

**The breeding success of Dark-bellied
Brent Geese *Branta bernicla bernicla*
in 2005, as assessed in the UK**

Wildfowl & Wetlands Trust Report

Colette Hall

August 2006



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Goose & Swan Monitoring

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Summary

A total of 77,949 Dark-bellied Brent Geese *Branta bernicla bernicla* was aged at 20 estuaries and coastal areas in Great Britain between October 2005 and April 2006. The overall proportion of juvenile birds present was 28.4%, varying between 27.0% in October to 32.3% in April. Of the 1,284 broods recorded, the mean brood size per successful pair was 2.76 young. The proportion of young was more than 16% higher than in 2004 (11.9%) and the highest since 1991 (31.1%).

1 Introduction

Great Britain has long been a major wintering area for Dark-bellied Brent Geese *Branta bernicla bernicla*. 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 abundance and distribution of Dark-bellied Brent Geese wintering in Britain (eg Collier *et al* 2005) and breeding success (age ratios) (eg Worden 2005), through which estimates of annual recruitment can be made.

2 Methods

For the twenty-first 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. Data were collected between 4 October 2005 and 13 April 2006. 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. Sample sizes were variable and determined by flock size and field conditions.

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. In a few cases, it was necessary to exclude data from the final calculations in an attempt to reduce the likelihood of any replication, although this only occurred where the possibility of replicating counts was obvious.

3 Results

Brent Geese were aged at a total of 133 localities within 20 estuaries or coastal areas on the English east and south coasts from Northumberland to Devon (Figure 1, Table 1).

Of the 332 flocks assessed, 18.7% were in October, the majority were in November and December (24.7% and 25.6%, respectively) decreasing to 13.6% in January through to 2.4% in April. A total of 77,949 geese was aged (an increase of 13.9% on the number aged during 2004/05, and 80.6% of the previous five-year mean). The largest numbers were aged at Langstone Harbour (16,240), North Norfolk (14,117) and Blackwater Estuary (10,798), and between 5,000 and 7,200 individuals were aged at Chichester Harbour, the North Lincolnshire Coast, Crouch Estuary and Thames Estuary. Sample sizes at all other coastal areas were smaller than 5,000 birds. The overall proportion of young birds was 28.4% and, of the 1,284 broods recorded, the mean brood size was 2.76 young per successful pair.

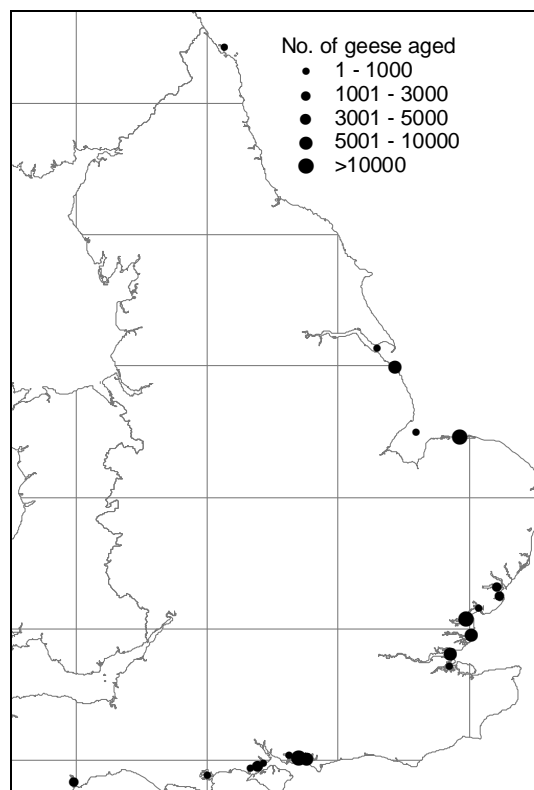


Figure 1. Sites at which Dark-bellied Brent Geese were aged during winter 2005/06.

The average percentage of young present in flocks remained high throughout the winter. It increased throughout October to December (27.0-29.4%), decreasing slightly in January (27.8%), before rising to a peak of 32.3% in April, although the sample size was small in this month (Table 2, Figure 2). Mean brood size of successful pairs varied little during this time, but declined slightly in March (2.48) following a peak of 3.06 in February.

