BASC Wing Survey – Annual Report for 2023/2024

Summary
In total 1,912 wings were submitted over the 2023/24 season with wigeon being the most commonly submitted duck wing (896 wings), followed by teal (336 wings) and mallard (300 wings). Wildfowl shot in BASC's Northern region made up the largest proportion of wing submissions, followed by BASC Eastern region.

Focussing on the two largest samples, we observed that the percentage of juvenile wigeon within the wing sample dropped below 40% for the first time since the 1992/93 season. The wigeon population wintering in the UK is undergoing a short-term decline, primarily attributed to issues on breeding grounds. This decline in juveniles may reflect decreasing reproductive output within the population and will be monitored closely in future wing survey samples. The teal wing sample shows a continued decline in the proportion of juveniles in the sample, however this population at a UK, European and flyway level appears to be increasing. Continued collection of teal wings will compliment any population surveys and contribute to understanding of any changes to the teal population going forward.

Introduction
The BASC Wing Survey (previously named the 'Duck Production Survey') was started in 1965, initially to increase our understanding of the changing duck numbers wintering in the UK each year. The survey has continued since then, with substantial variation in species focus and sample collection effort, with annual sample sizes ranging from 145 wings to 6,564 wings. In recent years, wing submissions have declined in part due to Covid-19 and Avian Influenza. We now encourage all shooters to submit wings from any waterfowl they harvest, with particular focus on teal, wigeon and the species highlighted in the Sustainable Shooting Code of Practice for Wildfowl Quarry Species.

Wing surveys are utilised in other countries to great effect. The 'Migratory Bird Parts Collection Survey' or Wing Survey asks a sample of hunters from around the USA to send one wing from each quarry bird they shoot in pre-paid envelopes. This enables the US Fish and Wildlife Service to collect 90,000 duck wings and 20,000 goose tails and wing tips each year[1]. The data collected from these submissions provide information on the extent and distribution of harvest and most importantly, the data informs population modelling that guides adaptive harvest management. From the submitted wings and hunter reports[2], wildlife managers are able to annually evaluate and adjust hunting season lengths and in some cases, harvest limits.

In Europe, wing surveys are also utilised as a means of understanding population composition of quarry species[3–6]. Wing data complements bird counts and adds further detail about the proportion of adults and juveniles or males and females within the population. When the number of wings submitted is high, these datasets can provide accurate information on the composition of the hunting bag and even when taking into account hunter biases [6,7], this is also representative of the standing population composition.

The ratio of adults to juveniles and the number of juveniles per adult female birds can predict or explain trends in the overall population. For example, a high proportion of juvenile birds can indicate high reproductive productivity, and we would expect future population growth as these youngsters are recruited into the adult population. Low female and/or juvenile numbers may indicate low productivity

or high mortality at breeding grounds. This could explain or predict a population decline due to a limited number of young birds adding to the adult population. These ratios can vary between seasons but also within a season as birds of different sexes and ages can migrate at different times. By reporting the date each bird was shot when wings were submitted, we can start to build a picture of migrant arrival and departure each year, as well as annual population trends.

Going forward, BASC aims to provide a report of wing submissions each year, with a more detailed assessment of trends where possible every 3-5 years. This assessment will align with a more comprehensive review of bag return and survey data to inform the Sustainable Shooting Code of Practice for Wildfowl Quarry Species and the species-specific recommendations within it.

Case Study: Northern pintail

What do we already know about pintail?

Northern pintail are rare breeders in the UK, with an estimated 27 resident breeding pairs. Surveys of wintering birds show a 10-year wintering population decline in the UK of 22% between 2008 and 2018[8], with the current population estimated to be 20,000 individuals [9]. This decline is reflected on the European continent within breeding populations in European Russia, Finland and Sweden, and is anticipated to continue[8]. However, due to its large range and relatively high abundance, pintail are not yet considered 'Vulnerable' to extinction at a global level [10].

Habitat loss, driven by both climate change (increased drought) and anthropogenic factors (abstraction and agricultural intensification) are considered major drivers of pintail decline and the populations' current failure to recover [11–15]. These pressures are likely leading to high adult female mortality and reduced productivity[16,17].

