

**The breeding success of Dark-bellied
Brent Geese *Branta bernicla bernicla*
in 2004, as assessed in the UK**

Wildfowl & Wetlands Trust Report

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Goose & Swan Monitoring

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Summary

A total of 68,429 Dark-bellied Brent Geese *Branta bernicla bernicla* was aged at 19 estuaries and coastal areas in Great Britain between October 2004 and March 2005. The highest proportion of young was seen in January (13.9%), the lowest in March (6.7%). The overall proportion of juvenile birds present was 11.9% and the mean brood size per successful pair was 2.30 young. The proportion of young was the highest for five years and was 4.7% above the previous ten-year mean.

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 the abundance and distribution of Dark-bellied Brent Geese wintering in Britain (eg Cranswick *et al* 2005) and the breeding success (age ratios) (eg Worden & Hearn 2004), through which estimates of annual recruitment can be made.

2 Methods

For the twentieth 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 5 October 2004 and 12 March 2005. 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.

Results

Brent Geese were aged at a total of 112 localities within 19 estuaries or coastal areas on the English east and south coasts from north Lincolnshire to Devon (Figure 1, Table1). Data were received from all but one site known to hold internationally important numbers of Dark-bellied Brent Geese and eight of 14 nationally important sites (Cranswick *et al* 2005). Important sites for which no data were provided include Pagham Harbour, Southampton Water, Deben Estuary, Newtown Estuary, Fleet/Wey, Beaulieu Estuary and the Burry Inlet.

A total of 68,429 geese was aged (87.7% of the number aged during 2003/04, and 68.8% of the previous five-year mean). The largest numbers were aged at Langstone Harbour (18,997), Blackwater Estuary (11,361), The Wash (5,829), Crouch Estuary (5,816) and Chichester Harbour (5,753). Sample sizes at all other estuaries and coastal sites were smaller than 5,000 birds. Of 279 flocks assessed, 11.5% were in October, 39.0% in November decreasing throughout the winter to 12.2% in February and less than 1% in March. No birds were aged in April or September. The overall proportion of young birds was 11.9% and, of 1,339 broods recorded, the mean brood size was 2.30 young per successful pair.

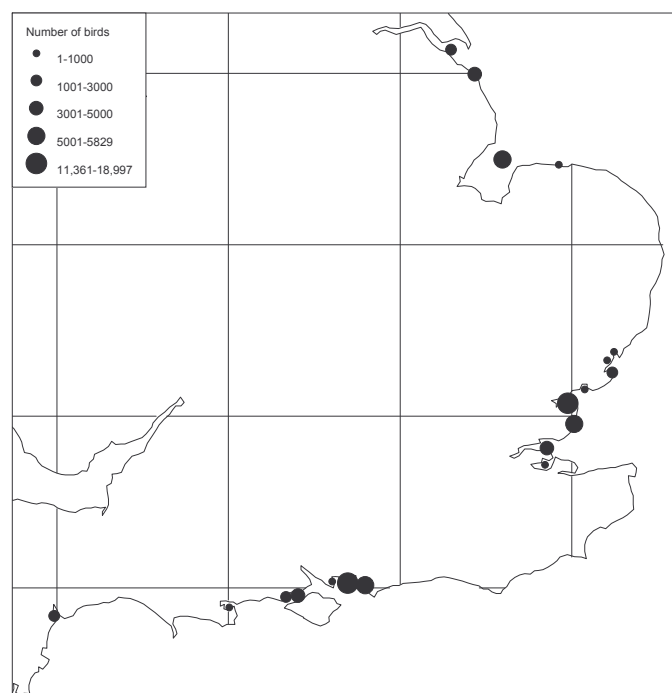


Figure 1. Sites at which Dark-bellied Brent Geese were aged during winter 2004/05.

The average proportion of young present in flocks was high in October and November (11.4% and 12.2% respectively), then dropped in December before reaching a peak in January (13.9%). A relatively high percentage of young was again recorded in February before decreasing substantially in March (6.7%) (Table 2, Figure 2). Mean brood size of successful pairs was highest in October (2.65) and decreased steadily throughout the winter period before rising to 2.17 in February. No brood size data were collected in March.

