Harvest data reported under the Birds Directive: A first overview

FACE, 2022

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1) For the period 2013-2018, 25 out of 28 EU Member States reported hunting bag data to the European Commission.

2) Most Member States' reports were based on complete surveys or statistically robust estimates.

3) Although this is a very valuable dataset, to date, no detailed analysis has been undertaken.

4) Improvements are required to fill data gaps such as reports of species groups (e.g., ducks) rather than at species level or absent data for some species and the two Member States that did not report.

5) Greater feedback to Member States is needed to address these gaps.

6) So far, the data have not been widely used, except for some single species action plans (e.g., Turtle dove or geese), but these processes require data submission on an annual basis, rather than a 6-year cycle.

7) FACE urges its Members and Member States to take these insights into account to improve the reporting of harvest data for the next reporting period 2019-2024.

1. INTRODUCTION

The collection of harvest data plays a significant role in understanding wild game populations and providing a basis for conservation and management decisions. Whether it is used as an index for ungulates population densities (Imperio *et al.*, 2010, Merli & Meriggi, 2006, Uena *et al.*, 2014) or to assess the impact and sustainability of hunting on game populations, e.g., in Adaptive Harvest Management (AHM) processes (Madsen *et al.* 2011, Williams *et al.* 2009). Hunting bag statistics collection has a long history in Europe (Madsen *et al.*, 2011), however there is a great variability between countries regarding systems and frequency of data collection (Aubry *et al.*, 2020a, Åhl *et al*, 2021).

Some Member States compile such data annually while others conduct punctual surveys, and report of harvested game by the hunter is either mandatory or voluntary depending on the country, or both (see Åhl *et al*, 2021, where an overview of the reporting systems of 22 countries is provided). For example, reporting harvested game is mandatory in Denmark and their statistics date back to 1941, in Finland and Greece game statistics are based on a yearly survey sample among hunters and statistics are available since the mid-1990s, in France surveys are made to estimate harvests every decade in France since 1983.

In order to centralise harvest data at the EU level, the last reporting exercise under the EU Birds Directive (Article 12) required Member States, for the first time, to report on national harvest for the period 2013-2018.

However, criticisms have been raised towards this data set, including in the State of Nature report 2020 (EEA, 2020), in which it is stated that:

"*Hunting bag information - although mandatory in Article 12 reporting for those Annex II birds that are hunted nationally - still shows significant gaps: in over 78% of reports no information on hunting bags was provided.*"

This statement was unfortunately cut short in the editing, as the original sentence was stating that in over 78% of reports no information on hunting bags was provided _for at least one year_ (of the 6 years cycle). So, one missing year was considered as no data being reported.

To this date, no comprehensive analysis has been produced and this large dataset has remained largely unused, therefore providing no feedback for Member States on their reporting exercise. This is not the case for other quantitative data reported under Article 12.

It is of FACE's view that this dataset represents a valuable tool in the field of the conservation of huntable birds. Therefore, a short summary analysis of this first round of common reporting on bag data from the Member States is a necessity to provide more clarity on the quality and gaps of the Article 12 bag data set, including on the statements cited above.

2. METHODOLOGY

FACE assessed the harvest data reported by Member States in the framework of the Birds Directive (Art.12) for the reporting cycle 2013-2018. For each year of the 6-year reporting cycle, Member States were required to report their national harvests for each of the species that had an open hunting season. This resulted in a large data set, gathering national reports of bird harvest through hunting, while excluding other sources of human mortality, including under derogations. The Article 12 - 2020 dataset is publicly available on the European Environment Agency (EEA) and was the basis of the European Commission's report, the State of Nature in the EU 2020.

First, we looked at the relative share of known and unknown harvests, as this information was requested for each year. Care was given to identify cases where the harvest was reported as known but for which no data was reported. These were regarded as unknown in the following analysis.

In addition to the harvest values, an indication of the method through which the values were collected is provided by Member States. This indication ranges from "complete survey", being the best-case scenario to "absent data" being the worst-case scenario. We therefore looked at the relative share of the different methods used to compile the data which can be regarded as the quality of the data reported.

Then, we looked at the quality of the data reported at Member State level.