Table 1. Numbers of Dark-bellied Brent Geese aged at British estuaries and coastal areas in winter 2005/06 and the distribution of flocks across habitats.

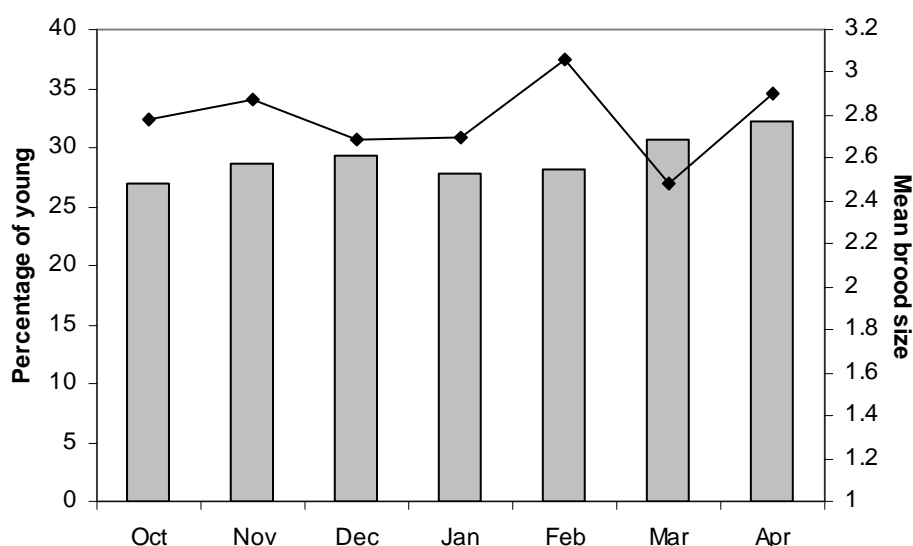
Estuary	Sample flocks			No. sites	Total aged	% young	Mean brood size	Percentage distribution across habitats of aged samples				
	First	Last	n					Water	Intertidal	Marsh	Grass	Cereal
Beaulieu Estuary	05 Nov	26 Feb	4	2	575	24.70	2.80	80			20	
Blackwater Estuary	16 Oct	01 Mar	34	16	10,798	23.84	3.04		3.27	4.22	73.24	19.27
Chichester Harbour	16 Oct	04 Jan	40	19	7,196	30.09	2.95	25.10	9.95		58.14	6.81
Colne Estuary	20 Oct	23 Feb	6	4	873	29.67	2.61			28.18	29.55	42.27
Crouch Estuary	21 Oct	09 Mar	14	5	6,014	30.30	3.45	4.92			78.38	16.7
Exe Estuary	29 Nov	29 Nov	2	2	1,160	20.95					100	
Hamford Water	20 Oct	19 Dec	5	3	1,058	45.84	3.56	6.33				93.67
Humber Estuary	20 Dec	20 Dec	1	1	49	[46.94]			100			
Langstone Harbour	04 Oct	01 Mar	81	23	16,240	27.31	2.56	24.06	17.20	0.76	53.79	4.19
Lindisfarne	06 Dec	06 Dec	1	1	78	[38.46]	2.73				100	
Lymington	07 Nov	04 Feb	7	5	917	38.71	5.00			5.67	94.33	
Medway Estuary	23 Nov	23 Nov	1	1	134	[59.70]						
North Lincs Coast	22 Oct	27 Feb	15	5	7,177	25.46	3.00			13.46		86.54
North Norfolk	18 Oct	13 Apr	59	20	14,117	31.08	3.06	19.84	3.95	7.22	33.98	35.01
Poole Harbour	16 Dec	16 Dec	1	1	35	[22.86]			100			
Portsmouth Harbour	15 Nov	15 Nov	1	1	348	[32.18]					100	
Stour Estuary	26 Oct	27 Feb	23	16	1,506	19.52	2.16	22.05	48.80	5.91		23.24
Thames Estuary	19 Oct	24 Oct	4	1	5,200	26.85	2.94		100			
The Solent	04 Oct	18 Mar	32	6	4,447	34.11	3.00	2.16	11.24		59.05	27.55
The Wash	04 Nov	04 Nov	1	1	27	[40.74]				100		
Totals	04-Oct	13-Apr	332	133	77,949	28.44	2.76	12.53	14.05	3.83	45.98	23.61

Note:

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

Table 2. The proportion of young and mean brood size of Dark-bellied Brent Geese in the UK during winter 2005/06.

