michahellis</i>	Yellow-legged Gull						
ROI	<i>Larus michahellis</i>	Yellow-legged Gull						
UK	<i>Larus cachinnans</i>	Caspian Gull						

			References					
Country	Scientific name	English name	Pre-nuptial migration		Reproduction		References	
			Start	End	Start	End		
EW	<i>Larus cachinnans</i>	Caspian Gull						
SNI	<i>Larus cachinnans</i>	Caspian Gull						
ROI	<i>Larus cachinnans</i>	Caspian Gull						
UK	<i>Larus marinus</i>	Great Black-backed Gull	11-Feb	10-May	21-Mar	20-Aug	Cramp 1977-1994	BTO Ringing Scheme, Cramp 1977-1994
EW	<i>Larus marinus</i>	Great Black-backed Gull			21-Mar	20-Aug		BTO Ringing Scheme, Cramp 1977-1994
SNI	<i>Larus marinus</i>	Great Black-backed Gull			01-Apr	20-Aug		BTO Ringing Scheme, Cramp 1977-1994
ROI	<i>Larus marinus</i>	Great Black-backed Gull	21-Feb	20-Apr	01-Apr	31-Aug	Cramp 1977-1994	BTO Ringing Scheme, Cramp 1977-1994
UK	<i>Columba livia</i>	Rock Dove			01-Apr	30-Sep		BTO Ringing Scheme, Cramp 1977-1994
EW	<i>Columba livia</i>	Rock Dove						
SNI	<i>Columba livia</i>	Rock Dove			01-Apr	30-Sep		BTO Ringing Scheme, Cramp 1977-1994
ROI	<i>Columba livia</i>	Rock Dove			21-Feb	10-Dec		Cramp 1977-1994, Gibbons <i>et al.</i> 1993, Hutchinson 1989, Harrison 1975
UK	<i>Columba oenas</i>	Stock Dove	01-Feb	30-Apr	21-Mar	20-Nov	Cramp 1977-1994	BTO Nest Record Scheme, Cramp 1977-1994
EW	<i>Columba oenas</i>	Stock Dove			21-Mar	10-Nov		BTO Nest Record Scheme, Cramp 1977-1994
SNI	<i>Columba oenas</i>	Stock Dove			21-Mar	20-Nov		BTO Nest Record Scheme, Cramp 1977-1994
ROI	<i>Columba oenas</i>	Stock Dove			01-Mar	10-Oct		Cramp 1977-1994, Gibbons <i>et al.</i> 1993, Hutchinson 1989
UK	<i>Columba palumbus</i>	Woodpigeon	01-Feb	10-May	11-Mar	31-Oct	Cramp 1977-1994, Sparks <i>et al.</i> 2006	BTO Nest Record Scheme, Cramp 1977-1994
EW	<i>Columba palumbus</i>	Woodpigeon	11-Feb	10-May	11-Mar	31-Oct	Cramp 1977-1994, Sparks <i>et al.</i> 2006	BTO Nest Record Scheme, Cramp 1977-1994
SNI	<i>Columba palumbus</i>	Woodpigeon	01-Feb	31-Mar	11-Mar	31-Oct	Cramp 1977-1994, Sparks <i>et al.</i> 2006	BTO Nest Record Scheme, Cramp 1977-1994
ROI	<i>Columba palumbus</i>	Woodpigeon	01-Feb	31-Mar	11-Mar	31-Oct		BTO Ringing Scheme, Cramp 1977-1994
UK	<i>Streptopelia decaocto</i>	Collared Dove			11-Feb	20-Sep		BTO Nest Record Scheme, Cramp 1977-1994
EW	<i>Streptopelia decaocto</i>	Collared Dove			11-Feb	20-Sep		BTO Nest Record Scheme, Cramp 1977-1994
SNI	<i>Streptopelia decaocto</i>	Collared Dove			11-Mar	20-Sep		BTO Nest Record Scheme, Cramp 1977-1994
ROI	<i>Streptopelia decaocto</i>	Collared Dove			01-Mar	30-Sep		Cramp 1977-1994, Harrison 1975

