WWT/JNCC/NatureScot Goose & Swan Monitoring Programme survey results 2019/20

Bewick's Swan *Cygnus columbianus bewickii*

1. Abundance

The abundance of Bewick's Swans in the UK and the Republic of Ireland in 2019/20 was monitored through the Wetland Bird Survey (WeBS) and the Irish Wetland Bird Survey (I-WeBS), respectively. Results from these schemes are presented in survey reports which are available to download from the schemes' websites.

The International census of the Northwest European Bewick's Swan population is carried out every five years. The 9th international census was carried out in January 2020 and the results will be available in autumn 2021.
The census is organised across Europe by the IUCN SSC Swan Specialist Group, and coordinated in Britain and Ireland by WWT in partnership with Birdwatch Ireland and the Irish Whooper Swan Study Group.

The 8th census of Bewick's Swans in Britain and Ireland was undertaken in January 2015 as part of the international census. The census yielded a total of 4,371 Bewick's Swans in Britain and 21 in Ireland, which together represented a decline of 38% compared with the Britain and Ireland total recorded in 2010 and was the lowest census derived total since the peak in 1990 (Figure 1). Numbers across the flyway peaked at 29,780 individuals in 1995, but then declined by 39.4% to 18,057 in 2010, before showing a partial recovery to 20,149 birds in 2015 (Figure 1; Beekman *et al*. 2019).

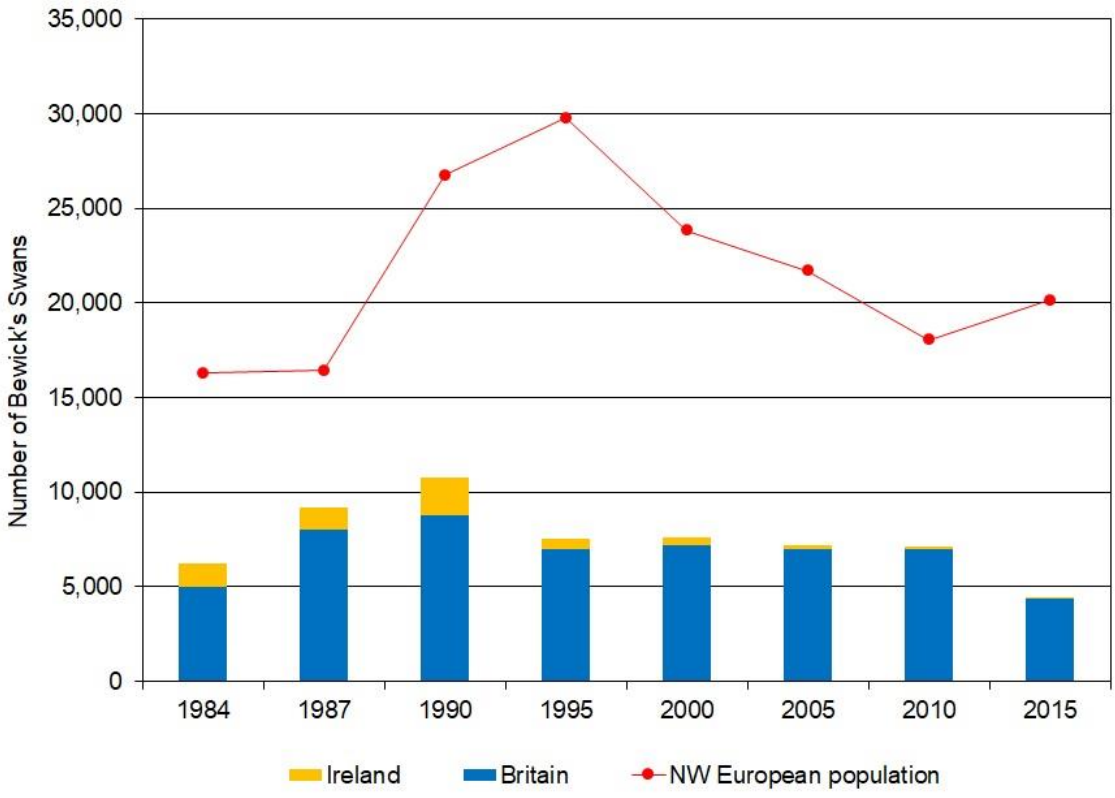

Figure 1. Number of Bewick's Swans recorded in Britain and Ireland during the International Swan Census (columns) and the Northwest European population estimate (line; Beekman et al. 2019), 1984–2015.

2. Breeding success

Bewick's Swan age assessments were conducted in three regions across England during mid-winter 2019/20 (10–14 January 2020), to coincide with the International Swan Census when age counts were undertaken elsewhere in the flyway. A relatively high proportion of early arrivals in Britain (*i.e.* those present in October and November) typically comprise mostly non/failed breeders (Rees *et al*. 1997), whereas age assessments made in mid-winter can be taken as being more representative of the population as a whole.

A total of 1,197 Bewick's Swans was aged: 1,094 in East Central England, 14 in Northwest England and 89 in Southwest England (Table 1). Brood sizes were recorded for 52 families.

