WWT/JNCC/NatureScot Goose & Swan Monitoring Programme survey results 2020/21

East Canadian High Arctic Light-bellied Brent Goose *Branta bernicla hrota*

Interim results for 2018 - 2020

The annual census of the East Atlantic High Arctic Light-bellied Goose population is organised by the Irish Brent Goose Research Group. Counts are undertaken in Iceland, Ireland, Britain and France.

This report presents the interim results in advance of official figures from the 2018–2020 censuses being compiled. The estimates of population size and breeding success for 2018–2020 presented below are derived from Strangford Lough counts only and are depicted graphically both as a proportion of the census totals for 1996–2017, as well as being used to predict population totals for 2018–2020.

1. Abundance

Numbers of Light-bellied Geese wintering at Strangford lough have contributed between 55% and 83% (average 71.5% ± 1.55 SE) of the total count of the East Canadian High Arctic population since flyway counts began in 1996. Furthermore, weekly counts at Strangford Lough during 1996–2014 showed that in most years there was a lagged peak within a month of the census, with the total count at the site contributing up to 94% (average 79.7% ± 1.8 %) of the census total, as more geese continue to arrive and prior to further dispersal of the birds southwards.

As Strangford Lough numbers have such a bearing on the overall census totals they are used here – tentatively – to estimate population levels (see Figure 1). Although a simple linear model demonstrates that the Strangford Lough and census totals are highly correlated ($R^2 = 0.87$), the 95% prediction intervals are still relatively wide at ± 20%. Nevertheless, and until overall flyway figures can be compiled, the population estimates (extrapolated from the Strangford Lough counts) indicate continued stability over the last three years with five-year running means consistent at between 35,000 and 36,000: the extrapolated estimates being *c.* 37,000 for 2018, *c.* 30,000 for 2019 and *c.* 37,500 for 2020.

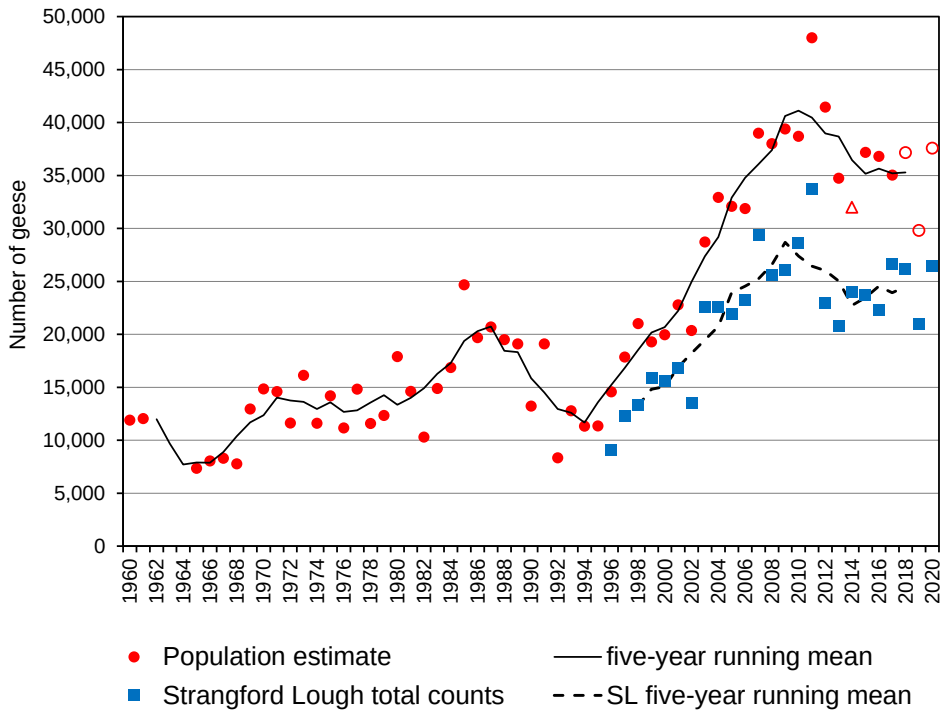

*Figure 1. Annual census-derived estimates of the Canadian Light-bellied Brent Goose population size, 1961–2020 (solid circles; the predicted estimates using an extrapolation of the data from Strangford Loch are shown as open circles, and the open triangle represents a likely undercount in 2014 due to a lack of coverage in Iceland) and the total counts from Strangford Lough, 1996–2020 (solid squares). The five-year running means for the annual census-derived estimates (solid line) and the total counts from Strangford Lough (hashed line) are also presented (*e.g. *the mean for 2018 is for 2016–2020).*

2. Breeding success

Samples of *c.* 10,000 Light-bellied Brent Geese were aged annually on Strangford Lough between 2018 and 2020 and the results show a continuation of the "boom and bust" years of recruitment, with 1.7%, 23.5% and 6.4% young recorded among flocks, respectively (Figure 2). A successful breeding year in 2019 has helped stabilise a downward trend in productivity from a peak ten-year running mean of 14% young in 2008 to a current mean of 8% young.