			References				
Country	Scientific name	English name	Prenuptial migration		Reproduction		References
			Start	End	Start	End	
UK	<i>Streptopelia turtur</i>	Turtle Dove	11-Apr	31-May	01-May	20-Sep	BirdTrack BTO Nest Record Scheme, Campbell & Ferguson-Lees 1972
EW	<i>Streptopelia turtur</i>	Turtle Dove	11-Apr	31-May	01-May	20-Sep	BirdTrack BTO Nest Record Scheme, Campbell & Ferguson-Lees 1972
SNI	<i>Streptopelia turtur</i>	Turtle Dove					
ROI	<i>Streptopelia turtur</i>	Turtle Dove	21-Apr	10-Jun			Loxton & Sparks 1999, Pearce-Higgins & Green 2014, Sparks <i>et al.</i> 2007
UK	<i>Alauda arvensis</i>	Sskylark	01-Feb	20-May	11-Mar	20-Aug	BirdTrack BTO Nest Record Scheme, Campbell & Ferguson-Lees 1972
EW	<i>Alauda arvensis</i>	Sskylark	01-Feb	20-Apr	11-Mar	20-Aug	BirdTrack BTO Nest Record Scheme, Campbell & Ferguson-Lees 1972
SNI	<i>Alauda arvensis</i>	Sskylark	01-Feb	20-May	11-Mar	10-Aug	BirdTrack BTO Ringing Scheme, Campbell & Ferguson-Lees
ROI	<i>Alauda arvensis</i>	Sskylark	01-Mar	20-Apr	21-Feb	31-Jul	BirdTrack Cramp 1977–1994, Gibbons <i>et al.</i> 1993, Hutchinson 1989
UK	<i>Turdus merula</i>	Blackbird	11-Feb	10-May	01-Mar	31-Jul	Cramp 1977–1994, Pearce-Higgins & Green 2014, Sparks <i>et al.</i> 2006 BTO Nest Record Scheme, Cramp 1977–1994
EW	<i>Turdus merula</i>	Blackbird	11-Feb	10-May	01-Mar	31-Jul	Cramp 1977–1994, Pearce-Higgins & Green 2014, Sparks <i>et al.</i> 2006 BTO Nest Record Scheme, Cramp 1977–1994
SNI	<i>Turdus merula</i>	Blackbird	11-Feb	10-May	11-Mar	20-Jul	Cramp 1977–1994, Pearce-Higgins & Green 2014, Sparks <i>et al.</i> 2006 BTO Nest Record Scheme, Cramp 1977–1994
ROI	<i>Turdus merula</i>	Blackbird	11-Feb	20-Apr	01-Mar	31-Jul	Cramp 1977–1994, Pearce-Higgins & Green 2014, Sparks <i>et al.</i> 2006 BTO Ringing Scheme, Cramp 1977–1994
UK	<i>Turdus pilaris</i>	Fieldfare	21-Jan	10-May	21-Apr	20-Aug	BirdTrack Cramp 1977–1994
EW	<i>Turdus pilaris</i>	Fieldfare	21-Jan	20-Apr			BirdTrack
SNI	<i>Turdus pilaris</i>	Fieldfare	21-Jan	10-May			BirdTrack
ROI	<i>Turdus pilaris</i>	Fieldfare	21-Feb	30-Apr			BirdTrack
UK	<i>Turdus philomelos</i>	Song Thrush	01-Mar	20-May	01-Mar	31-Jul	Cramp 1977–1994, Jenkins & Sparks 2010 BTO Nest Record Scheme, Cramp 1977–1994
EW	<i>Turdus philomelos</i>	Song Thrush	01-Mar	20-May	01-Mar	31-Jul	Cramp 1977–1994, Jenkins & Sparks 2010 BTO Nest Record Scheme, Cramp 1977–1994
SNI	<i>Turdus philomelos</i>	Song Thrush	01-Mar	20-May	11-Mar	20-Jul	Cramp 1977–1994, Jenkins & Sparks 2010 BTO Nest Record Scheme, Cramp 1977–1994
ROI	<i>Turdus philomelos</i>	Song Thrush	31-Mar	10-May	01-Mar	30-Jun	Cramp 1977–1994, Jenkins & Sparks 2010 BTO Ringing Scheme, Cramp 1977–1994
UK	<i>Turdus iliacus</i>	Redwing	21-Jan	10-May	11-Apr	31-Jul	BirdTrack Cramp 1977–1994
EW	<i>Turdus iliacus</i>	Redwing	21-Jan	20-Apr			BirdTrack