What does the BASC wing survey data tell us?

Pintail wings have been collected throughout the duration of the wing survey, but collection has been very inconsistent. However, the composition of adults and juveniles in the samples contributes to our understanding of historic and ongoing population trends.

From the samples that have been submitted, we observe that from 1990 to 2000, the percentage of juveniles declined consistently from over 60% in 1990 to less than 20% in 2000 (Fig. 1). When compared to European population data trends, which showed a significant pintail population decline in the early 2000s[18], it is possible this observed reduction of juveniles contributed to the downturn in numbers. With relatively short-lived birds such as pintail, the level of juvenile recruitment (i.e. the number of juvenile birds surviving and becoming part of the breeding adult population) can substantially impact population growth.

More recently, the percentage of juveniles submitted to the wing survey has increased slightly. Since the 2018/19 season, over 40% of the sample are now juvenile birds (See Fig. 1). In parallel, European census data indicates there has been a degree of population recovery since 2010[19]. Therefore, if we assume our wing sample is representative of the standing population of pintail, this increase in reproductive output by females, and increased survival of juvenile birds is likely the driver of the observed population increase.

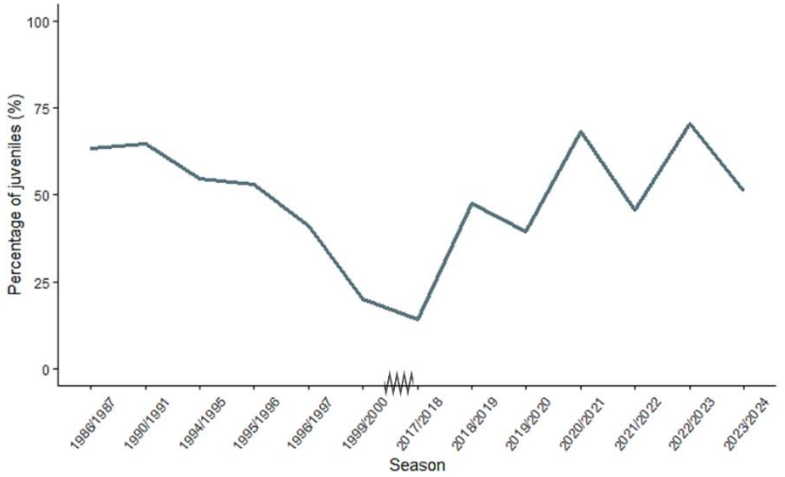

Figure 1. The proportion of juvenile pintail in the BASC Wing Survey sample per season between 1986/97 and 2023/24 (Note: the survey was discontinued between 2002 and 2017, indicated by a jagged line).

How has wing data informed shooting?

As with many duck species, pintail populations are male dominated[20], with BASC Wing Survey data suggesting that on average, 65% of the adult population is male. When considering the ongoing pressures on pintail and the likely factors driving decline, the BASC Sustainable Shooting Code of Practice for Wildfowl Quarry Species recommends that *'a maximum of two birds per person, per day'* is an appropriate level of harvest and that *'males should be preferentially shot'* to reduce pressure on female and juvenile birds.

Continued submission of wings will help us to a) understand the changing pintail population composition and b) understand hunter behaviour in response to BASC recommendations.

Species summaries for season 2023/24

Here we present the data on wings submitted during the 2023/24 hunting season. In most cases, sample sizes are too small to draw any meaningful conclusions about population composition and are unlikely to be representative of true harvest. However, the publication of such data is vital to highlight where greater submission effort is required and showcase the potential that this dataset has if sample sizes can be substantially increased.

Ducks

Gadwall – *Mareca strepera*

A total of 33 gadwall wings were submitted to the BASC Wing Survey in the 2023/23 season. This comprised a total of 42.4% adults and 57.6% juveniles, and the reproductive index was 6.33 juveniles per adult female. Figure 2 shows a full sex and age breakdown of the gadwall sample. The current available data suggests that annual harvest of gadwall is approximately 4,900 birds[21]. A greater return rate of gadwall wings is required to allow us to have a representative sample of shot birds. This will allow us to confidently assess the population composition.