Table 1. Numbers of Dark-bellied Brent Geese aged at British estuaries and coastal areas in winter 2004/05 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
Blackwater	17 Oct	28 Feb	23	14	11,361	7.99	1.97	0.07	6.8	5.71	86.46	0.95
Chichester Harbour	15 Oct	21 Jan	28	17	5,753	11.39	2.16	35.81	5.18	0	54.56	4.45
Colne	07 Dec	07 Dec	1	1	5	[60]			100			
Crouch	03 Nov	27 Feb	6	1	5,816	14.87					100	
Exe	24 Oct	16 Jan	14	8	1,949	16.83	2.64		60.13		39.87	
Hamford Water	21 Nov	20 Jan	6	2	1,463	21.19	3.57	63.23	3.55			33.22
Humber	22 Oct	17 Feb	10	2	1,749	7.43	2.03		100			
Langstone Harbour	11 Oct	25 Feb	98	24	18,997	12.24	2.19	16.56	25.44		55.37	2.64
Lymington	08 Nov	07 Feb	12	6	1,610	9.44	1.78	5.78	28.63		65.59	
Medway	24 Nov	02 Dec	2	1	400	[6.75]				15		85
N Lincs Coast	16 Oct	12 Mar	17	8	4,204	12.39	1.97		6.97	34.87		58.16
N Norfolk	29 Oct	11 Jan	5	3	311	[21.22]	2.17	22.83		13.5	63.67	
Orwell	16 Oct	16 Oct	1	1	29	[41.38]			100			
Poole Harbour	08 Feb	08 Feb	1	1	40	[20]					100	
Portsmouth Harbour	07 Nov	07 Nov	1	1	98	[51.02]	2.58				100	
Stour	05 Oct	12 Dec	10	8	824	11.65	2	14.2	25.12			60.68
Thames	20 Oct	25 Oct	3	1	3,500	9.86	2.73		100			
The Solent	14 Oct	12 Mar	26	9	4,491	14.43	2.33	20.77	20.06		26.21	32.95
The Wash	11 Oct	08 Jan	15	4	5,829	11.56	2.87			96.13		3.87
Totals	05 Oct	12 Mar	279	112	68,429	11.87	2.30	10.75	20.87	11.38	47.73	9.27

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 during winter 2004/05.

Month	Proportion of young (%)		Mean brood size		
	overall	n	mean	s.e.	n
Oct	11.40	7,883	2.65	0.09	217
Nov	12.23	26,676	2.27	0.04	795
Dec	9.84	14,335	2.19	0.09	189
Jan	13.87	10,876	2.02	0.11	97
Feb	12.21	8,377	2.17	0.17	41
Mar	6.74	282	-	-	0
Apr	-	0	-	-	0
Overall	11.87	68,429	2.30	0.03	1,339

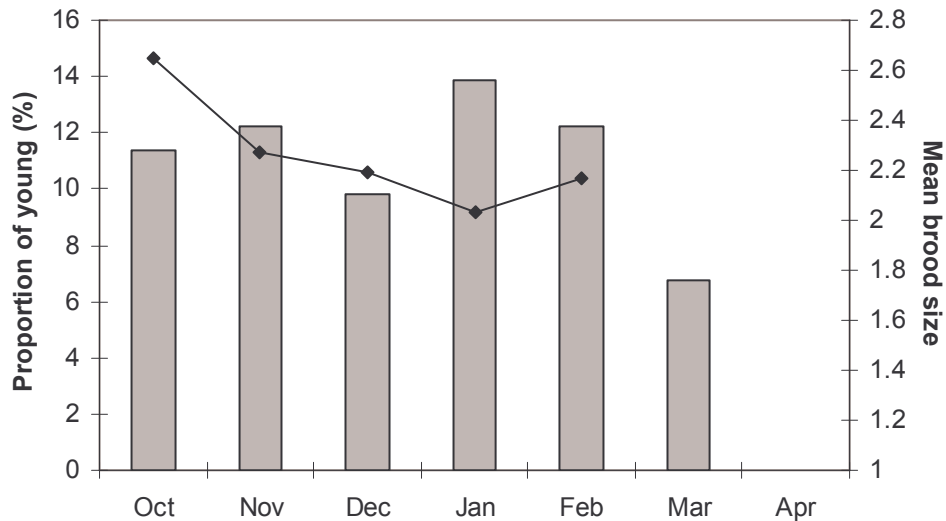


Figure 2. The proportion of young (bars) and mean brood size (dots) of Dark-bellied Brent Geese during winter 2004/05.