			References				
Country	Scientific name	English name	Pre-nuptial migration		Reproduction		
			Start	End	Start	End	
SNI	<i>Turdus iliacus</i>	Redwing	21-Jan	10-May	11-Apr	31-Jul	BirdTrack Cramp 1977–1994
ROI	<i>Turdus iliacus</i>	Redwing	21-Jan	20-Apr			BirdTrack
UK	<i>Turdus viscivorus</i>	Mistle Thrush	21-Jan	30-Apr	21-Feb	20-Jul	Cramp 1977–1994, Jenkins & Sparks 2010
EW	<i>Turdus viscivorus</i>	Mistle Thrush	21-Jan	30-Apr	21-Feb	20-Jul	Cramp 1977–1994, Jenkins & Sparks 2010
SNI	<i>Turdus viscivorus</i>	Mistle Thrush	21-Jan	30-Apr	11-Mar	20-Jul	Cramp 1977–1994, Jenkins & Sparks 2010
ROI	<i>Turdus viscivorus</i>	Mistle Thrush	01-Feb	10-Apr	01-Mar	20-Jun	Cramp 1977–1994, Jenkins & Sparks 2010
UK	<i>Garrulus glandarius</i>	Jay			21-Mar	10-Aug	BTO Nest Record Scheme, Cramp 1977–1994
EW	<i>Garrulus glandarius</i>	Jay			21-Mar	10-Aug	BTO Nest Record Scheme, Cramp 1977–1994
SNI	<i>Garrulus glandarius</i>	Jay					
ROI	<i>Garrulus glandarius</i>	Jay			11-Apr	31-Jul	Cramp 1977–1994, Harrison 1975
UK	<i>Pica pica</i>	Magpie			01-Mar	31-Aug	BTO Nest Record Scheme, Cramp 1977–1994
EW	<i>Pica pica</i>	Magpie			01-Mar	31-Aug	BTO Nest Record Scheme, Cramp 1977–1994
SNI	<i>Pica pica</i>	Magpie					
ROI	<i>Pica pica</i>	Magpie			01-Apr	10-Jul	Cramp 1977–1994, Gibbons <i>et al.</i> 1993, Hutchinson 1989, Harrison 1975
UK	<i>Corvus monedula</i>	Jackdaw	11-Feb	10-Apr	11-Mar	20-Aug	Cramp 1977–1994, Sparks <i>et al.</i> 2006
EW	<i>Corvus monedula</i>	Jackdaw	11-Feb	10-Apr	11-Mar	20-Aug	Cramp 1977–1994, Sparks <i>et al.</i> 2006
SNI	<i>Corvus monedula</i>	Jackdaw	11-Feb	10-Apr	11-Mar	20-Aug	Cramp 1977–1994, Sparks <i>et al.</i> 2006
ROI	<i>Corvus monedula</i>	Jackdaw			11-Mar	20-Aug	BTO Ringing Scheme, Cramp 1977–1994
UK	<i>Corvus frugilegus</i>	Rook	11-Feb	10-Apr	11-Feb	10-Aug	Cramp 1977–1994, Sparks <i>et al.</i> 2006
EW	<i>Corvus frugilegus</i>	Rook	11-Feb	10-Apr	11-Feb	10-Aug	Cramp 1977–1994, Sparks <i>et al.</i> 2006
SNI	<i>Corvus frugilegus</i>	Rook	11-Feb	10-Apr	11-Feb	20-Jul	Cramp 1977–1994, Sparks <i>et al.</i> 2006
ROI	<i>Corvus frugilegus</i>	Rook			01-Feb	10-Jun	Cramp 1977–1994, Gibbons <i>et al.</i> 1993, Hutchinson 1989
UK	<i>Corvus corone</i>	Carrion Crow & Hooded Crow			21-Feb	20-Aug	BTO Nest Record Scheme, Cramp 1977–1994

