



**The Breeding Success of Dark-bellied
Brent Geese in 2003, as assessed in
the UK**

WWT Research Report

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Contents

1	Introduction	1
2	Methods	1
3	Results	2
4	Discussion	6
5	Acknowledgements	7
6	References	8

Summary

A total of 78,044 Dark-bellied Brent Geese *Branta bernicla bernicla* was aged at 15 estuaries and coastal areas in Great Britain between October 2003 and April 2004. The overall proportion of juvenile birds present was 10.0%, varying between 12.8% in October and 0% in April. The mean brood size per successful pair was 2.15 young.

1 Introduction

Great Britain has long been a major wintering area for Dark-bellied Brent Geese. The UK Government has a special responsibility to safeguard this population under various international directives, agreements and conventions (Stroud *et al.* 1990): it is listed on category B2b of the African-Eurasian Waterbird Agreement, Appendix II/2 of the EU Birds Directive and Appendix III of the Bern Convention. As part of ongoing surveillance in the UK, information is gathered on the abundance and distribution of Dark-bellied Brent Geese wintering in Britain (e.g. Pollitt *et al.* 2003) and the breeding success (age ratios) (e.g. Worden & Hearn 2003), through which estimates of annual recruitment can be made.

2 Methods

For the nineteenth consecutive winter, experienced voluntary observers assessed the breeding performance of Dark-bellied Brent Geese. Young Brent Geese (those in their first-winter) have obvious white edging to the wing coverts, which the adults lack. Using a telescope in good light conditions, ageing is feasible at distances of up to 400 m. To determine brood size, distinct groups composed of two adults and one or more juveniles that could be recognised by behaviour or spatial separation from other geese, were regarded as a family. Sample sizes were variable and determined by flock size and field conditions. Data were collected between 9 October 2003 and 1 April 2004. Observers were asked to note the location, date, time and habitat for all observations and the size of flocks, number aged, total number of young and brood sizes, although not all information was provided for all samples.

Counters were encouraged to check flocks whenever possible and no emphasis was placed on obtaining a co-ordinated census that avoided double-counting. Therefore, counts conducted at the same estuaries on different dates will have undoubtedly recorded some birds more than once.

3 Results

Brent Geese were aged at a total of 103 localities within 15 estuaries or coastal areas on the English east and south coasts from north Lincolnshire to Devon (Figure 1, Table 2). Of 314 flocks assessed, 17.5% were in October, the majority in November and December (26.1% and 28.9%, respectively), 12.3% in January, 11.0% in February, 4.3% in March and less than 1% in April. A total of 78,044 geese was aged (only 64.1% of the number aged during 2002/03, and 78.4% of the 5-year mean). The largest numbers were aged at Langstone Harbour (25,231), Chichester Harbour (14,515), The Wash (11,483) and the Blackwater Estuary (6,003). Sample sizes at all other estuaries and coastal sites were smaller than 5,000 birds. The overall proportion of young birds was 10.0% and, of 1,857 broods recorded, the mean brood size was 2.15 young per successful pair.

