Huntable bird species under the Birds Directive - Scientific overview of the periods of return to their rearing grounds and of reproduction in the Member States

Volume 1[1]

[1] The Volume 2 ("References provided by the Member States for the reported periods") is accessible on the European Commission website (DG Environment)

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1. Objective of the Document

This document presents an up to date scientific overview of information on the timing of the reproduction period and of prenuptial migration (i.e. return to the rearing grounds) for 82 bird species or subspecies listed in Annex II of the Directive 2009/147/EC on the conservation of wild birds[2] (hereinafter the "Birds Directive"). Annex II of the Birds Directive lists those bird species that, owing to their population level, geographic distribution and reproductive rate, may be hunted throughout the EU (part A) or in the particular Member States in respect to which they are indicated (part B).

Article 7(4) of the Birds Directive lays down a number of key principles, the objective of which is to ensure that hunting does not take place during the most vulnerable periods of the annual cycle of bird species. For sedentary species, it requires that they are not hunted during their rearing season nor during the various stages of reproduction. In the case of migratory species, it requires that they are not hunted during their period of reproduction and during their return to their rearing grounds.

The first scientific overview, referred to as the "Key Concepts of Article 7(4) of Directive 79/409/EEC", was published in September 2001. The document was updated in 2009 and 2014[3] to take into account accessions of new Member States to the EU. The 2014 version of the Key Concepts Document highlighted the need for all Member States to improve the quality of the data.

The Commission undertook to update the Key Concepts document in order to take into account the latest scientific knowledge on the subject, as a key action under the Action Plan for nature, people and the economy[4] aimed at improving guidance and knowledge.

This update incorporates the most up-to-date scientific data, supported by relevant references, and aims in particular to achieve better consistency and coherence between the reported data from Member States. It has been developed through close co-operation between the Commission, Member States and key stakeholder groups.

The earlier start of spring migration and breeding is a global phenomenon. Studies in Europe and North America show a significant advancement of spring migration (e.g. Koleček et al 2020, Lehikoinen et al 2019). This and climate-induced changes in distributions (e.g. Virkkala et al 2017) indicate that whilst the data presented here provides a good picture of the current situation, there is a continuing need for regular review and update[5]. Future updates will also offer opportunities to address the remaining discrepancies between Member States, partly due to current knowledge gaps.

2. Context

The need for the information on the timing of the reproduction period and of the prenuptial migration period of Annex II bird species arose from a Court of Justice judgement in 1994[6]. The Court concluded that the closing date for the hunting of migratory birds and waterfowl must be fixed in accordance with a method

[2] OJ L 20 of 26.01.2010. p. 7.

[3] The August 2014 version is available on the Commission website: Key concepts of Article 7(4) of Directive 2009/147/EC

[4] COM(2017) 198 final, An Action Plan for nature, people and the economy , Actions in the Action Plan for nature, people and the economy

[5] The Court has in the Case T-562/15 confirmed that the Commission is not obliged to update the KC document, but this is rather a common duty of all parties involved (points 88 and 91 of the Case).

[6] Case C-435/92, Association pour la protection des animaux sauvages and other v Préfet de Maine-et-Loire and Préfet de Loire-Atlantique. Reference for a preliminary ruling: Tribunal Administratif de Nantes, France. European Court Reports, 1994, page I-0067.
This case also highlighted other difficulties in applying Article 7(4) linked to staggered closing dates (different closing dates for different species). These are the risk of confusion between different species, which may lead to the shooting of species for which the hunting is already closed. There is also the risk of disturbance caused by hunting to other bird species for which hunting has already closed. These elements are not covered by the Key Concepts document but by the 2008 Guidance document on Sustainable Hunting under the Birds Directive.
http://ec.europa.eu/environment/nature/conservation/wildbirds/action_plans/guidance_en.htm.

that guarantees **complete protection** of those species during the period of prenuptial migration.

Although the Court only examined the question of fixing closing dates for the hunting season of migratory species, a matter which concerns the start of the prenuptial migration, its interpretation (namely the requirement of 'complete protection') is equally relevant to the fixing of opening dates, a matter related to the end of the period of reproduction.

The Court of Justice of the European Union also stated in Case C-157/89 that "*the second and third sentences of Article 7(4) of the Directive are designed to secure a complete system of protection in the periods during which the survival of wild birds is particularly under threat. Consequently, protection against hunting activities cannot be confined to the majority of birds of a given species, as determined by average reproductive cycles and migratory movements*".[7]

Furthermore, the Court ruled in Case C-435/92 that "*Methods whose object or effect is to allow a certain percentage of the birds of a species to escape [complete] protection [during the period of pre-mating migration] do not comply with [Article 7(4) of Council Directive 79/409/EEC]*."[8] According to the Case C-38/99[9], the Directive "*requires total cessation of hunting as soon as migration begins, save in exceptional cases (isolated specimens commencing migration)*"[10].

These principles underline the need to consider variations in reproductive cycles and migratory movements over time based on the whole population of a given species. It can also be inferred from this case law that there is a need to apply the precautionary principle in case of uncertainties or knowledge gaps.

The "Guidance Document on hunting under Council Directive 79/409/EEC on the Conservation of Wild Birds"[11] ("Sustainable Hunting Guide") provides guidance on fixing hunting seasons (Chapter 2.5.), assuring a system of complete protection (Chapter 2.6.) and addressing overlaps between hunting season and prenuptial/reproduction seasons (Chapter 2.7.). The present document complements the Sustainable Hunting Guide as regards the interpretation and application of Article 7(4) of the Birds Directive. It also forms part of a broader initiative on sustainable hunting under the Birds Directive which the Commission initiated in 2001 with the Member States, the Federation of Associations for Hunting and Conservation of the EU (FACE) and BirdLife International[12].

3. Definitions

Initial discussions between the Commission and scientific experts of the Member States[13] in November 1998 agreed the following working definitions concerning both the period of reproduction and the period of return to rearing grounds. These same definitions have been used in the current update.

3.1 Reproduction period

The '**reproduction period**'[14] not only covers the breeding season but also includes the occupation of the breeding areas as well as the period of dependence of young birds after leaving the nest.

[7] Judgment of 17 January 1991, Commission/Italy, Case C-157/89, ECR 1991, p.57, paragraph 14. There are also references to the concept of complete protection in the following judgements: 19 January 1994, Association pour la Protection des Animaux Sauvages and others v Préfet de Maine-et-Loire and Préfet de Loire-Atlantique, case C-435/92, ECR 1994, p.67 and judgment of 7 December 2000, Commission/France, case C-38/99, ECR 2000, p.10941

[8] Paragraph 13 of Case C-435/92.

[9] Judgment of the Court (Sixth Chamber) of 7 December 2000. - Commission of the European Communities v French Republic.

[10] Paragraph 34 of Case C-38/99.

[11] Sustainable Hunting Guide

[12] Sustainable hunting initiatives

[13] Within the framework of the ORNIS Committee's Scientific Working Group

[14] Note that Article 7(4) refers both to 'rearing season' and 'the various stages of reproduction' (cf. French version *'les différents stades de*

'Rearing season' or '**Breeding season'**[15] is defined using the definition of Cramp & Simmons (1977)[16]: "*the breeding season is the period during which a species lays and incubates its eggs and rears it young to the flying stage.*"

The following scheme, which deals with the different stages of reproduction, was agreed as an appropriate general scheme for the period of reproduction. The sequence and importance of the elements of this general scheme may vary from one species to another, according to differences in breeding biology.