Month	Proportion of young (%)		Mean brood size		
	overall	n	mean	s.e.	n
Oct	27.01	13,800	2.78	0.07	328
Nov	28.57	17,070	2.87	0.08	327
Dec	29.38	19,626	2.69	0.08	343
Jan	27.75	12,941	2.70	0.10	196
Feb	28.20	10,364	3.06	0.20	32
Mar	30.71	3,742	2.48	0.17	48
Apr	32.27	406	2.90	0.23	10
Grand Total	28.44	77,949	2.76	0.04	1,284

**Figure 2.** The percentage of young (bars) and mean brood size (diamonds) of Dark-bellied Brent Geese in the UK during winter 2005/06.

The percentage of young within individual flocks varied greatly (Figure 3), from 0% to 84.6% (not including a reported 'flock' of one juvenile). Over three-quarters of flocks assessed held either 15-30% or 30-50% young, each class representing 38.6% (n=128) of the overall total. In contrast to previous years, considerably fewer flocks fell in the lower categories, reflecting the high overall percentage of young recorded; only 24 (7.2%) and 15 (4.5%) flocks contained 5-15% and less than 5% juveniles, respectively, with seven of these holding no young at all.

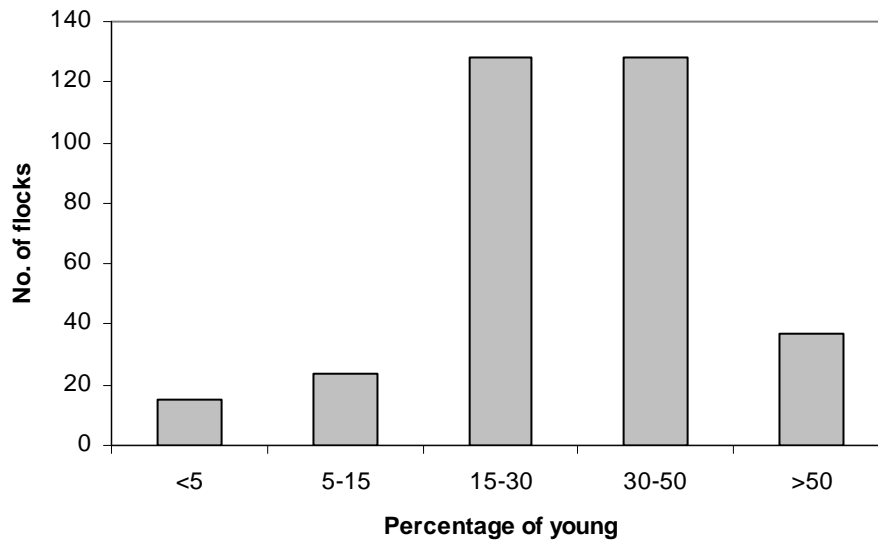


Figure 3. Frequency distribution of the percentage of young in individual flocks (n=332) of Dark-bellied Brent Geese in the UK during winter 2005/06.

As in previous years, the smallest flocks (those with fewer than 100 birds) contained the highest percentage of young (32.9%) (Figure 4). Larger flocks held between 25.8% and 29.8% young, with the lowest observed in flocks of 1,000-1,999 birds, although the percentage of juveniles was fairly consistent across flock size. Mean brood size varied between 2.69 and 3.06 young per successful pair, the largest in flocks of 500-999 birds, but differences between averages were small. No brood sizes were recorded in flocks of 1,000-1,999 birds.