It is important to note that the dataset contains many blanks that correspond to species that are not hunted at national levels, which should therefore be excluded from the analysis of what was reported.

The dataset includes all 82 species listed in the Annex II of the Birds Directive and when sub-species are included this relates to 97 taxa).

3. RESULTS

WHAT ARE THE DATA GAPS?

The most notable missing data are the absence of harvest reported by the UK, the Netherlands, and Ireland. However, these Member States have reporting schemes in place, but they did not report the information.

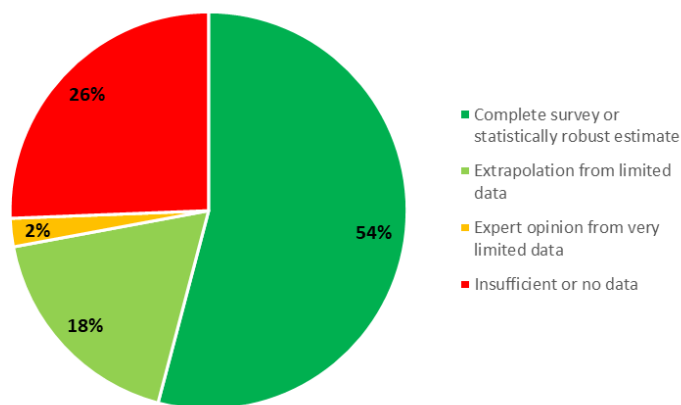In addition to these, cases of absent data at species or year level for some Member States occur.

When analysing how many harvest reports are missing, it appears that missing data accounts for 29% of the dataset.

Therefore, **71% of yearly harvests were reported**.

- Known harvest
- Unknown harvest
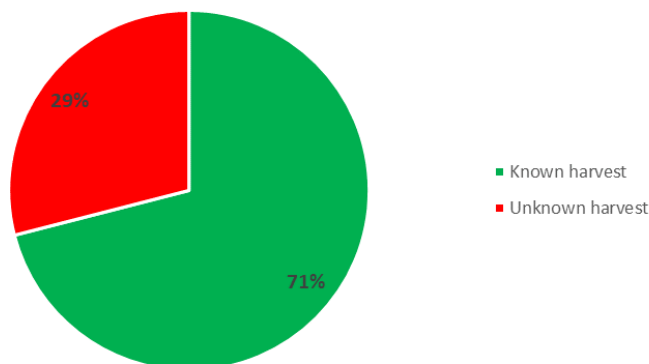
WHAT IS THE QUALITY OF THE DATA?

The analysis of the reported methods through which hunting bags were computed for each yearly harvest value reported shows that **more than half of the reports are based on complete surveys or statistically robust estimate**. On the other hand, approximately a quarter of bag values were reported as absent data and a fifth as partial or expert estimates.


- Complete survey or statistically robust estimate
- Extrapolation from limited data
- Expert opinion from very limited data
- Insufficient or no data

A general overview of what was actually reported per country is provided below.

The Member States were distributed into three groups according to the following quality parameters:

- Good, when countries reported mostly complete surveys.
- Medium, when countries mostly reported partial data, when problematic grouping of harvests occurs (e.g., "ducks"), or in the presence of too much missing data.
- No data, for the countries that did not report their harvests.