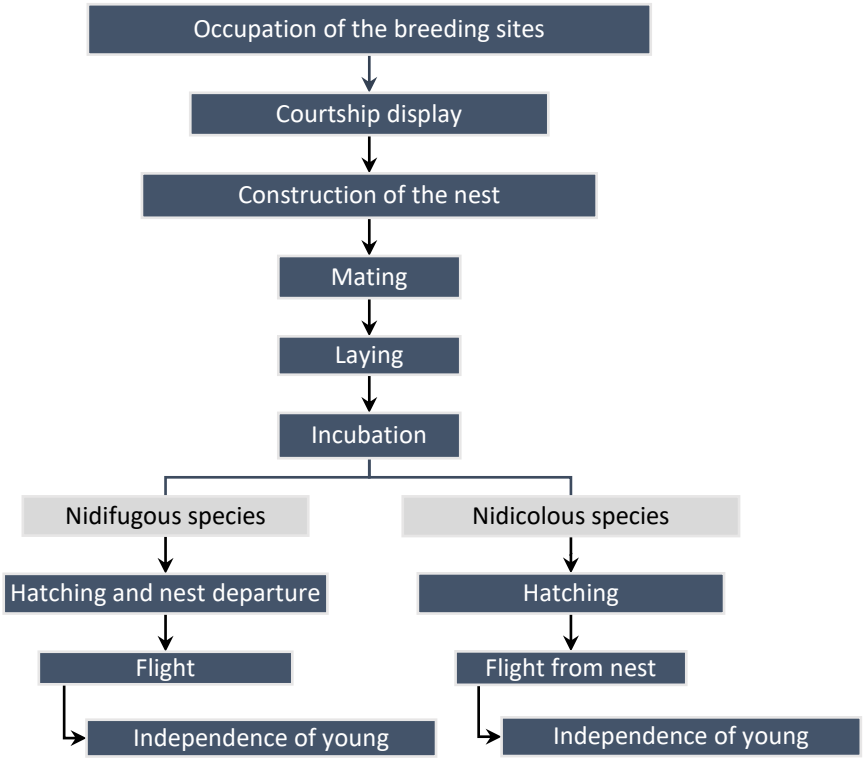

Figure 1. Different stages of reproduction

In summary, the reproduction period covers the occupation of breeding sites, the breeding season, and the period of dependence of young birds.[17]

In Case C-507/04[18], the Court of Justice of the EU clarified that there is no legal basis for the distinction between males and females in the Directive's provisions relating to the scope of the protection that wild birds must enjoy. In case C-161/19, the Court further confirmed that the population of the species is defined as all the individuals which constitute a breeding community[19] and that the protection of wild birds during nesting periods and the different stages of reproduction under Article 7 (4) of the Birds Directive is aimed at both males and females[20].

reproduction et de dépendance'; German version *'Einzelnen Phasen der Brut - und Aufzuchtzeit*')

[15] This term is considered equal and better English than the term 'rearing season' used in Article 7(4).

[16] Cramp, S. & Simmons, K.E.L. (eds). 1977. Birds of the Western Palearctic, Volume 1. Oxford, Oxford University Press. 722 pp.

[17] The period of reproduction is not considered completed until the young can fly.

[18] Paragraph 241.

[19] Paragraph 50.

[20] Paragraph 55.

3.2 Period of return to the rearing grounds

Return to the rearing grounds is an annual displacement, in one of more stages, of migratory birds from their wintering areas back to their nesting grounds. The wintering period ends with the departure from wintering areas where migrant birds have been more or less stationary since the end of the post-nuptial (autumn) migration. The return to the rearing grounds is commonly called “prenuptial migration”.

In Europe, prenuptial migration movements are mostly directed north, northeast or northwest. This means that migrants from African winter quarters first cross the Mediterranean, then pass through southern and central Europe on their way to their northern European breeding areas. This migration normally takes several weeks (including breaks at resting places on the way) but individual birds can complete the journey in one or a few days. The determination of the start, end, and length of the migration season in a particular country are determined by a number of biological, geographical, and methodological factors.

Regarding the beginning of the prenuptial migration, not all individuals of a species within the same wintering region end their wintering period at the same time. A wintering area may support birds originating from different populations and having different annual cycles. Birds belonging to populations breeding further north, for example, often start their prenuptial flight much later than birds breeding more to the south. Furthermore, so-called “leapfrog” migration may occur where the northern breeding element of a population migrates to winter quarters that lie further to the south than those occupied by the southern breeding element of that population. This applies to a species such as the Redshank (*Tringa totanus*).

The fact that birds leave a wintering area does not necessarily mean that they start their prenuptial migration. They can move to other wintering quarters because of changes in local ecological conditions, exhaustion of food resources, disturbance or changes in weather conditions. When migratory and sedentary birds of the same species coexist on the same wintering grounds, the identification of the start of their prenuptial migration can be even more complex. Since these situations are more likely to occur in large countries, the Commission invited large Member States, where reliable information exists, to provide different data for different parts of their territory (maximum three parts) during the current update (cf. section 5.1). Major differences between regions of the same latitude can reflect ecological differences. For example, although the southern parts of Spain (Andalucía) and Italy (Sicilia) are situated on the same latitude (37th parallel), this does not necessarily imply similar arrival dates of migrants because different populations might be involved.

The length of the migration period within a country not only depends on the north-south extension of the country concerned but also on the availability and the use of staging posts along their migration routes. A typical example concerns the Bar-tailed Godwit (*Limosa lapponica*), which migrates from the African winter quarters to Siberian breeding areas. After a continuous flight from the Banc d'Arguin in Western Africa, they stay several weeks in the Wadden Sea. The migration period length is also determined by the quantity and the geographical range of the birds involved: a small population can pass over a country in a few days while a large population of a species with an extensive breeding range can have a prolonged migratory season encompassing several months. Moreover, the migration period can also be long if a country is passed over by several populations of the same species with different migration schedules.

4 Criteria used to identify the start of the period of return to the rearing grounds and the start and end of the reproduction period

4.1. Start of the period of return to the rearing grounds

In general, the beginning of the prenuptial migration can be estimated by comparing different sources of data from different regions of the European Union, including analysis of ring recoveries, radio-tracking studies, citizen science data, as well as arrival dates in the breeding areas.

There is no agreed methodology applying to Member States for determining the start of the prenuptial migration period. The use of different approaches by Member States probably explains some of the discrepancies observed in the reported data. Further work is needed to come to an agreed method. New sources of information, such as the Migration Atlas of the Convention on Migratory Species, which applies to all EU countries, should assist in that regard (cf. section 8).

4.2. Reproduction period

a) Start of the reproduction period

In general, for migratory species, the start of the period of reproduction is identified as the "occupation of the breeding sites". However, the occupation of the breeding sites can be difficult to identify where there is mixing of locally resident and migratory birds. In these cases, the start of the period of reproduction is identified as the "construction of the nest". In situations where the most appropriate starting stage to be used is difficult to recognise in the field (e.g. courtship display), the start of the reproduction period is calculated based on the number of decades[21] counted from the start of egg laying (generally well known for most species).

In reporting the start of the reproduction period, the same categories as in the previous versions of the document have been used:

- Occupation of breeding sites,
- Construction of nest,
- Number of decades counted (back) from egg-laying,
- Other.

b) End of the reproduction period

In general, the end of the period of reproduction is the "full flight of young birds", i.e. fledging of all broods including second or third broods for some species (e.g. rails/*Rallidae*, pigeons/*Columbidae*, thrushes *Turdidae*). Full flight means that young birds are capable of sustained, continuous flight to a similar capacity as adult birds and corresponds to the "independence of young birds". Nonetheless, for certain species (e.g. crows/*Corvidae*), full flight occurs before "independence of young birds". Young birds are independent when the loss of parental care and/or feeding does not significantly lower their prospect of survival. In those situations where the "full flight/independence of young" is difficult to establish in the field, the end of the reproduction period is calculated based on the number of decades counted from the end of hatching.