Brood size samples were predictably low in 2018 with mean of 2.1 ± 0.19 SE young per successful pair (for the 36 broods assessed), followed by 3.3 ± 0.10 SE in 2019 (204 broods) and 2.4 ± 0.12 SE in 2020 (140 broods). The breeding success in 2019 marked the end to a 40-year low in the ten-year mean which had dropped steadily from 2.95 (± 0.16 SE) in 2007/2008 to 2.25 (± 0.21 SE) by 2018.

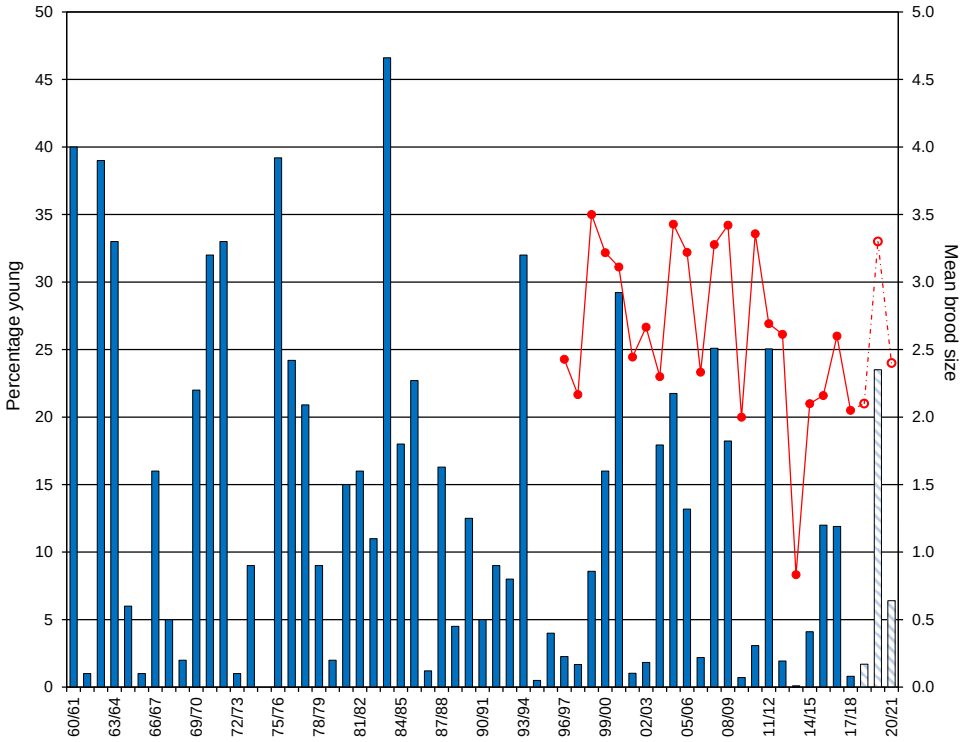

Figure 2. The percentage of young (solid column = census, hashed column = Strangford Lough only) and mean brood size (red solid circles = census, open circles = Strangford Lough only) of East Canadian High Arctic Light-bellied Brent Geese, 1960/61–2020/21.

3. Discussion

Following an all-time peak in 2011, the East Canadian High Arctic population of Light-bellied Brent Goose has still retained the gains made over the previous two decades and remains at a level equivalent to that believed to predate the eelgrass (*Zostra*), previously the primary food for the geese, depletion of the early 1930s. The reason for a lower than expected Strangford Lough goose tally in 2019 (and thus a notable drop in the extrapolated population estimate) considering the high level of recruitment that year, may be clarified at a later date when the rest of the flyway data have been compiled.

The frequency of successful breeding years remains a key dynamic to population resilience with annual censusing, robust productivity estimates and the continuation of a long-term ring resightings program all providing invaluable flyway-level insights. Climatic conditions are highly variable across the population's breeding range allowing some pockets of successful breeders to return with young even during poor years. However, as can be seen in the productivity chart above (Figure 2), there are regular years when very few young returned at all, either having been lost through regional weather events or through late springs and widespread ice preventing the onset of laying or incubation.

Research continues to probe into migration dynamics and into the "cost prohibitive" arctic breeding grounds, using remote sensing and telemetry, while endeavouring to provide conservation direction on staging areas and more recently, the mid-winter urban haunts of down-town Dublin.

4. Acknowledgements

Many thanks to the Irish Brent Goose Research Group for providing this report.

This report should be cited as:

WWT. 2021. *Goose & Swan Monitoring Programme: survey results 2020/21 East Canadian High Arctic Light-bellied Brent Goose* Branta bernicla hrota*.* WWT/JNCC/NatureScot, Slimbridge.

This report was produced under the Goose & Swan Monitoring Programme (GSMP). This programme monitors numbers and breeding success of geese and swans in the UK during the non-breeding season. GSMP is organised by the Wildfowl & Wetlands Trust in partnership with the Joint Nature Conservation Committee and NatureScot.

Goose & Swan Monitoring