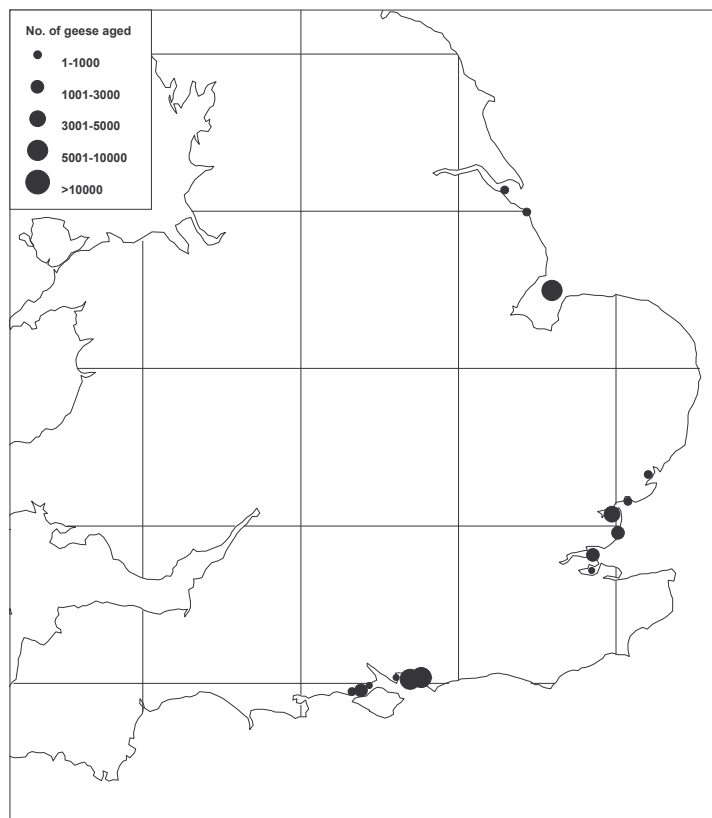
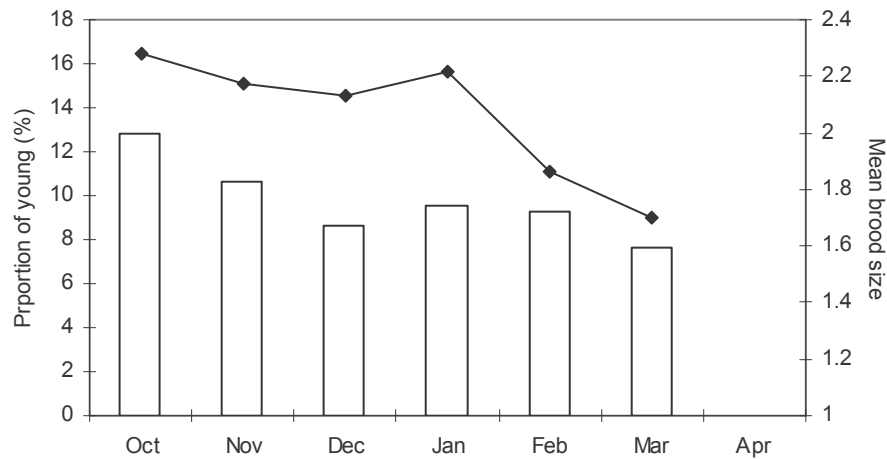


Figure 1. Sites at which Dark-bellied Brent Geese were aged during winter 2003/04

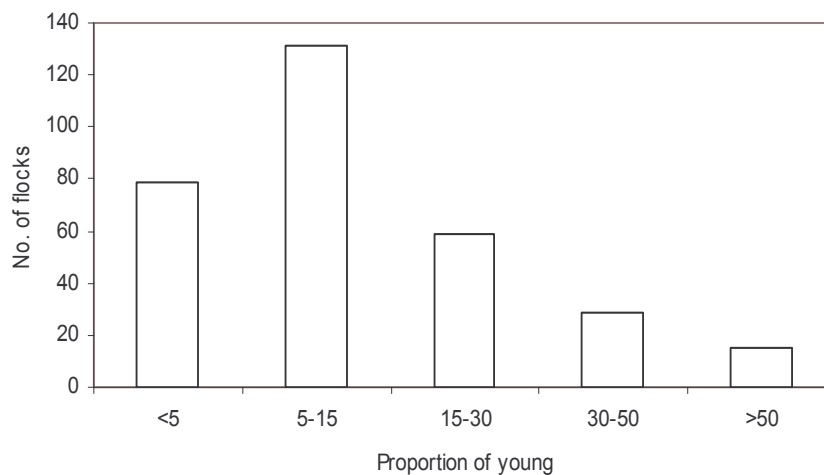
The average proportion of young present in flocks was highest in October (12.8%), decreasing throughout November and December to 8.6%. This increased slightly during January (to 9.5%) before decreasing to 7.6% in March and 0% in April, although very few birds were aged during this last month (Table 1, Figure 2). Mean brood size of successful pairs decreased throughout the winter period with the exception of January when the mean increased to 2.21.

Table 1. The proportion of young and mean brood size of Dark-bellied Brent Geese in different months during winter 2003/04.

Month	Proportion of young (%)		Mean brood size		
	overall	n	mean	s.e.	n
Oct	12.78	13,626	2.28	0.06	468
Nov	10.66	20,351	2.18	0.05	628
Dec	8.60	22,586	2.13	0.06	387
Jan	9.52	9,550	2.21	0.11	108
Feb	9.30	8,566	1.86	0.07	199
Mar	7.61	3,363	1.70	0.12	67
Apr	0	2	-	-	0
Overall	10.02	78,044	2.15	0.03	1,857

**Figure 2.** The proportion of young (bars) and mean brood size (dots) of Dark-bellied Brent Geese in different months during winter 2003/04.

The proportion of young within individual flocks varied greatly (Figure 3), from 0% to 76.5%. Most flocks (41.9%, n=131) contained between 5-15% young, while 25.2% of flocks contained less than 5% young (n=79, of which 28 contained no young at all). As the proportion of young increased above 15%, the number of flocks within each category decreased.