In reporting the end of the reproduction period, again the same categories have been used as in the previous versions of the document:

[21] A decade is a ten-day period (i.e. 1-10, 11-20, 21 up to 31 in each month)

- Full flight of young birds,
- Independence of young birds,
- Number of decades counted from the end of hatching,
- Other.

4.2. Other general principles

Since it is not possible to indicate one precise date and in order to allow for normal between-year variations in the timing of migration and breeding events, the presentations summarise the data on prenuptial migration and reproduction in “decades” or ten-day periods (i.e. 1-10, 11-20, 21-30/31 in each month).

The following general principles apply, as in the previous version of this document:

- Regional differences may exist for prenuptial migration and reproduction periods within the territory of one Member State (especially in countries of a significant size). In these cases, the start of the period should relate to the earliest date in each of the Member States concerned. This is generally relating to the southernmost parts or lowest altitudes. Likewise, the end of the reproduction should refer to the latest date.
- To reflect regional differences, the Court considered that "*on condition that complete protection of the species is guaranteed, the fixing of closing dates which vary between the different parts of the territory of a Member State is compatible with the directive*" (cf. section 5.1).
- Where significant variation occurs from one year to another, the earliest date should be considered for the start of prenuptial migration and the latest date for the end of reproduction.
- Where different populations of the same species (i.e. different subspecies or different flyways) migrate through a country at different times, information relating to the earliest migrating population should be used. In some cases, where different populations are clearly distinguishable in the field, the start of migration can be fixed separately for each of the populations.
- Extreme, outlying and erratic data can be excluded due to their unpredictable nature and because they fall outside normal patterns of variation between and within years.

5 Process for updating the document

The most important aspects related to the process for updating the document are listed below. More detailed information can be found in Annex I of this document.

5.1. Gathering of data

- Member States were encouraged to involve both scientific experts and stakeholders to ensure that up-to-date and reliable scientific data was collected in a transparent manner.
- Member States were asked to refer to the data provided for the 2013-2018 report under the Article 12 of the Birds Directive, a.o. to draw up the list of species for which data should be submitted[22].
- Member States were asked to update data on the start and the end of both the prenuptial migration and the reproduction periods and to provide the relevant scientific references for all species listed in Annex II of the Birds Directive that occur on their territory, not only for those which are subject to hunting under their national legislation, to increase coherence across the flyway.

[22] The same coding of species has been used as in the Reference Portal for Natura 2000 (http://cdr.eionet.europa.eu/help/natura2000) .

- Member States were encouraged to pay particular attention to the start of the prenuptial migration period for migratory bird species, the start of reproduction for resident species, and the end of the reproduction period for both categories of species, considering their importance.
- If no new data was reported, the data and references used in the 2014 version of the Key Concept Document were retained.
- Member States were requested to first use published scientific references, with international ringing data and citizen science data to be used as additional sources of information.
- Large Member States were given the possibility to provide different decades for up to three parts of their territory, if relevant and sound scientific data on prenuptial migration and reproduction periods was available to support such a geographical approach. Only Finland and Spain availed of this possibility.

5.2. Assessment of data

Two successive checks of the data provided by Member States were undertaken. This entailed a completeness check and a coherence check. The aim was to ensure completeness of the submitted databases, minimise potential errors, and achieve better coherence between the reported periods of prenuptial migration and reproduction periods across EU Member States, particularly of neighbouring countries.

Completeness check

A completeness check of each individual national database was carried out. The aim was to verify the database structure, the completeness of mandatory fields, the presence of scientific references, the alignment between the list of species listed in Annex II of the Birds Directive reported by each Member State and the corresponding checklist from reporting under Article 12 of the Birds Directive.

On the basis of these checks, the Member States concerned were asked to remedy identified problems or to provide the necessary clarifications (errors, incomplete or unclear data).

Coherence check

Two consultations with Member States and stakeholders were carried out on the basis of a draft EU database of prenuptial and migration periods that had been compiled using the reported data from Member States. This was mainly aimed at ensuring the coherence of the reported periods between Member States at EU level.

The decades of the start of spring migration (or reproduction for sedentary species) and of the end of reproduction were compared between neighbouring Member States to detect and highlight any incoherencies. The Commission organised a technical meeting in May 2019 with experts from the Member States and key stakeholders to discuss issues that had emerged from the initial submission of Member States' data.

Finalisation of the document

In addition to the above-mentioned checks, the Commission raised specific issues with some Member States. These related to unclear data, missing data for certain species listed in Annex II of the Birds Directive, reported data which were not supported by any scientific reference in the Member States submissions, and changes to spring migration or reproduction periods that were based on older scientific references that were already available in 2014 when the last update occurred. In a few cases, the Commission did not accept the explanation provided by the Member State and took a more precautionary approach (earliest start of prenuptial migration or latest end of reproduction between the available (2014 and 2019) data).

Annex II, Table 4 provides an overview of all cases that were identified as requiring improved knowledge to underpin any decision on hunting or lacking enough data to underpin such a decision.

A final consultation of Member States and stakeholders was undertaken in July-September 2021 to correct any remaining factual errors

6 Presentation of data

The most important aspects related to the presentation of data are given below. More detailed information can be found in Annex I of this document.

6.1. Species accounts

The data for the 82 bird species and sub-species listed in Annex II of the Birds Directive are presented in individual species accounts arranged and numbered in a systematic order. The names of the species used in the species accounts are the same as those used in the European Union list of birds[23]. Some species have changed name since the adoption of the Birds Directive (cf. Table 1).

Scientific name as in the Birds Directive	English name	New scientific name
Anas querquedula	Garganey	*Spatula querquedula*
Anas clypeata	Northern Shoveler	*Spatula clypeata*
Anas strepera	Gadwall	*Mareca strepera*
Anas penelope	Eurasian Wigeon	*Mareca penelope*
Tetrao tetrix	Black Grouse	*Lyrurus tetrix*
Philomachus pugnax	Ruff	*Calidris pugnax*

Table 1. New scientific names for species listed in Annex II of the Birds Directive according to the most recent list of birds of the EU (August 2018).

All species accounts have the same structure (cf. Figure 2):

- A table providing the status of the species,
- A general description of the species,
- A first map with the start of the period of return to the rearing grounds, or the start of the reproduction period for resident species, or these two periods when both migratory and resident birds occur in the same Member State (e.g. *Turdus merula*),
- A second map with the end of the period of reproduction,
- A chart with the period of return to the rearing grounds and the period of reproduction,
- A section on current limitations of data.

A list of abbreviations is available in Annex I of this document.