		References					
Country	Scientific name	English name	Prenuptial migration		Reproduction		
			Start	End	Start	End	
EW	<i>Corvus corone</i>	Carrion Crow & Hooded Crow			21-Feb	31-Jul	Prenuptial migration BTO Nest Record Scheme, Cramp 1977-1994
SNI	<i>Corvus corone</i>	Carrion Crow & Hooded Crow			11-Mar	20-Aug	BTO Ringing Scheme, Cramp 1977-1994
ROI	<i>Corvus corone</i>	Carrion Crow & Hooded Crow			11-Mar	10-Jul	Cramp 1977-1994, Gibbons <i>et al.</i> 1993, Hutchinson 1989, Harrison 1975
UK	<i>Sturnus vulgaris</i>	Starling	01-Feb	30-Apr	21-Mar	31-Jul	Cramp 1977-1994, Sparks <i>et al.</i> 2006 BTO Nest Record Scheme, Cramp 1977-1994
EW	<i>Sturnus vulgaris</i>	Starling	01-Feb	30-Apr	21-Mar	31-Jul	Cramp 1977-1994, Sparks <i>et al.</i> 2006 BTO Nest Record Scheme, Cramp 1977-1994
SNI	<i>Sturnus vulgaris</i>	Starling	01-Feb	30-Apr	01-Apr	31-Jul	Cramp 1977-1994, Sparks <i>et al.</i> 2006 BTO Nest Record Scheme, Cramp 1977-1994
ROI	<i>Sturnus vulgaris</i>	Starling	01-Jan	30-Apr	21-Mar	20-Jul	Cramp 1977-1994, Sparks <i>et al.</i> 2006 BTO Nest Record Scheme, Cramp 1977-1994

APPENDIX 3

Species where our assessment of a) migration period and b) breeding period differs from the previous assessment by more than one 10-day period. Values in the Start and End columns indicates by how many 10-day periods our assessment is earlier (negative values) or later (positive values) than the previous assessment. The method and source used to derive the new figure is given.

a) migration period

English name	Country	Start	End	Method	Reference
Taiga Bean Goose	UK	-3		Literature	Mitchell <i>et al.</i> 2016
Pink-footed Goose	UK	-2		Data	BirdTrack
Brent Goose (light-bellied of Nearctic origin)	ROI	-2	2	Data	BirdTrack
Wigeon	ROI	4	4	Data	BirdTrack
Mallard	UK		3	Data	BirdTrack
Garganey	UK		3	Data	BirdTrack
Shoveler	UK		2	Data	WeBS Annual Report
Goldeneye	UK		3	Data	BirdTrack
Water Rail	UK	-2		Data	WeBS Annual Report
Grey Plover	ROI		5	Data	BirdTrack
Knot (of Greenland and north-eastern Canada origin)	UK	-3		Data	BirdTrack
Whimbrel	UK	3		Data	BirdTrack
Skylark	UK		2	Data	BirdTrack
Skylark	ROI	3		Data	BirdTrack
Fieldfare	UK	-3		Data	BirdTrack
Redwing	UK	-3	-3	Data	BirdTrack
Redwing	ROI	-3	-2	Data	BirdTrack
Mistle Thrush	UK	-2		Phenological trend	Jenkins & Sparks 2010
Mistle Thrush	ROI	-2		Phenological trend	Jenkins & Sparks 2010