Overall, Bewick's Swan flocks contained 8.5% cygnets, which is notably lower than the previous ten-year average recorded at wintering sites in England (11.9% ± 1.13 SE for 2009/10–2018/19). Conversely, the mean brood size of pairs with young was slightly higher than average with 1.87 cygnets recorded compared with 1.66 (±0.05 SE) for 2009/10–2018/19 (Table 1).

Table 1: The percentage of young (%) and mean brood size for Bewick's Swans at sites in England during the 2019/20 winter (regions defined below).

Region	Total aged (number of young)	Percentage of young (%)	Number of broods	Mean brood size
East Central England	1,094 (90)	8.2	47 (85)	1.81
Northwest England	14 (1)	Limited data	1(1)	Limited data
Southwest England	89 (11)	12.4	4 (11)	2.75
Overall	**1,197 (102)**	**8.5**	**97**	**1.87**

*Regions (counties from which data were received in 2019/20):

- East Central England: Cambridgeshire (WWT Welney, Ouse Washes, Nene Washes), Norfolk (Ouse Washes, Burnham, Holkham, Ludham) and Kent (Walland Marsh and the Isle of Sheppey).
- Northwest England: Lancashire (Ribble Estuary).
- Southwest England: Gloucestershire (WWT Slimbridge).

During the January 2020 census, a very small number of Bewick's Swans were also recorded in Ireland, where numbers have decreased greatly in recent decades: just 12 Bewick's Swans were recorded and aged, of which four were juveniles (33.3%).

Age assessments of Bewick's Swans have been regularly undertaken at and around WWT Centres (WWT Welney/Ouse and Nene Washes, WWT Slimbridge and WWT Martin Mere/Ribble Estuary) since the early 1960s. In 2019/20, the mean percentage of young in flocks assessed for these sites combined was 8.6% (1,103 birds aged) (Figure 2), which was lower than the previous ten-year mean (11.9% ± 1.13 SE).

Conversely, the combined mean brood size of 2.1 cygnets for the 35 broods assessed was higher than the previous ten-year mean (1.7 ± 0.06 SE). In recent years, few or no birds have been recorded at the Ribble Estuary and WWT Martin Mere, particularly at the latter site. For years when only a small sample size (<15 birds aged) was assessed at these sites, the data have been excluded from this analysis: for 2011/12 and 2015/16 to 2019/20.

In 2019/20, there was regional variation in the distribution of families, with a higher percentage of young found at WWT Slimbridge in Southwest England compared with WWT Welney/Ouse and Nene Washes in the east (Figure 3).

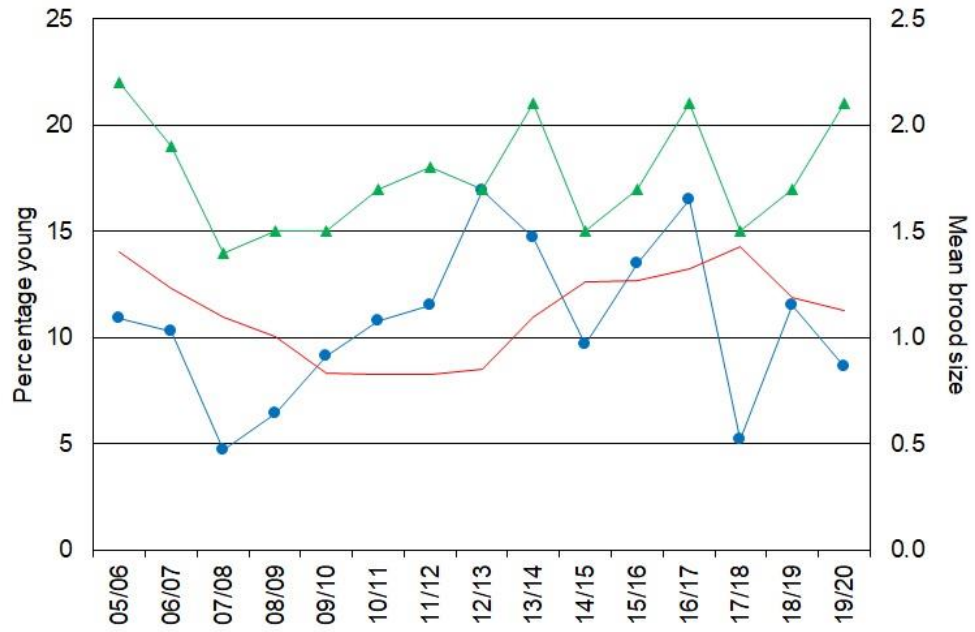

Figure 2. The percentage young (blue circles), with the rolling five-year mean (red line), and mean brood size (green triangles) for Bewick's Swans recorded around WWT centres, (WWT Slimbridge, WWT Welney/Ouse and Nene Washes, and WWT Martin Mere/Ribble Estuary), 2005/06–2019/20. Five-year mean values for the percentage of young were calculated for the five years preceding the year in question (e.g. mean presented for 2019/20 is for 2014/15–2018/19).