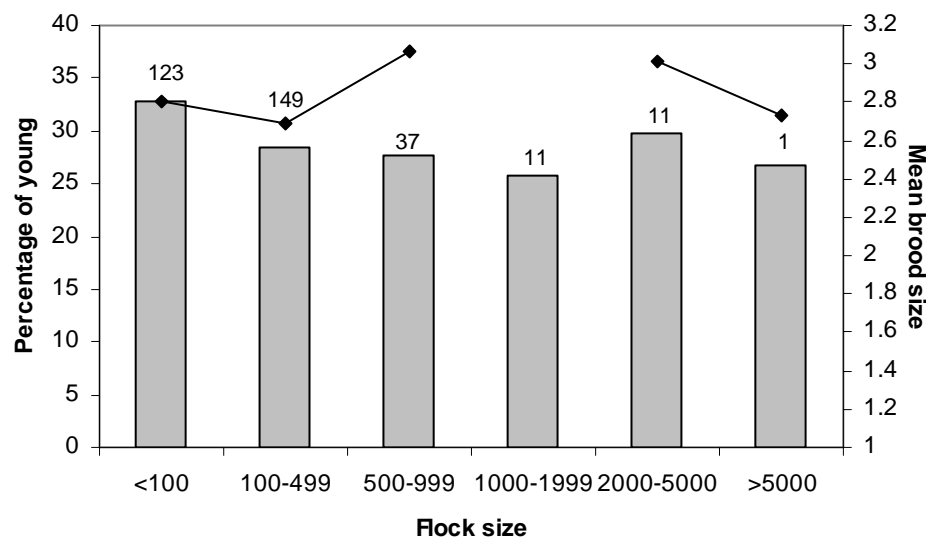


Figure 4. The percentage of young (bars) and mean brood size (diamonds) of Dark-bellied Brent Geese in the UK in flocks of different size during winter 2005/06 (sample sizes are given above bars).

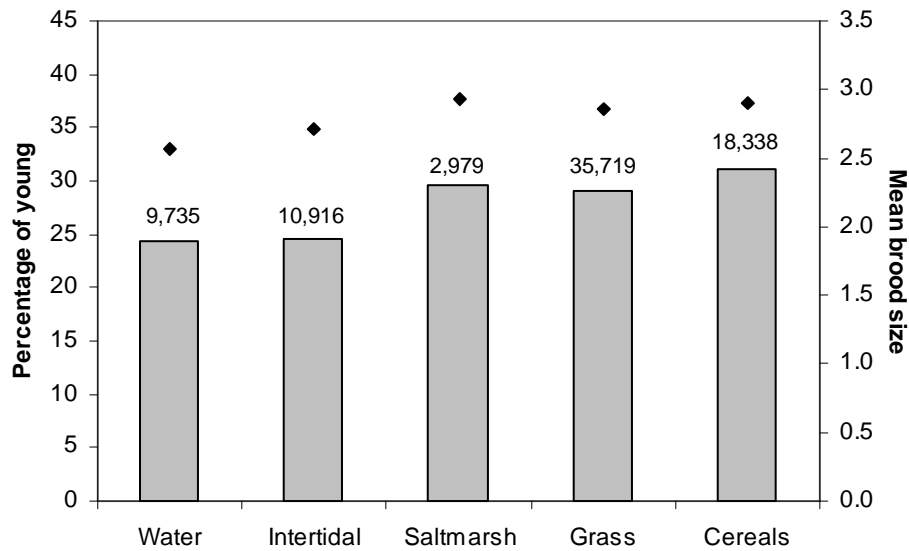


Figure 5. The percentage of young (bars) and mean brood size (diamonds) of Dark-bellied Brent Geese in the UK recorded in different habitat groups during winter 2005/06 (sample sizes are given above bars).

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

The majority of birds (46.0%) were aged in grass fields, while a combined total of 30.4% were aged in the first three categories, which together represent all intertidal habitats. A further 23.6% were aged in cereal fields. Cereal fields supported the highest proportion of young (31.2%), followed by saltmarsh (29.6%) and grass (29.0%). Mean brood size did not vary greatly across habitats; it was greatest in flocks found on saltmarsh (2.93) and lowest in those birds aged on water (2.57), while the highest mean brood sizes occurred in flocks found in the three habitats supporting the highest percentage of juveniles.

4 Discussion

Productivity data received from wintering sites in the UK indicate that 2005 was a particularly successful breeding year for Dark-bellied Brent Geese. Following the poor breeding season in 2002, the proportion of young and mean brood size recorded in flocks of geese in Britain have gradually increased and in 2005 were markedly higher than in the previous five years (Figure 6). Furthermore, this is only the second time in the last 12 years that the percentage of juveniles has exceeded the average mortality rate of 15% (Summers & Underhill 1991).