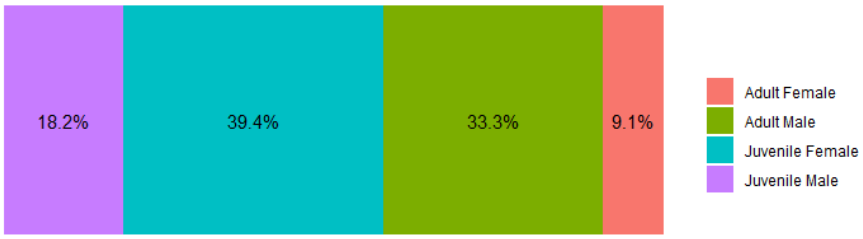

Figure 2. Summary of 33 gadwall wings submitted from the 2023/24 season.

Goldeneye – *Bucephala clangula*

No goldeneye wings were submitted to the BASC Wing Survey in the 2023/24 season. The current available data suggests an annual harvest of goldeneye is approximately 450 birds[21]. A greater return rate of goldeneye wings is required to allow us to have a representative sample of shot birds. This will allow us to confidently assess the population composition.

BASC's Sustainable Shooting Code of Practice for Wildfowl Quarry Species advises to delay shooting of goldeneye until October where resident breeding goldeneye are present. By delaying shooting until migrant birds arrive, this is intended to alleviate any possible hunting pressure on the small breeding population resident in the UK. The submission of all goldeneye wings is encouraged and will enable BASC to monitor the distribution and timing of goldeneye harvest.

This species wing records are data deficient.

Mallard – *Anas platyrhynchos*

A total of 300 mallard wings were submitted to the BASC Wing Survey in the 2023/24 season. This comprised 60% adult mallard and 40% juveniles. Figure 3 shows a full sex and age breakdown of the sample. We will continue to collect data on mallard wings as this will help us document the composition of the mallard bag. However, we cannot determine the provenance of mallard from wings alone and therefore cannot confidently draw conclusions about the composition of the wild mallard population. BASC specifically asks shooters not to submit mallard wings that were shot on sites that have reared and released mallard however we cannot guarantee that no reared and released mallard are submitted to the survey.

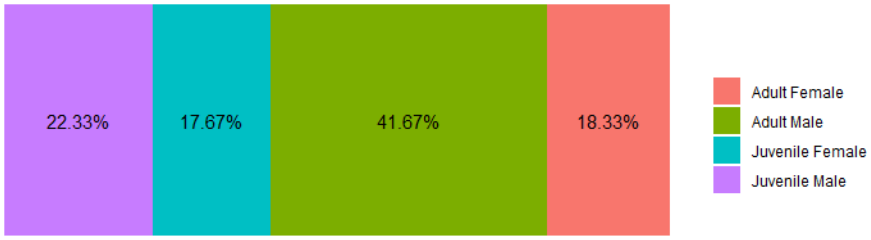

Figure 3. Summary of 300 mallard wings submitted from the 2023/24 season.

Northern pintail – *Anas acuta*

A total of 51 pintail wings were submitted to the BASC Wing Survey in the 2023/24 season. This comprised total of 49% adults and 51% juveniles, and the reproductive index was 3.25 juveniles per adult female. Figure 4 shows a full sex and age breakdown of the sample. The current available data suggests an annual harvest of pintail is approximately 680 birds[21]. Although this harvest should remain small, a greater return rate of pintail wings is required to allow us to have a representative sample of shot birds. This will allow us to confidently assess the population composition.

BASC's Sustainable Shooting Code of Practice for Wildfowl Quarry Species advises to preferentially shoot adult male pintail where possible. This is intended to alleviate any possible hunting pressure on reproductive females and enhance the number of juveniles produced that can add to the adult population. Although this may lead to a biased submission of male wings to the Wing Survey, it will enable BASC to monitor any changes in selective shooting of pintail over time.