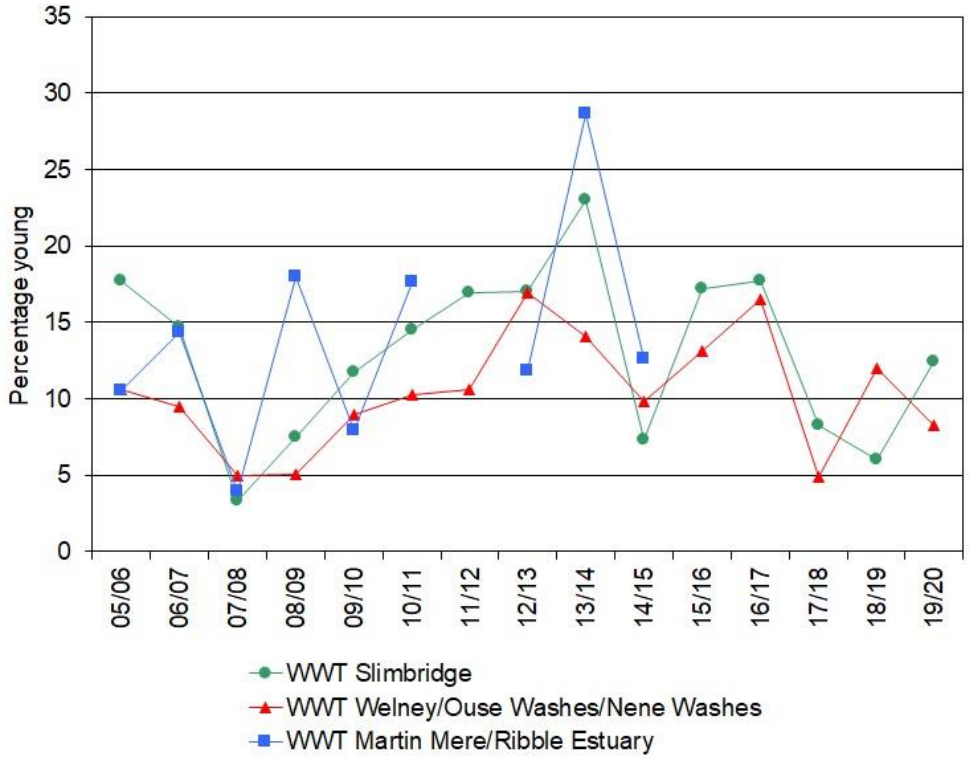

Figure 3. The percentage of young Bewick's Swans recorded at WWT Slimbridge, WWT Welney/Ouse and Nene Washes and WWT Martin Mere/Ribble Estuary, 2005/06–2019/20. The percentage young for WWT Martin Mere/Ribble Estuary was not calculated for 2011/12 and 2015/16 to 2019/20 due to small sample sizes (<15 swans aged).

3. Discussion

These data indicate that Bewick's Swans wintering in England experienced a relatively poor breeding season in 2019 with 8.5% young recorded for flocks across England, this being lower than the ten-year mean (13.9%).

There was regional variation in the distribution of Bewick's Swan families recorded in different parts of England, with a higher percentage of young found in Southwest England than in Central East England; this being highlighted by the data collected at and around WWT Centres (Figure 3). This may reflect the tendency for smaller flocks, such as those recorded in Southwest England, to include a higher proportion of families than the larger flocks, whereas the latter may include a higher proportion of non-breeding (or failed) birds (Rees *et al.* 1997). Recent analysis of nearly 50 years of leg-ring and neck-collar resightings data recorded during the 1970–2017 has found that Bewick's Swans have shifted eastwards ("short-stopping"), and are also staying for shorter periods in the wintering range ("short-staying"), over the study period (Nuitjen *et al.* 2020). These finding are in line with the results of the international swan censuses, which illustrate an eastward contraction of the swans' wintering distribution in Britain and Ireland (Worden *et al.* 2006, Beekman *et al.* 2019).
The results from England reflected those of the international age count held across Europe in December 2019, which showed that overall, Bewick's Swans experienced a poor breeding season in 2019. Of the 9,188 swans aged in ten countries across northern Europe (including England), 6.6% young were found in those flocks surveyed, this being below the previous ten-year mean of 9.1% young (2009–2018) (W. Tijsen. Pers. comm). The mean brood size of 195 families aged was 1.85 young per successful pair. With increasing numbers of Bewick's Swans wintering further east, a new record of 1,280 birds was recorded in Poland in mid-December and age assessments from Estonia were received for the international age count for the first time ever.

Conditions on the breeding grounds are likely to be important in determining the population's breeding success, in particular, weather conditions during the short Arctic breeding season (Poorter 1991). However, temperatures in the Perchora Delta (in the vicinity of an important breeding area for the species) in May 2019 averaged 2.4˚C which was higher than the previous five-year average for the area (1.1˚C) (TuTiempo 2019). Therefore, other factors such as predator (Arctic fox) abundance may have been influential (Wood *et al*. 2016). Inter-annual variability in breeding success is sensitive to the combined effects of both intrinsic and extrinsic factors (Wood *et al*. 2016).

4. Acknowledgements

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5. References

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Goose & Swan Monitoring