[23] EU list of birds

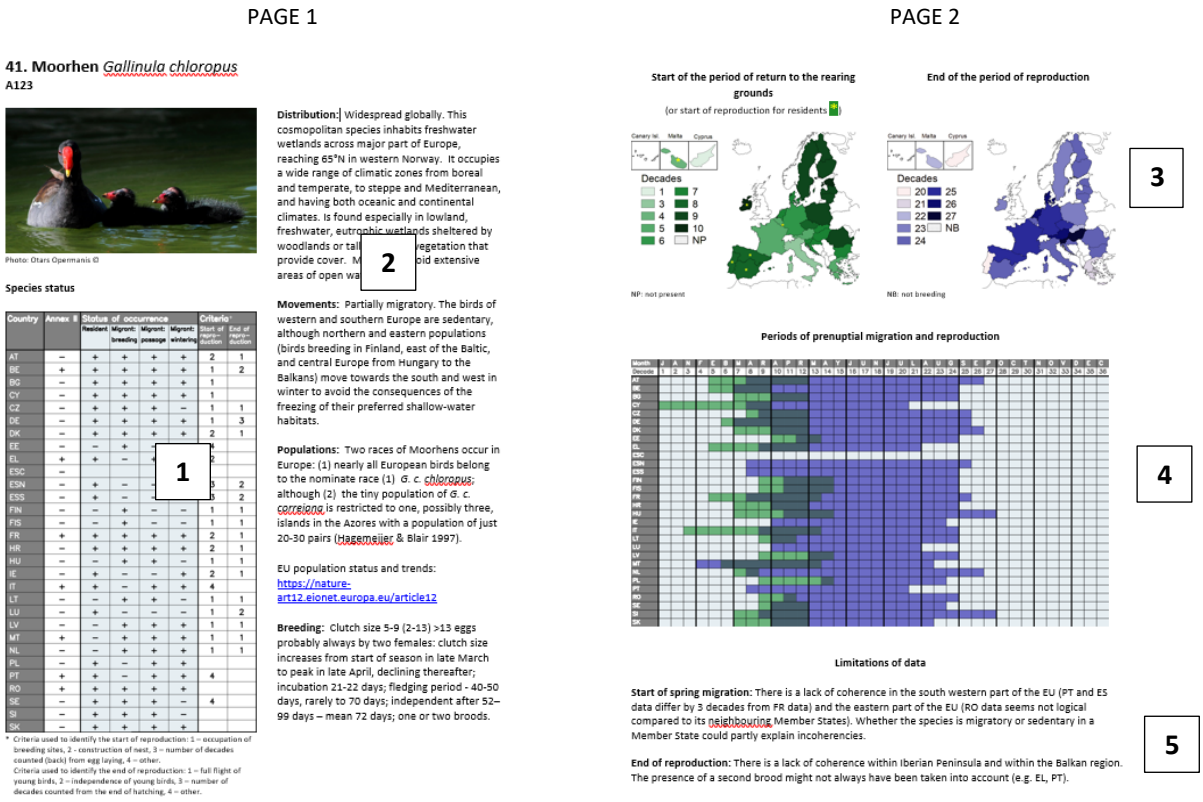

Figure 2. Example of a species account. The numbering of the different parts refers to the text below.

The content of each section of the species accounts is described hereunder.

1. *Species status table*

The table indicates:

- Whether the species is listed in part A or part B of Annex II of the Birds Directive,
- General information on the status of occurrence of the species in each Member State,
- The criteria used to determine the start and the end of the period of reproduction. The four possible criteria are listed at the bottom of the table.

The content of columns 3 to 8 is based on information provided by the Member States.

2. *Species description*

The text provides concise background information on the species' distribution, movements, populations, and breeding biology. The link to the Article 12 web portal or a species action plan, when there is one, provides access to more detailed information on the species.

3. *Maps*

The two maps respectively show:

- In green: the start of the period of return to the rearing grounds (or the start of reproduction for resident populations or species with both migratory and resident populations coexisting in the EU) across the European Union,

- In blue: the end of the period of reproduction (and the start of the period of reproduction for species that are resident in all Member States – e.g. *Perdix perdix*).

Other important features of the maps (figure 3) to note:

- The intensity of the colour reflects the timing of the prenuptial migration period (green) or the reproduction period (blue): The earlier the decade, the lighter the colour; the later the decade, the darker the colour.
- A yellow star indicates the start of the reproduction period for resident populations of a species in a Member State.
- When different decades were reported for different sub-species (e.g. for *Anser fabalis, Anser albifrons, Branta bernicla, Perdix perdix, Calidris canutus, Corvus corone*), the country is hatched and the decades for each sub-species appear between brackets.
- When a species has been declared as not present (NP) or not breeding (NB) by a Member State, the country area is dotted.
- When the species has been declared as present by a Member State but no data has been provided, the country area is crosshatched.

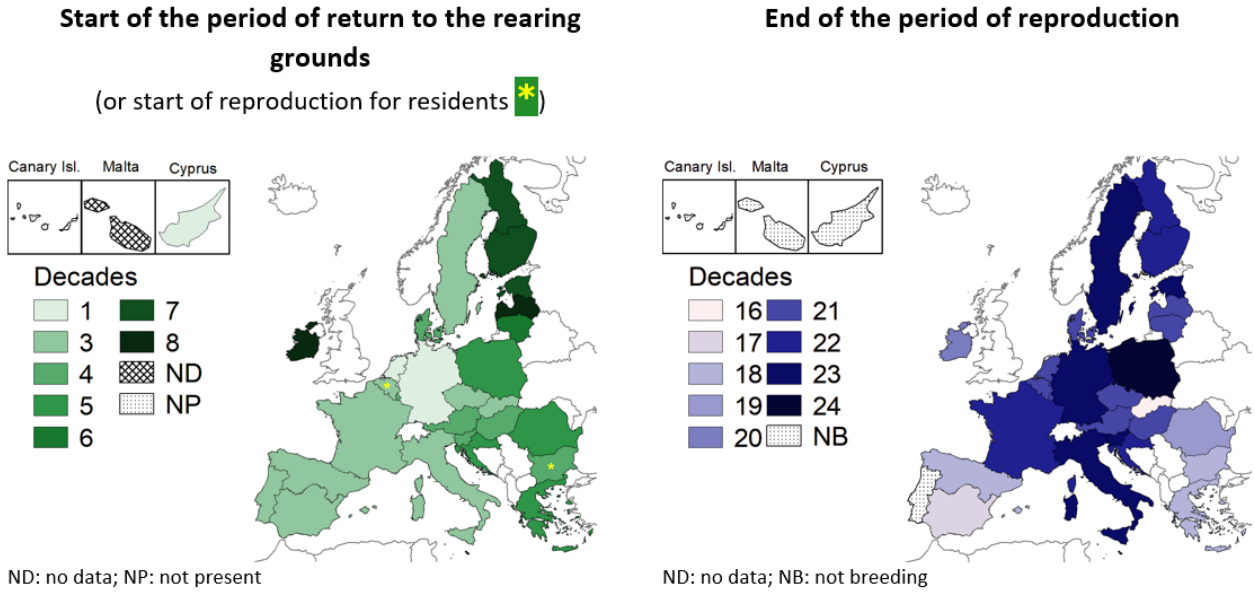

Figure 3. Examples of maps (Greylag Goose *Anser anser*): Left: "start of the period of return to the rearing ground" and Right "end of the period of reproduction".

4. Period charts

The charts provide prenuptial migration periods in green and reproduction periods in blue per country and per decade (from 1 for 1st January - 10th January, to 36 for 21th December – 31th December).

Important features of the charts (figure 4) are:

- The abbreviations used for the Member States, or their parts, are given in Annex I of this document.
- The striped green-blue areas indicate an overlap between the prenuptial migration period and the reproduction period.
- The charts do not provide information at sub-species level. When a Member State has reported different periods for different sub-species, the decades of the earliest migrating sub-species and the decades of the latest breeding sub-species are given in the chart. More information can be found on the maps and in the database.

- A row with decades only in grey indicates that no period has been reported for that species in that Member State. The reason can be that the species is absent or that it is present but that no data has been provided.
- A row with decades only in green indicates that the species does not reproduce in the Member State concerned or that no reproduction data has been provided.
- A row with decades only in blue indicates that the species does not migrate in the Member State concerned or that no migration data has been provided.