This exercise results in the following map of EU Member States, according to their bag data reporting quality.
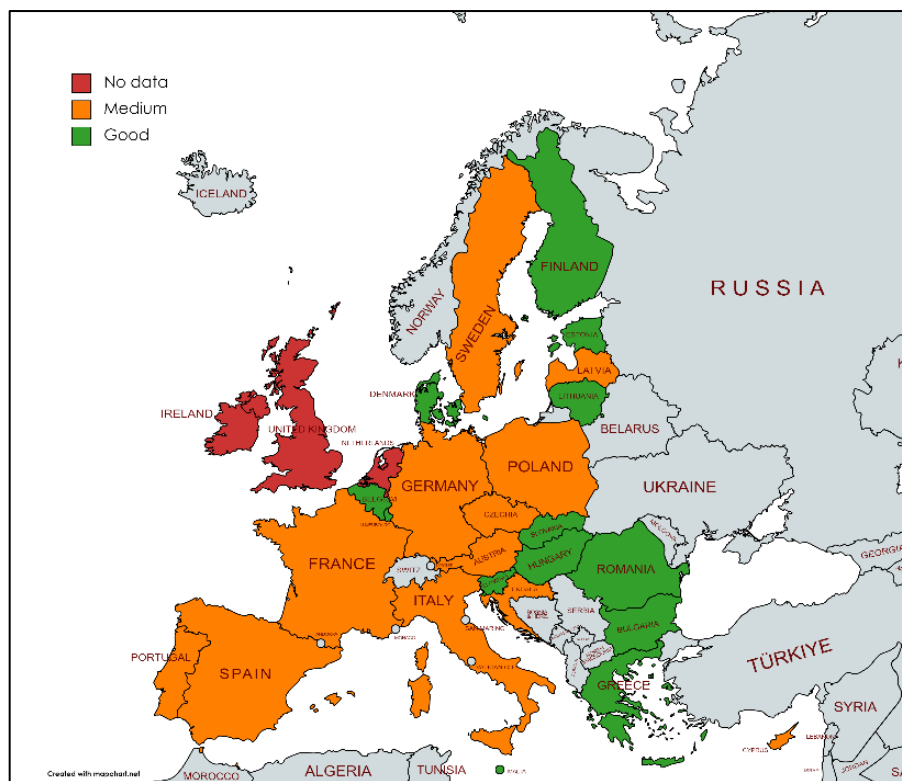
However, the aim of this analysis was not to judge the quality of the harvest estimates *per se*, but to show an overview of areas of improvement by countries.

An overview of what was reported is provided in the following tables which gives a rapid description of the data reported by each country.

Good	
Belgium	In **Belgium**, the values provided are based on complete surveys. However, for some species, data was available only for 1 year from the Walloon region, which represents half of the country. For these species, this year should therefore be used as the estimate of bags for Belgium.
Bulgaria	In **Bulgaria**, reporting harvest data is mandatory. The data provided was mostly based on complete surveys (19 species). Absent data was reported for 3 species and expert opinion was given for 1 species but with an estimate of 0. One of these species is the Turtle Dove, for which data was submitted to the EC in the framework of the Adaptive Harvest Management.
Denmark	Harvest reporting in **Denmark** is a very good example. Hunters are requested to report the harvested game before being able to renew their license since 1947.
Estonia	Good bag data is reported by **Estonia** for all species and is mandatory.
Finland	**Finland** mostly reported complete surveys. However, the harvest is grouped for 2 species of gulls.
Greece	**Greece** reported good harvest data via its Artemis project which records and monitors game species populations in Greece through harvest indices since 1995.
Hungary	**Hungary** reported values based on complete surveys and reporting is mandatory. Some bags are reported for the breeding season and 3 species are reported twice for different seasons (with the same bag value).
Lithuania	**Lithuania** reported data based on complete surveys. However, data was not reported for the two first years of the reporting cycle.
Luxembourg	In **Luxembourg**, only three species are huntable, and bags provided are based on complete surveys.
Malta	**Malta**'s reported harvest data were all based on complete survey and is mandatory.
Romania	**Romania** reported mostly complete surveys, except 2 absent data.
Slovenia	All harvest data reported by **Slovenia** are based on complete survey.
Slovakia	All harvest data reported by **Slovakia** are based on complete survey.