**Figure 3.** The frequency of the proportion of young in individual flocks during winter 2003/04.

The smallest flocks (those with fewer than 100 birds) contained the highest proportion of young (17.0%). The proportion of young in larger flocks did not vary greatly, although flocks of 500-999 birds supported the lowest proportion of young (8.1%, Figure 4). The mean brood size was largest in flocks of more than 2,000 birds and decreased as flock size decreased, with the exception of flocks with less than 100 birds, which held greater than average sized broods.

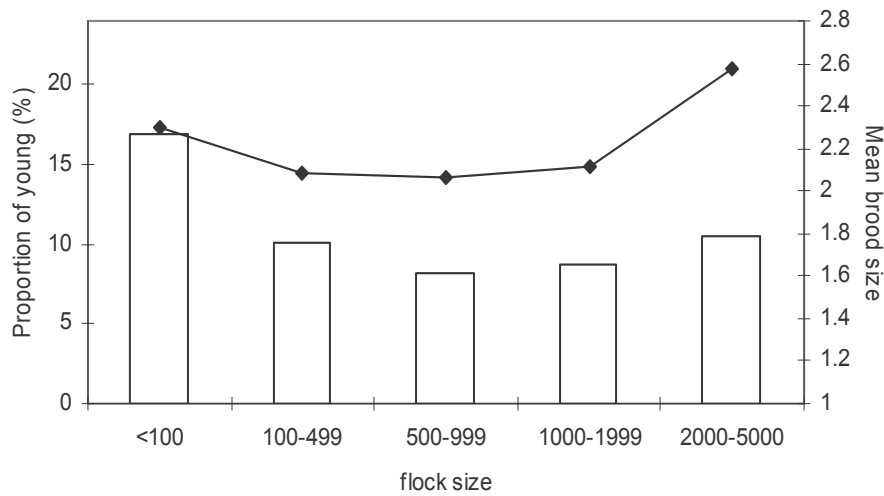


Figure 4. The proportion of young (bars) and mean brood size (dots) recorded in flocks of different size during winter 2003/04.

Geese were recorded in five main habitat types: water, intertidal (including *Zostera* beds), saltmarsh, grass/pasture and cereal fields, including stubble and oilseed rape (Figure 5).

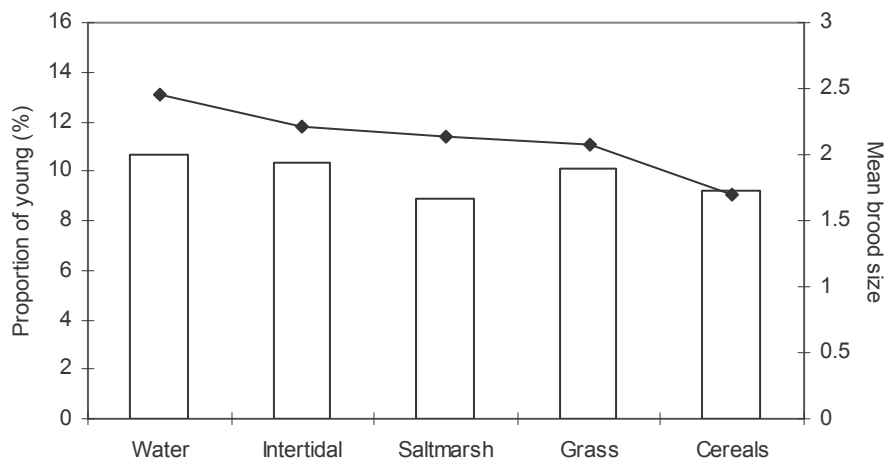


Figure 5. The proportion of young (bars) and mean brood size (dots) recorded in different habitat groups during winter 2003/04.

A combined total of 41.0% of birds was aged in the first three categories, which together represent all intertidal habitats, while a further 50.2% were aged in grass fields and 8.8% in cereal fields. The proportion of young was greatest in those flocks found on water, followed by those foraging on intertidal and grass, although differences were slight. Mean brood size was greatest in flocks found on water, followed by those on intertidal and saltmarsh. It was lowest in those flocks aged in cereal fields, however, the number of broods assessed in this habitat category was relatively low (n=33).

Table 2. Numbers of Dark-bellied Brent Geese aged at British estuaries and coastal areas in winter 2003/04 and the distribution of flocks across habitats.