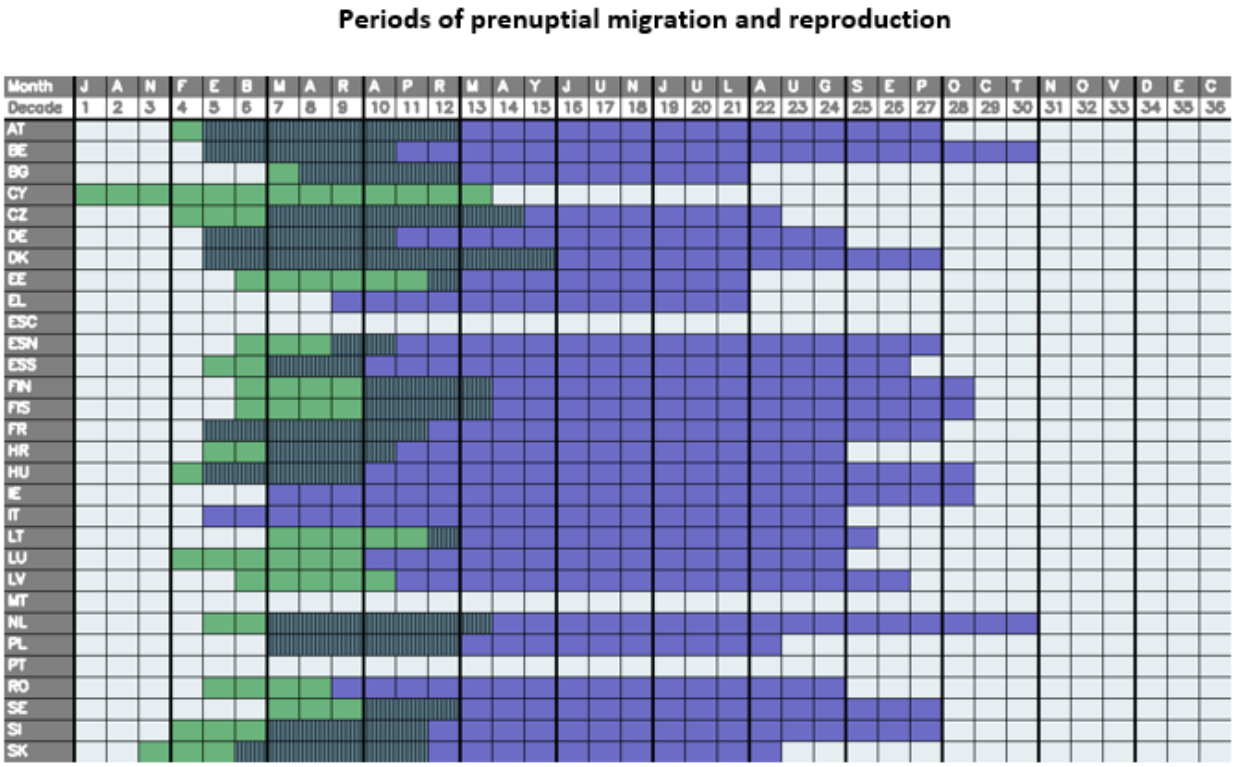

Figure 4. Example of a "Periods of prenuptial migration and reproduction" chart.

5. Limitations of data

This section highlights key issues that remain to be resolved (e.g. apparent inconsistencies between Member States or groups of Member States, lack of data, or possible errors) and provide species-specific recommendations with a view to future updates. Only Member States for which a species is listed in Annex II of the Birds Directive have been considered when examining possible inconsistencies.

Caveats to the species account relate to:

- Key outcomes of the discussions in the expert meeting organised by the European Commission in May 2019.
- Cases where there is a difference of more than two decades between neighbouring Member States. However, this does not necessarily mean that there is not an explanation for such a difference.

- Comments provided by Member States when submitting their data have been used as far as possible to explain some apparent inconsistencies. The original comments (May 2019) can be found in the Access database[24].
- species listed in Annex II of the Birds Directive for which no data was provided in 2019 nor in 2014. In such cases, the following comment has been added: "*There is not enough data to underpin a decision on hunting in (Member State) because no data has been provided in 2019 and no data was available in the 2014 version of the document*".

The limitations of data are also presented in greater detail in Annex II of this document.

6.2. References used for the reported periods

Member States were asked to provide at least one scientific reference for each reported period. When no new data was submitted, references that had already been provided for the 2014 update were imported into the Access database.

The references used by Member States to underpin the reported prenuptial migration periods and reproduction periods are given in Volume 2 of the present document. References are arranged by species in systematic order and then by Member State in alphabetical order.

References are also available in the Access database accessible on the Commission's website.

6.3.Database

The Microsoft Access database, available on the DG Environment website, contains all data used to produce the present document. Species have been coded according to the system used for reporting under Article 12 of the Birds Directive. The database will be a key tool for future updates. A User's Manual[25] explains how to use the database.

7 Species accounts

The 82 species accounts can be consulted on the website of DG Environment[26].

8 Recommendations for further improvements

Where the quality of data is poor, Member States should apply a precautionary approach when defining the start of the prenuptial migration period or the end of the reproduction period and consequently, in setting the opening and closing dates for hunting. In the absence of data, it is not possible to comply with the requirements of Article 7 of the Birds Directive and in such circumstances, no hunting of these species should be considered, until the necessary data is collected.

[24] https://circabc.europa.eu/ui/group/fcb355ee-7434-4448-a53d-5dc5d1dac678/library/1ddac276-c310-4b43-a40b-6365d56563b5?p=1&n=10&sort=modified_DESC

[25] https://circabc.europa.eu/ui/group/fcb355ee-7434-4448-a53d-5dc5d1dac678/library/e7cd26b7-f42e-476a-bf2b-9347da64a6b3?p=1&n=10&sort=modified_DESC.

[26] https://ec.europa.eu/environment/nature/conservation/wildbirds/action_plans/guidance_en.htm

Based on the experience of the current updating exercise some key recommendations on areas of improvement need to be highlighted for future updates:

- The knowledge on the phenology of birds (start of the prenuptial migration period and end of the reproduction period) is still too weak in some Member States for certain species, which will require a significant research effort to resolve.
- Interpretation of data to determine the start or the end of the critical periods in a harmonised way across the EU and in accordance with the jurisprudence of the Court of Justice of the EU remains a challenge. There is a need to work on guidelines to harmonise methodologies and improve the coherence across the EU.
- There is a particular need to improve knowledge and develop a common understanding to better enable distinguishing between movements within wintering quarters and prenuptial migration.
- There is also a need to improve knowledge and develop a common understanding to enable the identification of the start of the prenuptial migration period when a resident population and a migratory population co-exist in the same region.
- Larger Member States are encouraged to carry out the necessary research that would enable them to provide different data at sub-national level.
- The relevance and potential application of new available sources of information, including ringing recovery data (e.g. CMS Bird Atlas), and citizen science data (eg Eurobird Portal[27]) needs to be fully exploited.

9 References

The following is a list of references used for the introduction and background information on each species (p. 1 of the species accounts). The references used for the reported periods by Member States are available in Volume 2 of this document (printable format), as well as in an Excel file, and in an Access database, all of them accessible on the European Commission's website.