Species where our assessment of a) migration period and b) breeding period differs from the previous assessment by more than one 10-day period. Values in the Start and End columns indicates by how many 10-day periods our assessment is earlier (negative values) or later (positive values) than the previous assessment. The method and source used to derive the new figure is given.

b) breeding period

English name	Country	Start	End	Method	Reference
Mute Swan	UK		3	Data	Nest Record Scheme
Greylag Goose	UK	-2		Data	Nest Record Scheme
Gadwall	UK		3	Data	Ringing Scheme
Pochard	UK		3	Data	Ringing Scheme
Tufted Duck	UK	-2		Data	Nest Record Scheme
Goosander	UK		3	Data	Ringing Scheme
Red Grouse	UK		4	Data	Ringing Scheme
Water Rail	UK	4	2	Data	Nest Record Scheme
Moorhen	UK		5	Data	Nest Record Scheme
Coot	UK		2	Data	Nest Record Scheme
Golden Plover	UK		2	Literature	Pearce-Higgins & Yalden 2003
Lapwing	ROI		-5	Data	Ringing Scheme
Snipe	UK		-2	Data	Ringing Scheme
Woodcock	UK		-4	Data	Ringing Scheme
Redshank	ROI		-2	Data	Ringing Scheme
Black-headed Gull	UK		-3	Data	Ringing Scheme
Common Gull	UK	-2	-3	Data	Ringing Scheme
Common Gull	ROI	-4		Data	Ringing Scheme
Lesser Black-backed Gull	UK		-2	Data	Ringing Scheme
Great Black-backed Gull	UK	-2		Data	Ringing Scheme
Great Black-backed Gull	ROI	-2	2	Data	Ringing Scheme
Stock Dove	UK	2	2	Data	Nest Record Scheme
Woodpigeon	UK	2		Data	Nest Record Scheme
Woodpigeon	ROI	3		Data	Nest Record Scheme
Collared Dove	UK		-5	Data	Nest Record Scheme
Turtle Dove	UK		-2	Data	Nest Record Scheme
Blackbird	UK		-5	Data	Nest Record Scheme
Blackbird	ROI		-3	Data	Ringing Scheme
Song Thrush	UK		-5	Data	Nest Record Scheme
Song Thrush	ROI		-4	Data	Ringing Scheme
Mistle Thrush	ROI		-4	Data	Ringing Scheme
Jay	UK	-2	2	Data	Nest Record Scheme
Magpie	UK		4	Data	Nest Record Scheme
Jackdaw	UK	-2	4	Data	Nest Record Scheme
Jackdaw	ROI	-3	4	Data	Ringing Scheme
Rook	UK	-2	4	Data	Ringing Scheme
Carrion Crow & Hooded Crow	UK	-2	3	Data	Nest Record Scheme



Image: Curlew, by Alan Price.

Updating information on the period of reproduction and prenuptial migration for UK and Irish species included on Annex II of the EU Birds Directive

Article 7(1) of the European Union's Directive 2009/147/EC on the conservation of wild birds allows for the hunting of species included within Annex II, where such hunting does not jeopardise conservation efforts. Article 7(4) of the Birds Directive further clarifies that species should not be hunted during their reproductive period or, if the species are migratory, during their prenuptial migration. To ensure effective implementation of these requirements, the European Commission requires Member States to identify the extent of the reproductive period and, where applicable, the timing of prenuptial migration for species included on Annex II that occur on their territory. A review of the best available information on the period of prenuptial migration and reproduction of each huntable species, for each Member State where that species occurs, was first carried out in 2001. The review was updated in 2009 and again in 2014, primarily to fill in missing data, especially for new Member States, but also to address inconsistencies within the species information available. This research report uses the latest BTO information to provide a further update.

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