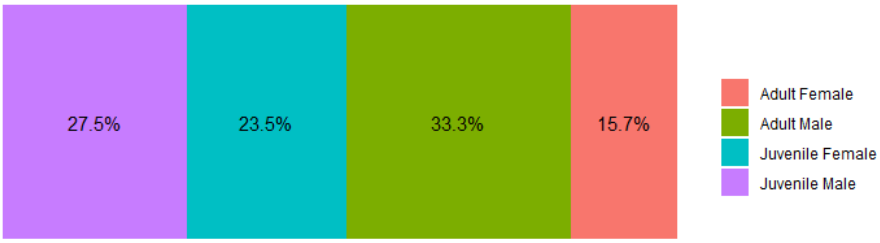

Figure 4. Summary of 51 pintail wings submitted from the 2023/24 season.

Common pochard – *Aythya farina*

Only 13 pochard wings were submitted to the BASC Wing Survey in the 2023/24 season. This comprised of 69.3% adult and 30.7% juveniles. Figure 5 shows a full sex and age breakdown of the sample. The current available data suggests an annual harvest of pochard is approximately 370 birds[21]. As a result, the number of wings submitted to the Wing Survey are low. However, a greater return rate of pochard wings is required to allow us to have a representative sample of shot birds. This will allow us to confidently assess the population composition.

BASC's Sustainable Shooting Code of Practice for Wildfowl Quarry Species advises a voluntary moratorium on the shooting of pochard. This is intended to alleviate any possible hunting pressure on ongoing population declines. However, wings of any pochard shot should be submitted to the BASC Wing Survey to help us understand the composition of the declining population in the UK and the distribution of its harvest.

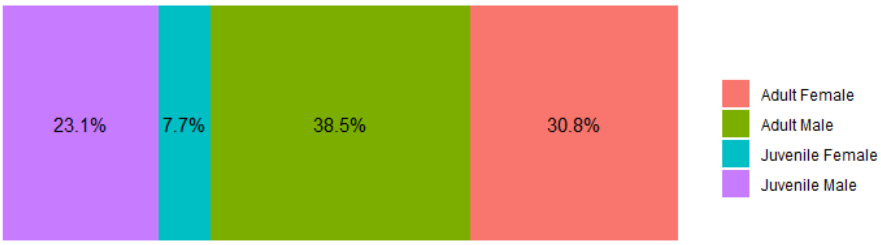

Figure 5. Summary of 13 pochard wings submitted from the 2023/24 season.

Greater scaup – Aythya marila

Scaup can only be harvested in Northern Ireland. The BASC Wing Survey has not received any wing submissions of scaup since 1982/83.

This species wing records are data deficient.

Shoveler – *Spatula clypeata*

A total of 8 shoveler wings were submitted to the BASC Wing Survey in the 2023/24 season. This comprised of two adult males, five juvenile males and one juvenile female. The current available data suggests and annual harvest of 1,900 birds[21]. A greater return rate of shoveler wings is required to allow us to have a representative sample of shot birds. This will allow us to confidently assess the population composition.

This species wing records are data deficient

Eurasian teal – *Anas crecca*

A total of 336 teal wings were submitted to the BASC Wing Survey in the 2023/24 season. This comprised of 58% adults and 42% juveniles, and the reproductive index equated to 1.98 juveniles per adult female. Figure 6 shows a full sex and age breakdown of the sample. The current available data suggests an annual harvest of teal is approximately 140,000 birds[21]. This highlights the potential for greater submission rates in future seasons. A greater return rate of teal wings will allow us to continue to confidently assess the population composition.

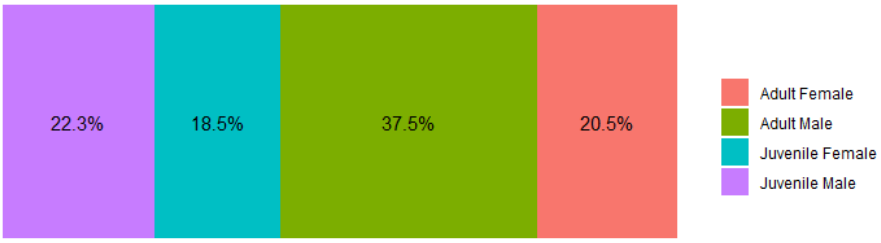

Figure 6. Summary of 336 Eurasian teal wings submitted from the 2023/24 season.