Estuary	Sample flocks		No. sites	Total aged	% Young	Mean brood size	Percentage distribution across habitats of aged samples						
	First	Last					n	Water	Intertidal	Marsh	Grass	Cereal	
Beaulieu	09 Nov	09 Nov	1	40	[27.50]	2.75	100						
Blackwater	19 Oct	16 Mar	12	6,003	9.83	2.51		5.95			80.73	13.33	
Chichester Harbour	15 Oct	11 Mar	43	14,515	11.51	1.87	22.61	13.58	5.98		53.20	4.63	
Colne	26 Feb	26 Feb	1	1,150	10.43	-					100		
Crouch	09 Dec	09 Dec	2	3,300	6.03	-					100		
Humber	20 Oct	27 Mar	14	2,627	8.60	2.07		53.33			29.65	17.02	
Langstone Harbour	16 Oct	01 Apr	132	25,231	9.24	2.20	3.35	29.39			67.26		
Lymington	09 Oct	15 Mar	20	1,767	11.54	3.16	19.07	16.07			64.86		
Medway	13 Nov	13 Nov	1	720	10.00	-			100				
N Lincolnshire Coast	10 Oct	29 Dec	6	1,772	6.55	-		12.53	26.86				60.61
Portsmouth Harbour	10 Nov	30 Nov	4	602	28.07	2.60					100		
Stour	04 Nov	19 Dec	12	1,356	9.37	2.15	21.24	24.48	16.67				37.61
Thames	16 Oct	31 Oct	4	4,000	12.53	2.61		100					
The Solent	13 Oct	03 Mar	36	3,478	17.83	2.23	24.01	29.76	0.49		45.75		
The Wash	19 Oct	31 Dec	26	11,483	7.49	2.55	8.41	3.02	49.96		9.13	29.48	
Totals	9 Oct	1 Apr	314	78,044	10.02	2.15	8.45	22.25	10.31		50.17		8.83

Note:
Percentage young in square brackets are based on small sample sizes (fewer than 500 birds aged)

4 Discussion

The proportion of young and mean brood size recorded in flocks of Dark-bellied Brent Geese in the UK since 1992 is shown in Figure 6. The breeding success of Dark-bellied Brent Geese is strongly influenced by complex interactions between lemming abundance, predator pressure, and other factors such as weather. In the past, this has followed a three year cycle of good, poor and variable success (Dhondt 1987) and on this basis it was expected that breeding success in 2003 would be poor due to a predicted collapse of the lemming population. Indeed, lemming abundance on the Taimyr Peninsula was low in 2003, and in the Medusa Bay area nest predation by foxes was recorded as high (Soloviev & Tomkovich 2004). The proportion of young Dark-bellied Brent Geese recorded in winter 2003/04 was, however, moderate and is in fact the highest recorded breeding success in a predicted poor year since 1992. Furthermore, it was higher than the previous winter (6.8%) which was a predicted good year.

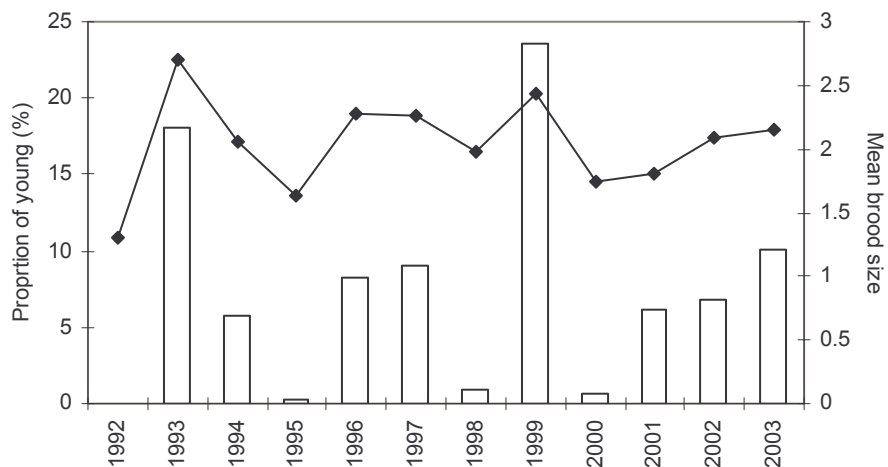


Figure 6. The proportion of young (bars) and mean brood size (dots) of Dark-bellied Brent Geese recorded in Britain, 1992/93-2003/04.

5 Acknowledgements

These observations were organised as part of WWT's long-term Goose Monitoring Programme, with financial support from the WWT/Joint Nature Conservation Committee partnership. We are grateful to JNCC for this support, and to Peter Cranswick for comments on an earlier version of this report.

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