Medium	
Austria	In **Austria**, the values provided are based on complete survey for 7 species and data were missing from 3 species, which are expected to have a very low harvest. The rest of the huntable species consisting of 10 species of ducks and 4 species of pigeons and doves are grouped under the two headings "wild ducks" and "wild pigeons". It is therefore difficult to use the bag data for ducks and pigeons. However, these estimates mainly account for Mallards in the duck group and Wood Pigeon in the pigeon group. For these species, contact with national experts would be required to break down the figures.
Cyprus	In **Cyprus**, reporting harvest data is voluntary. A yearly survey is conducted to estimate the total harvest. Good bag data were provided for 8 species individually. However, several species were grouped for the reporting of their bag. A first group with 2 corvid species, a second one grouping Common Snipe and Jack Snipe with the Woodcock (which accounts of more than 95% of the figure reported), a third group for 2 species of thrushes, and a fourth group for 2 species of pigeons for which 99% of the figure reported accounts for Wood Pigeons. No data were provided for waterbirds (11 species) as the numbers are negligible since almost all wetlands are 'no hunting' areas, according to the Game & Fauna Service bag statistics reports.
Czech Republic	In **Czechia**, harvest reporting is mandatory and good data were provided for 7 species individually but grouped bag data were provided for 3 species of geese and 2 species of ducks (with only maximum values given).
Germany	In **Germany**, reporting is mandatory. Mostly partial estimates are given as bag data a missing regionally. Moreover, only minimums or maximums are given; there is some absent data, and the bags can partly contain game species that died from other causes than hunting. Further, most of bags are reported for the breeding season, although hunting takes place in winter.
Spain	Data reported by **Spain** mainly consist of partial estimates (28 species). Complete surveys are reported for 6 species, with an expert estimate for 1 species, and absent data for 2 species.
France	The data reported by **France** are the product of a robust scientific process, however, it is only available for one season (2013-14). No yearly reporting of bag data exist in France and surveys are periodically conducted to estimate the harvest size, the last one was made for the season 2013-14 (Aubry *et al* 2016) and provides a good estimate of the harvest in France.
Croatia	**Croatia** reported data several times for the same species but under different seasons. This resulted in a higher number of reports of absent data than is really the case, as data are reported for another season. For 6 species, data are missing, the rest mainly consist of expert estimates.

Italy	In **Italy**, reporting harvest data is mandatory but all data were reported as absent data. However, data are present for around half of the country's regions for 4 hunting seasons. Out of 21 regional administrations, 12 provided hunting statistics for 2014-2015, 15 for 2015-2016, 14 for 2016-2017 and 9 for 2017-2018. No data were available for 2012-2013 and 2013-2014. These values are then not usable as such but could require a basis for extrapolation to get estimates of the national bags. However, national estimates were presented by the FDIC at the IUGB congress in 2017, which could provide a good basis to work with, although bags are expected to have decreased since then.
Latvia	**Latvia** reported nearly all of the data as absent. However, data are reported for all species and correspond to the reports by hunters to the State Forest Service. Reporting harvest data is mandatory.
Poland	In **Poland**, reporting is mandatory. Waterbird bag estimates are based on the percentage share in all hunted ducks or geese in the season 2015/2016. These are reported as partial estimates. The rest of the reports are complete surveys based on data from season 2012/2013 to 2017/2018 published by research station of the Polish Hunting Association.
Portugal	The data reported by **Portugal** contains half of complete surveys and half of partial estimates, but both are described as covering 80-85% of the hunting farms, except for the Turtle Dove.
Sweden	All harvest data reported by **Sweden** is designated as partial estimates (except absent data for both sub-species of the Bean Goose). The harvest data reporting is made on a voluntary basis by hunters, which may be the reason why the official statistics are labelled as such.
No data	
Ireland	No data were submitted by **Ireland**. Although there is no statutory scheme in place, there is a programme to collect harvest data, being run by the national game shooting association (the National Association of Regional Game Councils). This is a voluntary scheme for which a questionnaire is sent annually to all hunters affiliated to the NARGC - *circa* 26,000 hunters in *circa* 1000 local hunting clubs.
Netherlands	For the **Netherlands**, no data were provided although a bag data collection system exists in the country. This concerns only three species of birds that are huntable in the Netherlands (the Pheasant, Mallard and Wood Pigeon). Other estimates of numbers of bird harvested are to be provided under the derogation system reporting.
UK	The **UK** has no statutory bag recording scheme, although some voluntarily bag data recording schemes exist and information is available from other sources, e.g. the GWCT's National Gamebag Census (see Aebischer, (2019) which provides bird bag data estimates for 2004, 2012, and 2016).

4. WHAT IS MISSING?

In light of these findings, a rather good response rate by Member States is highlighted for this first cycle of reporting under the Birds Directive involving the reporting of harvest data for the period 2013-2018.