Tufted duck – *Aythya fuligula*

A total of 28 tufted duck wings were submitted to the BASC Wing Survey in the 2023/24 season. Due to the challenges in sexing tufted duck from the wing alone, we only record age data from this species. The ratio of adult to juvenile birds in the sample is displayed in Figure 7. The current available data suggests that the annual harvest for tufted duck is 4,900 birds [21]. A greater return rate of tufted duck wings is required to allow us to have a representative sample of shot birds. This will allow us to confidently assess the population composition.

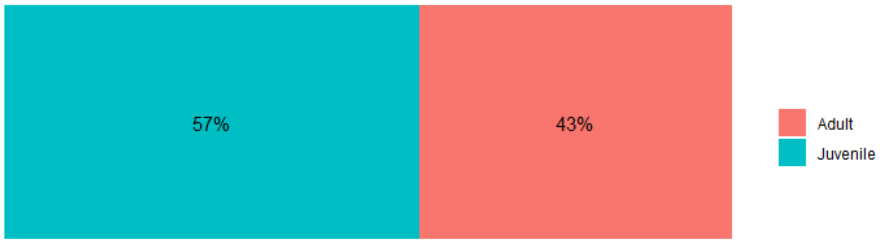

Figure 7. Summary of 28 tufted duck wings submitted from the 2023/24 season.

Eurasian wigeon - *Mareca Penelope*

A total of 896 wigeon wings were submitted to the BASC Wing Survey in the 2023/24 season. This comprised of 60.4% adults and 39.6% juveniles, and the reproductive index equated to 2.66 juveniles per adult female. Figure 8 shows a full sex and age breakdown of the sample. The current available data suggests an annual harvest of wigeon is approximately 43,000 birds [21]. A greater return rate of wigeon wings will allow us to continue to confidently assess adult-juvenile and male-female ratios.

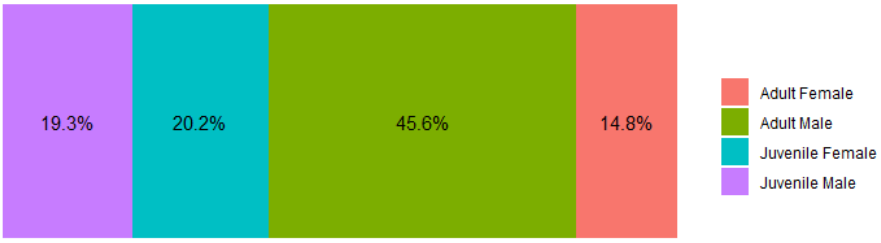

Figure 8. Summary of 896 Eurasian wigeon wings submitted from the 2023/24 season.

Geese

NOTE:

- *Goose wings can be submitted to the BASC Wing Survey as photographs through the EpiCollect app and do not need to be posted.*
- *Sex cannot be determined from goose wings so we are unable to comment on the ratio of males and females for all goose species.*

Canada goose – *Branta canadensis*

A total of 39 Canada goose wings were submitted to the BASC Wing Survey in the 2023/24 season. This comprised 46.2% juveniles and 53.8% adults. The current available data suggests an annual harvest of 27,000 birds [21]. A greater return rate of Canada goose wings will allow us to continue to confidently assess adult-juvenile ratios.

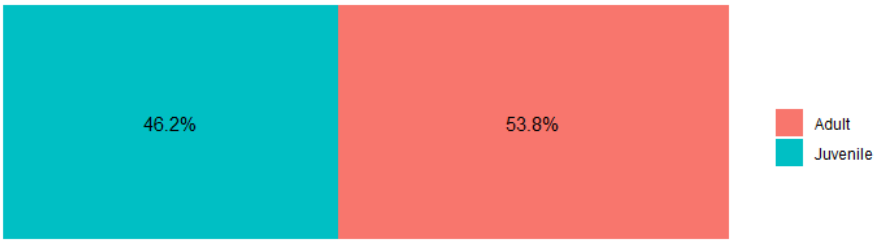

Figure 9. Summary of 39 Candan goose wings submitted from the 2023/24 season.