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Annex I - Detailed procedural and technical information

1. Process for updating the document

a) Gathering of data

The following information complements section 5.1:

- BirdLife International and the Federation of Associations for Hunting and Conservation of the EU (FACE) were invited to provide their data to the authorities in charge of preparing the national dataset for the European Commission. It was for the authorities in the concerned Member States to decide on how to use that information.
- In 2018, the European Commission services provided guidelines[28] on how to best use data that is available on regional, national, and European bird portals, also in combination with other sources of information (e.g. ringing data).
- The territorial divisions of Finland (two parts) and Spain (three parts) are presented in Figure 5.
- Member States´ databases as well as comments and studies from Member States and stakeholders have been made available on CircaBC[29] throughout the process and will remain available[30].
- Member States submitted their databases by emails to the European Commission between 24 October 2018 and 11 March 2019, with the exception of Austria, which submitted its database on 13 May 2019. Five Member States did not submit any new databases (Table 2). For those Member States as well as for those that provided data for few species only, data from the 2014 version of the Key Concepts Document were converted into the new data format and incorporated into the EU MS Access database.
- To facilitate the process, a specific tool was provided to Member States to gather the data in a uniform way. All data, including references, were put in a MS Access database.

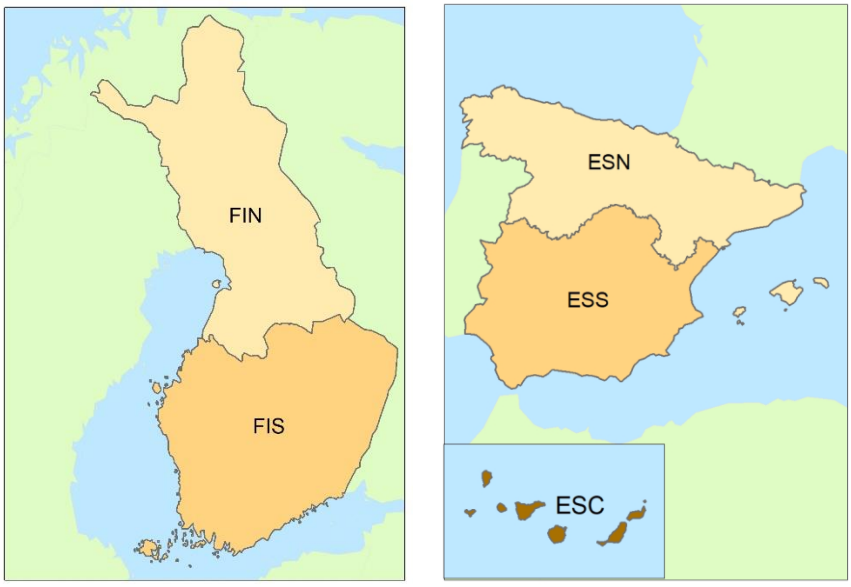

Figure 5. Territorial division of Finland and Spain

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29 CircaBC is a collaborative platform, which offers an easy distribution and management of documents.

30 https://circabc.europa.eu/ui/group/fcb355ee-7434-4448-a53d-5dc5d1dac678/library/f2e9245c-7a03-4213-a95a-dca2a2afbfcb?p=1

MS	Databases submitted*	Reviewed database further to the completeness check	Proposed revisions of reported periods further to the coherence check
AT	Full	No	No
BE	Full	Yes	Yes
BG	Full	Yes	Yes
CY	Full	Yes	No
CZ	Full	Yes	Yes
DE	Full	No	No
DK	Full	Yes	Yes
EE	No	No	No
EL	Partial	Yes	Yes
ES	Full	Yes	Yes
FI	Full	Yes	Yes
FR	Full	Yes	Yes
HR	Full	No	Yes
HU	Full	Yes	Yes
IE	Full	No	No
IT	Partial	No	Yes
LT	Full	Yes	Yes
LU	Full	No	Yes
LV	Full	Yes	Yes
MT	Full	Yes	Yes
NL	Full	Yes	Yes
PL	Full	Yes	Yes
PT	No	No	No
RO	No	No	No
SE	No	No	No
SI	No	No	No
SK	Full	Yes	No

Table 2. Summary on the database submissions and subsequent actions by Member States
* Meaning of the categories. "Full": the Member State has provided data for all species listed in Annex II of the Birds Directive present in its territory. "Partial": the Member State has provided data for a selection of species (the data of the 2014 version of the Key Concepts Document has been used for the remaining species). "No": the Member State has not provided any data (the data of the 2014 version of the Key Concepts Document has been used for all species).

b) Assessment of data

The following information complements section 5.2:

- Further to the completeness check, sixteen Member States submitted an updated database (cf. Table 2).
- For the coherence check, Members States were consulted twice (7 April to 15 May 2019 and 21 May to 31 July 2019).
- The assessment of the coherence of data for the start of prenuptial migration was based on the assumption that migration is generally in a north/north-east direction.
- Differences of two decades or more for the start of the prenuptial migration period or the end of the reproduction period between neighbouring countries were highlighted (cf. figure 6). Member States

were then asked to check their data having regard to the data of their neighbours. Further to that analysis and bilateral contacts between Member States, updated versions of national databases were submitted. A total of 354 changes in decades were made further to that check. Not all Member States responded and some inconsistencies remain unresolved. More information on the coherence check can be found on CircaBC[31].

- During the consultation period for the coherence check, an ad-hoc expert meeting with representatives of Member States and stakeholders took place on 21 May 2019. It examined ways to address incoherencies across the flyway. The minutes of the meeting are available on CircaBC[32].
- After the completeness and coherence checks, the Commission raised specific issues with some Member States (May 2020, July 2020, February 2021, March 2021). Changes to the database were made based on the evidence provided by the Member States. The outcome of the exchanges with the Member States is summarized in Annex II of this document.
- The Expert Group on the Nature Directives (NADEG) was regularly informed about progress, in particular as regards the completeness and coherence checks.

Start of prenuptial migration

Country-pair	Species name	Country1	Country2	Decade1	Decade2	Difference
AT_CZ	Anas crecca	AT	CZ	4	6	2
AT_DE	Anas crecca	AT	DE	4	6	2
AT_HU	Anas crecca	AT	HU	4	4	0
AT_SK	Anas crecca	AT	SK	4	4	0
BE_NL	Anas crecca	BE	NL	6	6	0
BG_RO	Anas crecca	BG	RO	4	5	1
CY_BG	Anas crecca	CY	BG	1	4	3
CY_GR	Anas crecca	CY	GR	1	4	3
CZ_PL	Anas crecca	CZ	PL	6	7	1
CZ_SK	Anas crecca	CZ	SK	6	4	-2
DE_CZ	Anas crecca	DE	CZ	6	6	0
DE_DK	Anas crecca	DE	DK	6	6	0
DE_LU	Anas crecca	DE	LU	6	6	0
DE_PL	Anas crecca	DE	PL	6	7	1
DE_SE	Anas crecca	DE	SE	6	8	2
DK_SE	Anas crecca	DK	SE	6	8	2
EE_FIS	Anas crecca	EE	FIS	9	8	-1
ESN_FR	Anas crecca	ESN	FR	4	4	0
ESS_ESN	Anas crecca	ESS	ESN	3	4	1
FIS_FIN	Anas crecca	FIS	FIN	8	8	0
FR_BE	Anas crecca	FR	BE	4	6	2
FR_DE	Anas crecca	FR	DE	4	6	2