The first major gap is **missing data from two EU Member States** (the Netherlands and Ireland) and for the UK. However, data exists in these countries, at least to some extent. For example, in the UK, the GWCT established in 1961 their National Gamebag Census, which produces bag data annually. Aebischer (2019) provided estimates for the bird harvest in the UK for the season 2016, based on this census. National bag estimates for the Netherlands also exist but were not reported. These could therefore be requested when needed. Efforts should urgently be undertaken in Ireland to put in place a national bag reporting system. The NARGC in Ireland runs voluntary scheme to gather bird harvest data annually in Ireland.

A second issue is the reporting of **harvest data for groups of species**. This mainly relates to waterbirds that are grouped by "ducks" and "geese", but also *columbids* species, which are sometimes reported together in some Member States. To be usable, these figures would need to be broken down to the species level. In most cases, one species of the group accounts for the vast majority of the bird harvested, e.g., the Mallard for ducks, the Greylag Goose for geese or the Wood Pigeon for pigeons and doves, making the task less complicated than expected. Even when not knowing the exact values of less hunted species gathered in the group, an expert percentage would be accurate enough to contribute to species management plans.

The third issue relates to the reporting of **partial estimates**, e.g., harvest estimates for only half of the regions in Italy, which can then result in underestimating the harvest of a country. In these cases, the values provided should not be considered as national bag estimates and further work is required to produce such estimate. Therefore, these incomplete data should be used as a basis to produce estimates at national level. As a practical example, this was done by the Italian Hunting Federation (FDIC) in order to present waterbirds harvest estimates for Italy at the International Union of Game Biologists (IUGB) in 2017.

5. USEFULNESS OF THE HARVEST DATA?

Despite these issues, good data were provided by most Member States, and this represents a wealth of information. To make best use of the information, efforts should be undertaken to better understand the datasets of lower quality, rather than dismissing them on their entirety.

When insufficient quality of data is encountered (e.g., incomplete datasets), the user should seek to work with the data to make it more usable, e.g., extrapolation of partial estimates.

To this end, a network of experts on harvest data (e.g., one for each country/region) should be a prerequisite to develop reliable comparisons and to understand the compilation of the different hunting bag collecting schemes throughout Europe, as previously called for by Aubry *et al* (2020a).

As for population estimates, seeking for absolute values should not be encouraged as there will always be a discrepancy between the parameter values and the estimates obtained (Aubry *et al.*, 2020a). Consequently, this uncertainty must be acknowledged and well understood to support sound conservation and management decisions based on hunting bag estimates (Aubry *et al.*, 2020a).

Moreover, for some species, good quality data were reported by Member States. For example, this is the case for the Common Eider, which is huntable in France, but only a few individuals are shot which is negligeable. For the same species, Sweden reported quite good data, and Denmark, Estonia, and Finland reported good data (and in Norway which does not report under the Birds Directive).

Recently, the harvest data was used in the framework of the European Commission's Turtle Dove Adaptive Harvest Management process where national harvest estimates were used in the population models. There was a similar situation for the Common Eider action plan. The use of this data in the Turtle Dove Species Action Plan enabled the stimulations needed to make progress in bag data recording. Since the start of the Turtle Dove AHM in 2021, several Member States have already put in place online harvest recording systems through applications allowing to track the harvest towards the national quota in real time in order to close the hunting of the species when the quota is reached.

For FACE, these findings show that while the dataset is not perfect, there is much more scope for use of this data, which FACE encourages.

6. RECOMMENDATIONS

Because harvest data play a significant role in assessing the sustainability of hunting (at the same level as population size estimates), FACE urges relevant Member States:

To take actions towards the improvement of data treatment where required, to provide decision makers and other users with readily usable harvest estimates.

To work with relevant experts (including in national hunting associations) in advance of reporting harvest data under the Birds Directive reporting processes.

To make greater efforts to improve harvest data clarity where needed;

To separate grouped bag data reporting, so it is broken down to the species level.

Ensure that results are representative at species and country levels.

Member States that did not report data for the 2013-18 reporting cycle should be urged to do so for the 2019-24 and

To advance toward these goals, close cooperation with hunting associations and the use of online applications could be a good way of collecting data, especially for less hunted species. Hunters remain key players in collecting bag data but can only do so when effective systems are in place.

Analysis and reporting back to stakeholders are crucial to ensure harvest data delivers results for all stakeholders and data are improved in the next reporting cycle.

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