Greylag goose – *Anser anser*

A total of 41 greylag goose wings were submitted to the BASC Wing Survey in the 2023/24 season. This comprised 53.7% juveniles and 46.3% adult. The current available data suggests an annual harvest of 58,000 birds [21]. A greater return rate of greylag goose wings will allow us to continue to confidently assess adult-juvenile ratios.

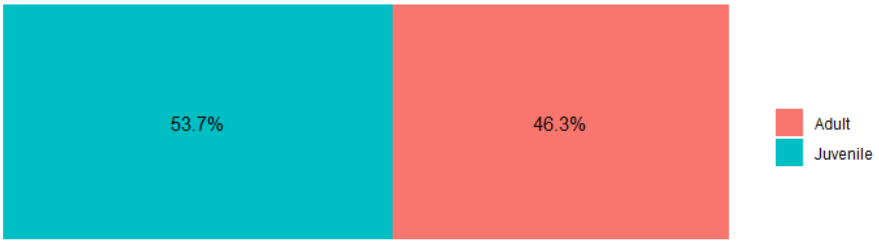

Figure 10. Summary of 41 greylag goose wings submitted from the 2023/24 season.

Pink-footed Goose – *Anser brachyrhynchus*

A total of 90 pink-footed goose wings were submitted to the BASC Wing Survey in the 2023/24 season. This comprised 47.8% juveniles and 52.2% adult. The current available data suggests an annual harvest of pink-footed goose is approximately 10,000 birds [21]. A greater return rate of pink-footed goose wings will allow us to continue to confidently assess adult-juvenile ratios.

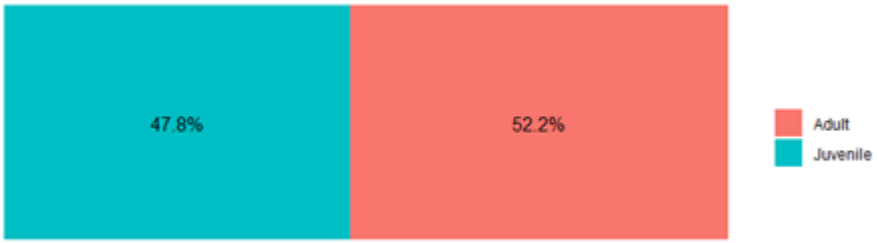

Figure 11. Summary of 90 pink-footed goose wings submitted from the 2023/24 season.

European white-fronted goose – *Anser albifrons*

NOTE

- *This species can be harvested in England and Wales only.*

Only one EWFG wing was submitted to the BASC Wing Survey in the 2023/24 season. The current available data suggests the annual harvest of EWFG is less than 100 birds [21]. All wings of shot EWFG should be submitted to BASC Wing Survey to allow us to confidently assess adult-juvenile ratio.

BASC's Sustainable Shooting Code of Practice for Wildfowl Quarry Species advises to take a maximum of two birds, per person, per day. Due to the species distributional shift driven by climate change, it is important that we collect data on the remaining individuals overwintering in the UK. We therefore encourage all wings of shot EWFG to be submitted to the BASC Wing Survey so we can better understand the population composition and distribution in the UK.

This species wing records are data deficient

Waders

NOTE

- *Wader sex cannot be determined from wings so we are unable to comment on the ratio of males and females in all samples.*

Common snipe – *Gallinago gallinago*

Only 15 snipe wings were submitted to the BASC Wing Survey in the 2023/24 season. This comprised a total of 67% adults and 33% juveniles (Figure 12). The current available data suggests the annual harvest of common snipe is approximately 85,000 birds[21]. A greater return rate of snipe wings is required to allow us to confidently assess adult-juvenile ratios.

BASC's Sustainable Shooting Code of Practice for Wildfowl Quarry Species advises to delay shooting of snipe until September where resident snipe are present. This is intended to alleviate any possible hunting pressure on breeding snipe early in the season. Increased submission of snipe wings is required to enable BASC to assess the adult-juvenile ratios of the UK population as well as the distribution and timing of harvest.