End of reproduction

Country-pair	Species name	Country1	Country2	Decade1	Decade2	Difference
AT_IT	Anas crecca	AT	IT	23	25	-2
AT_SI	Anas crecca	AT	SI	23	23	0
BE_FR	Anas crecca	BE	FR	23	24	-1
CZ_AT	Anas crecca	CZ	AT	25	23	2
DE_AT	Anas crecca	DE	AT	24	23	1
DE_CZ	Anas crecca	DE	CZ	24	25	-1
DE_FR	Anas crecca	DE	FR	24	24	0
DE_NL	Anas crecca	DE	NL	24	22	2
DK_DE	Anas crecca	DK	DE	24	24	0
DK_NL	Anas crecca	DK	NL	24	22	2
EE_LV	Anas crecca	EE	LV	23	23	0
ESN_ESS	Anas crecca	ESN	ESS	24	23	1
FIN_FIS	Anas crecca	FIN	FIS	24	24	0
FIN_SE	Anas crecca	FIN	SE	24	24	0
FIS_EE	Anas crecca	FIS	EE	24	23	1
FR_ESN	Anas crecca	FR	ESN	24	24	0
HU_AT	Anas crecca	HU	AT	24	23	1
HU_SI	Anas crecca	HU	SI	24	23	1
IT_FR	Anas crecca	IT	FR	25	24	1
LT_PL	Anas crecca	LT	PL	20	22	-2
LV_LT	Anas crecca	LV	LT	23	20	3
NL_BE	Anas crecca	NL	BE	22	23	-1

Figure 6. Example of table highlighting for the Common Teal *Anas crecca* differences between 1) the start of prenuptial migration between neighbouring countries. The column "Difference" indicates the difference in decades between two neighbouring Member States; 2) the end of reproduction between neighbouring countries. The column "Difference" indicates the difference in decades between two neighbouring Member States.

2. Presentation of data

The following information complements the content of section 6:

- The names of the species in the EU MS Access database are those of the Birds Directive and not those of the EU list of birds (see table 1 for the correspondence for the six species whose name has changed).

[31] https://circabc.europa.eu/w/browse/9ba39cc4-e585-4ed8-b76f-c22a23c204c7

[32] https://circabc.europa.eu/ui/group/fcb355ee-7434-4448-a53d-5dc5d1dac678/library/fad6e374-83b0-4312-9330-0a89c7934ce5?p=1&n=10&sort=modified_DESC

- The reference below the species name is the species code (cf. the code list for birds species covered by the Birds Directive[33]). The same code can be found in the MS Access database.
- Compared to the 2014 version, there is one new species: the Yellow-legged Gull (*Larus michahellis)*, which has been taxonomically separated from the Caspian Gull (*Larus cachinnans*), which is listed in Annex II of the Birds Directive.
- The sources of information used to draft the background information section on each species (p. 1 of each species account) are the following (see section 9 for the complete references):
    - Distribution and movements: Information on global distribution and movements is taken from relevant species accounts in the Birds of the Western Palearctic (Cramp 1985, 1988; Cramp & Perrins 1994; Cramp & Simmons 1977, 1980, 1983). European breeding distributions are informed by the 1997 EBCC Atlas of European breeding birds (Hagemeijer & Blair 1997) with more recent information, for example from national Article 12 reports, as appropriate and recognizing distributional changes since the 1990s. Information on distribution and migratory status of waterbirds are taken from Wetlands International's *Anatidae* Atlas (Scott & Rose 1996), and the Wader Atlas (Delany et al. 2009). CAFF's recent global review of goose populations by Fox & Leafloor (2018a, b) provided useful information. Information on cold weather movements of waterfowl in Western Europe is largely drawn from Ridgill & Fox (1990). Reviews of European movements of birds by Balmer et al. 2002 provided much useful information.
    - Populations: Population definitions for waterbirds essentially follow the wildfowl and wader atlases (Scott & Rose 1996; Delany et al. 2009) unless superseded by (for relevant migratory waterbird species) changes formally adopted by Parties to the Agreement on the Conservation of migratory African-Eurasian Waterbirds (most recently in AEWA 2018). For non-waterbird species, information on distributions of sub-specifies follows Birds of the Western Palearctic (above) unless otherwise stated.
    - Breeding: Information follows Birds of the Western Palearctic (above).

3. Abbreviations

EU Member States	
AT	Austria
BE	Belgium
BG	Bulgaria
CY	Cyprus
CZ	Czechia
DE	Germany
DK	Denmark
EE	Estonia
EL	Greece
ES	Spain
FI	Finland
FR	France
HR	Croatia
HU	Hungary
IE	Ireland
IT	Italy
LT	Lithuania

[33] http://cdr.eionet.europa.eu/help/natura2000

LU	Luxemburg
LV	Latvia
MT	Malta
NL	The Netherlands
PL	Poland
PT	Portugal
RO	Romania
SE	Sweden
SI	Slovenia
SK	Slovakia
Other abbreviations	
EU	European Union
KCD	Key Concepts Document
MS	Member States
NB	Not breeding
ND	No data
NP	Not present
ESC	Spain – Canary Islands
ESN	Spain North
ESS	Spain South
FIN	Finland North
FIS	Finland South
UK	United Kingdom

Table 3: List of abbreviations

Annex II – cases with deficient knowledge or data

The table 4 below provides an overview of all cases to which one of the two following comments applies:

- Comment A: "*There is a need to improve knowledge to underpin any decision on hunting in the concerned Member State*".
- Comment B: "*There is not enough data to underpin a decision on hunting in the concerned Member State*".

The following cases (from 1 to 4) have been identified:

1. Missing data in 2019 (Annex II species only):
    a. and there were reference(s) in 2014, the 2014 data and reference(s) have been retained. Comment A applies.
    b. and missing reference(s) in 2014, the 2014 data has been retained. Comment A applies.
    c. missing data in 2014 and the species is considered as "rare" by the concerned Member State. Comment A applies.
    d. and missing data in 2014. Comment B applies.
2. Missing references in 2019 (Annex II species only):
    a. and the start of the prenuptial migration period has been postponed / the end of the reproduction period has been anticipated compared to the 2014 data. In this case the 2014 data has been retained. Comment A applies.
    b. and the start of the prenuptial migration period has been anticipated or kept / the end of the reproduction period has been postponed or kept compared to the 2014 data. In this case the 2019 data has been retained. Comment A applies.
3. Change of the prenuptial migration or reproduction period compared to 2014 version of the document only based on references prior or equal to 2012 (Annex II species only):
    a. and the start of the prenuptial migration period has been postponed / the end of the reproduction period has been anticipated:
        i. and there were reference(s) in 2014, the 2014 data and reference(s) have been retained. Comment A applies.
        ii. and missing reference(s) in 2014, the 2019 data has been retained. Comment A applies.
    b. and the start of the prenuptial migration period has been anticipated or kept / the end of the reproduction period has been postponed or kept as compared to the 2014 data. In this case the 2019 data has been retained. Comment A applies.
4. Specific cases:
    a. Cases not covered under the points above for which there is a need to improve knowledge. 2019 data retained. Comment A applies.
    b. Cases not covered under the points above for which there is a need to improve knowledge. 2014 data retained. Comment A applies.

Table 4. List of cases for which comment A (all cases except 1d) and comment B (1d) apply.