The breeding success of Dark-bellied Brent Geese has previously been shown to follow a three-year cycle of good, poor and variable success (Dhondt 1987), and is greatly influenced by interactions between lemming abundance, predator pressure and other factors such as weather. Though 2005 was a good year, as was expected according to the cycle, it succeeds a number of years in which productivity figures did not follow this pattern, suggesting the connection between lemming abundance and breeding success may no longer function in the same way.

Reports from monitoring stations in the Arctic indicated that conditions on the breeding grounds in 2005 were favourable. Outposts along the Taimyr, Gydan and Yamal Peninsulas in Russia, noted exceptionally high numbers of lemmings and above average temperatures for the time of year, with spring arriving early in many parts (Soloviev & Tomkovich 2006). Early observations from the Pyasina Delta, on the Taimyr Peninsula, pointed towards 2005 being an extraordinarily good breeding season for Brent, with the possibility that flocks in western Europe may consist of 40% first-winter birds (Ebbinge pers. comm.). Preliminary information also suggests a similar percentage occurred amongst flocks in the Netherlands (Koffijberg pers. comm.).

Poor productivity has resulted in a decline in the population, both nationally and internationally, since the early 1990s (Collier *et al* 2005, Wetlands International 2002) leading to the species being listed as ‘Vulnerable’ according to European Red List criteria (Birdlife International 2004). Consequently, the excellent breeding season in 2005 is very encouraging, but whether there is any positive effect on the general trend will require continued investigation.

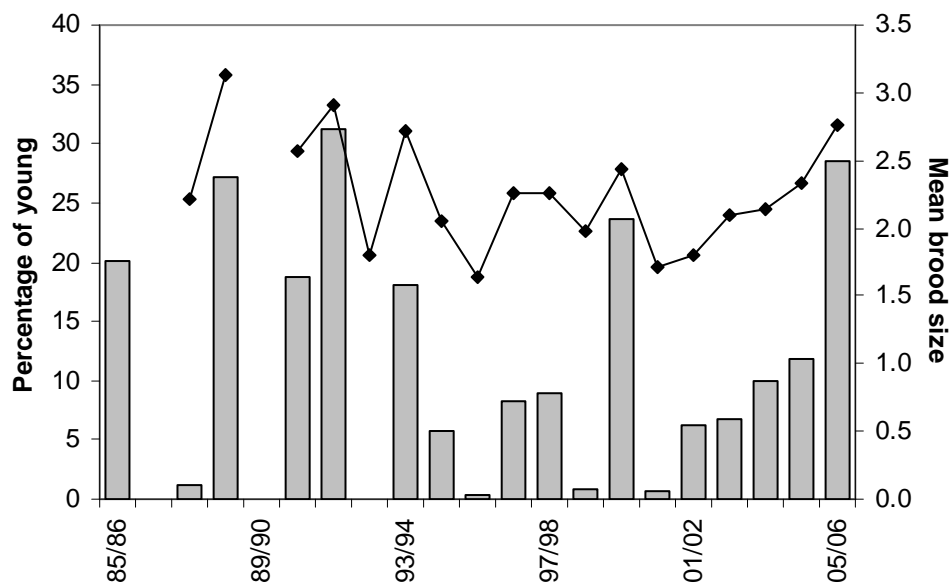


Figure 6. The percentage of young (bars) and mean brood size (diamonds) of Dark-bellied Brent Geese recorded in the UK, 1985/86-2005/06.

5 Acknowledgements

This report was produced under the Goose & Swan Monitoring (GSMP) Programme. This programme of surveys monitors the abundance and productivity of geese and swans in the UK during the non-breeding season. GSMP is organised by the Wildfowl & Wetlands Trust (WWT) on behalf of WWT and the Joint Nature Conservation Committee (JNCC, on behalf of English Nature, Scottish Natural Heritage, Countryside Council for Wales and the Environment and Heritage Service in Northern Ireland). The support of JNCC is gratefully acknowledged. Thanks also to Gareth Bradbury, Lisa Allen and Anne Harrison for helping with the compilation of count data, and to Richard Hearn, Baz Hughes and Helen Baker for comments on an earlier version of this report.

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