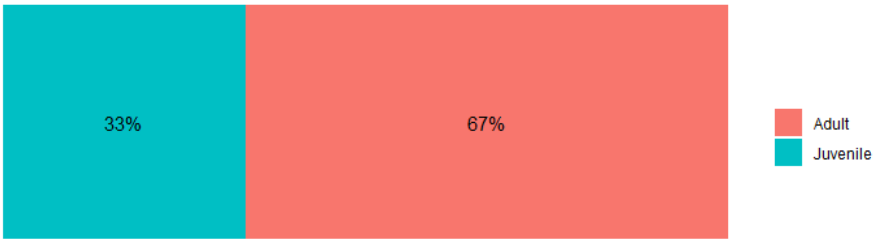

Figure 12. Summary of 15 snipe wings submitted from the 2023/24 season.

Golden plover – *Pluvialis apricaria*

No golden plover wings were submitted to the BASC Wing Survey in the 2023/24 season. A total of five wings have been submitted to the survey since the 2018/19 season. The current available data suggests the annual harvest of golden plover is approximately 870 bird [21]. A greater return rate of golden plover wings is required to allow us to confidently assess adult-juvenile ratios.

This species wing records are data deficient

Jack snipe - *Lymnocryptes minimus*

Note: This species can be harvested in Northern Ireland only.

No jack snipe wings were submitted in the 2023/24 season, nor have ever been submitted to the BASC Wing Survey. The current available data suggests the annual harvest of jack snipe is less than 100 birds[21].

This species wing records are data deficient

Eurasian woodcock – Scolopax rusticola
A total of 70 woodcock wings were submitted to the BASC Wing Survey in the 2023/24 season. This comprised a total of 56% adults and 44% juveniles (See Fig. 13). The current available data suggests the annual harvest of woodcock is less than approximately 140,000 birds[21]. A greater return rate of woodcock wings is required to allow us to confidently assess adult-juvenile ratios.

BASC's Sustainable Shooting Code of Practice for Wildfowl Quarry Species advises to delay shooting of woodcock until late-November where resident woodcock are present. This is intended to alleviate any possible hunting pressure on resident breeding woodcock. Continued submission of woodcock wings will enable BASC to continue to monitor the timing and distribution of woodcock harvest in the UK.

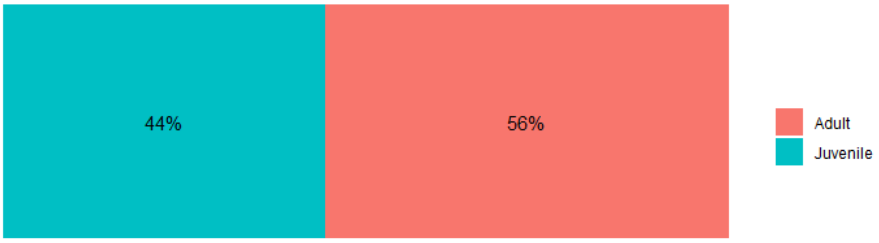

Figure 13. Summary of 70 woodcock wings submitted from the 2023/24 season.

Rails

NOTE
- *These species can be harvested in England, Wales and Scotland only.*
- *Rail sex cannot be determined from wings so we are unable to comment on the ratio of males and females in all samples.*

Eurasian coot – *Fulica atra*
No coot wings were submitted in the 2023/24 season, nor have any coot wings ever been submitted to the BASC Wing Survey.

Wings from any birds shot should be submitted to BASC to enable us to better understand the distribution of harvest and the adult-juvenile ratios of shot birds.

This species wing records are data deficient

Common Moorhen – *Gallinula chloropus*
No moorhen wings were submitted in the 2023/24 season. The BASC Wing Survey has only received two moorhen wings which were submitted in 2022/23.

Wings from any birds shot should be submitted to BASC to enable us to better understand the distribution of harvest and the adult-juvenile ratios of shot birds.

These species wing records are data deficient

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