		Type of case										
Species	Period	1a	1b	1c	1d	2a	2b	3ai	3aii	3b	4a	4b
1 - Cygnus olor	*Migration*		EE									
	Reproduction		EE, SI									
2 - Anser fabalis	*Migration*		EE, SI	IE, MT, PT								
	Reproduction											
3- Anser brachyrhynchus	*Migration*	IE	EE, SE									
	Reproduction											
4 - Anser albifrons	*Migration*		EE, IT, SI, SE									
	Reproduction											
5 - Anser anser	*Migration*		EE, PT, SI	MT								
	Reproduction		EE, IT, SI				BE	LT, PL			LV	
Branta canadensis	*Migration*			CZ				PL				
	Reproduction			PL			IE					
Branta bernicla	*Migration*		EE									
	Reproduction											
Anas penelope	*Migration*		LU, EE, SI					PL	MT			
	Reproduction	DE										
Anas (Mareca) strepera	*Migration*		EE, SI	MT					PL			
	Reproduction		EE, SI				BE					
Anas crecca	*Migration*		SI							PL		
	Reproduction		EE, SI				BE					
Anas platyrhynchos	*Migration*		EE, SI					PL, SK				
	Reproduction		EE, IT, SI				BE					

Anas acuta	*Migration*		EE, SI				DK		MT	PL		
	Reproduction	DE	EE		RO		BE					
Anas querquedula	*Migration*		EE,PT, SI				DK					
	Reproduction		EE, SI	PT			BE			LT		
Anas clypeata	*Migration*		EE, SI				DK					
	Reproduction		EE, SI	PT	RO		BE					
Netta rufina	*Migration*		IT, SI									
	Reproduction		IT, PT, SI									
Aythya ferina	*Migration*		EE, IT, SI				DK					
	Reproduction		EE, IT, SI	PT			BE					
Aythya fuligula	*Migration*		EE, IT				BE, DK			PL		
	Reproduction		EE, SI					LT			LV	
Aythya marila	*Migration*		EE		EL							
	Reproduction		EE									
Somateria molissima	*Migration*		EE, IT, SI		IE							
	Reproduction		EE									
Clangula hyemalis	*Migration*		EE									
	Reproduction											
Melanitta nigra	*Migration*		IT, PT									
	Reproduction											
Melanitta fusca	*Migration*		EE									
	Reproduction		EE									
Bucephala clangula	*Migration*		EE, IT, SI		EL	DK						
	Reproduction		EE		RO							
Mergus serrator	*Migration*		EE, SI		MT							
	Reproduction											
Mergus merganser	*Migration*		EE, SI	LU	IE		DK					
	Reproduction		SI									
Bonasa bonasia	*Migration*											
	Reproduction		EE, SI									
Lagopus lagopus scoticus et hibernicus	*Migration*											

	Reproduction											
Lagopus lagopus lagopus	*Migration*											
	Reproduction		EE									
Lagopus mutus	*Migration*											
	Reproduction		SI	BG								
Tetrao tetrix	*Migration*											
	Reproduction		EE, SI									
Tetrao urogallus	*Migration*											
	Reproduction		EE, SI									
Francolinus francolinus	*Migration*											
	Reproduction											
Alectoris chukar	*Migration*											
	Reproduction											
Alectoris graeca	*Migration*											
	Reproduction		SI	DE								
Alectoris rufa	*Migration*											
	Reproduction				IE							
Alectoris barbara	*Migration*											
	Reproduction											
Perdix perdix	*Migration*											
	Reproduction		EE, SI	PT				BG				CZ
Coturnix coturnix	*Migration*		EE, PT, SI									
	Reproduction		EE, SI, SE					BG				
Phasianus colchicus	*Migration*											
	Reproduction		SI					BG	PL		LV	
Meleagris gallopavo	*Migration*											
	Reproduction			DE								
Rallus aquaticus	*Migration*		EE, IT, SI									
	Reproduction		EE, IT, SI									
Gallinula chloropus	*Migration*		EE, SI									
	Reproduction		EE, SI									
Fulica atra	*Migration*	NL	EE, SI				DK					

	Reproduction		EE, PT, SI					LT				
Haematopus ostralegus	*Migration*		EE									
	Reproduction		EE									
Pluvialis apricaria	*Migration*		EE, IT, SI									
	Reproduction		EE				DK					
Pluvialis squatarola	*Migration*		EE, SI									
	Reproduction											
Vanellus vanellus	*Migration*		EE, IT, PT, SI				DK					
	Reproduction		EE, IT, SI				BE			DK		
Calidris canutus	*Migration*		EE, PT, SI									
	Reproduction											
Calidris pugnax	*Migration*		EE, PT, SI									
	Reproduction		EE									
Lymnocryptes minimus	*Migration*		EE	PT				PL				
	Reproduction	PL										
Gallinago gallinago	*Migration*		EE, PT, SI				IE					
	Reproduction		EE, SI				BE			PL	LV	
Scolopax rusticola	*Migration*		EE, SI				IE			PL		
	Reproduction		EE, SI		PT		BE				LV	
Limosa limosa	*Migration*		EE, IT, PT, SI				DK					
	Reproduction		EE, IT, SI									
Limosa lapponica	*Migration*		EE, IT									
	Reproduction											

Numenius phaeopus	*Migration*		EE, IT									
	Reproduction		EE									
Numenius arquata	*Migration*		EE, IT, PT, SI				DK, IE					
	Reproduction		EE, SI									
Tringa erythropus	*Migration*		IT, SI									
	Reproduction											
Tringa totanus	*Migration*		EE, PT, SI			DK						
	Reproduction		EE, IT, PT, SI									
Tringa nebularia	*Migration*		EE, IT, SI									
	Reproduction		EE									
Larus ridibundus	*Migration*		EE, IT, PT, SI									
	Reproduction		EE, IT, SI									
Larus canus	*Migration*		EE, IT, SI				FIS					
	Reproduction		EE				FIS					
Larus fuscus	*Migration*		EE, PT									
	Reproduction		EE						DK			
Larus argentatus	*Migration*		EE			FIN & FIS					LV	
	Reproduction		EE				FIN & FIS				LV	
Larus cachinnans	*Migration*											
	Reproduction		PT, SI									
Larus michaellis	*Migration*											
	Reproduction		IT									
Larus marinus	*Migration*		EE			FIN & FIS						
	Reproduction		EE									

Columba livia	*Migration*											
	Reproduction		EE		PT					PL	LV	
Columba oenas	*Migration*		EE, SI, SE		PT, EL							
	Reproduction		EE, SI		PT							
Columba palumbus	*Migration*	BG	EE, IT, PT, SI				IE					
	Reproduction		EE, IT, PT, SI				BE	BG				
Streptopelia decaocto	*Migration*		SE									
	Reproduction		EE, SI			DK		BG, CZ				
Streptopelia turtur	*Migration*		EE, IT, PT, SI									
	Reproduction		EE, IT, SI					BG				
Alauda arvensis	*Migration*		EE, PT, SI, SE									
	Reproduction		EE, PT, SI, SE									
Turdus merula	*Migration*		EE, SI, SE									
	Reproduction		EE, SI, SE									
Turdus pilaris	*Migration*		EE, SI	PT			FIS					
	Reproduction		EE, SI									
Turdus philomelos	*Migration*		EE, PT, SI, SE						MT			
	Reproduction		EE, SI, SE									
Turdus iliacus	*Migration*		EE, PT,									

			SI, SE									
	Reproduction		EE									
Turdus viscivorus	*Migration*		EE, SI, SE	MT								
	Reproduction		EE, SI, SE									
Garrulus glandarius	*Migration*		EE									
	Reproduction		EE, SI, SE		PT		BE					
Pica pica	*Migration*											
	Reproduction		EE, IT, SI					BG			LV	
Corvus monedula	*Migration*		EE		EL		FIN, FIS					
	Reproduction		EE, IT, SI							BG		
Corvus frugilegus	*Migration*		EE, SI		EL							
	Reproduction		EE									
Corvus corone	*Migration*		EE	FR		DK	FIN, FIS					
	Reproduction		EE, IT, PT, SI							-	LV	CZ
Sturnus vulgaris	*Migration*		EE, IT, SI		PT		CY					
	Reproduction		EE, SI				CY			BG		