The proportion of young within individual flocks varied greatly (Figure 3), from 0% to 76.5%. Most flocks (35.9%, n=103) contained between 5-15% young, while 18.1% of flocks contained less than 5% young (n=52, of which 12 contained no young at all). As the proportion of young increased above 15%, the number of flocks within each category decreased, although the number of flocks holding 15-30% young formed a relatively high proportion of the overall total (29.6%, n=85).

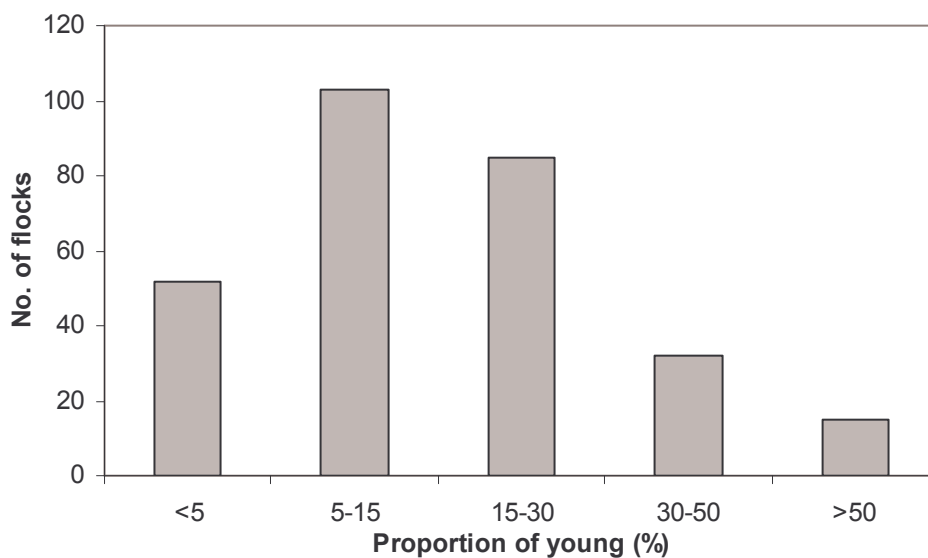


Figure 3. The frequency of the proportion of young in individual flocks during winter 2004/05.

As in previous years, the smallest flocks (those with fewer than 100 birds) contained the highest proportion of young (19.9%). The proportion of young in larger flocks did not vary greatly (11.0-12.6%), although flocks of over 2,000 birds supported the lowest percentage of young (7.6%, Figure 4). The mean brood size was largest in flocks of 500-2,000 birds (2.47-2.74). Flocks of fewer than 500 birds or those of more than 2,000 held similarly sized broods (2.19-2.27).

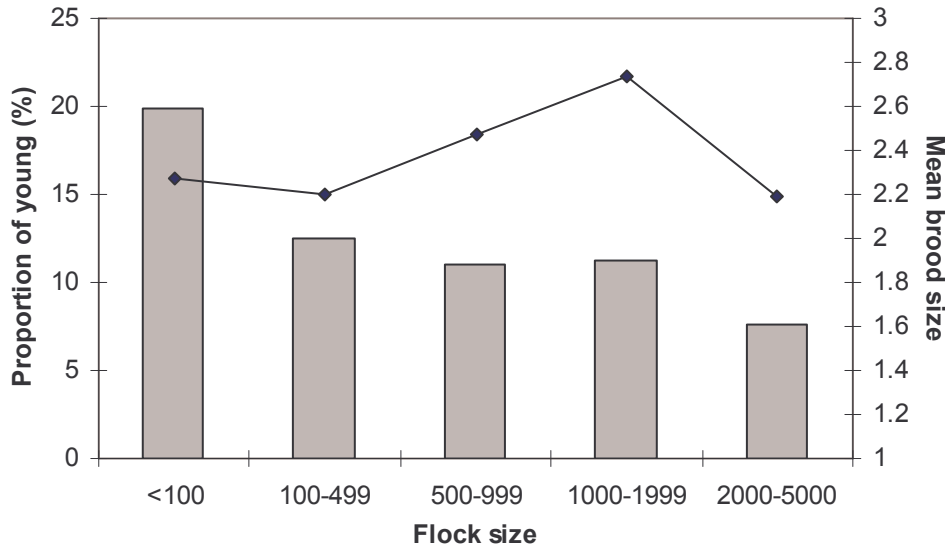


Figure 4. The proportion of young (bars) and mean brood size (dots) recorded in flocks of different size during winter 2004/05.

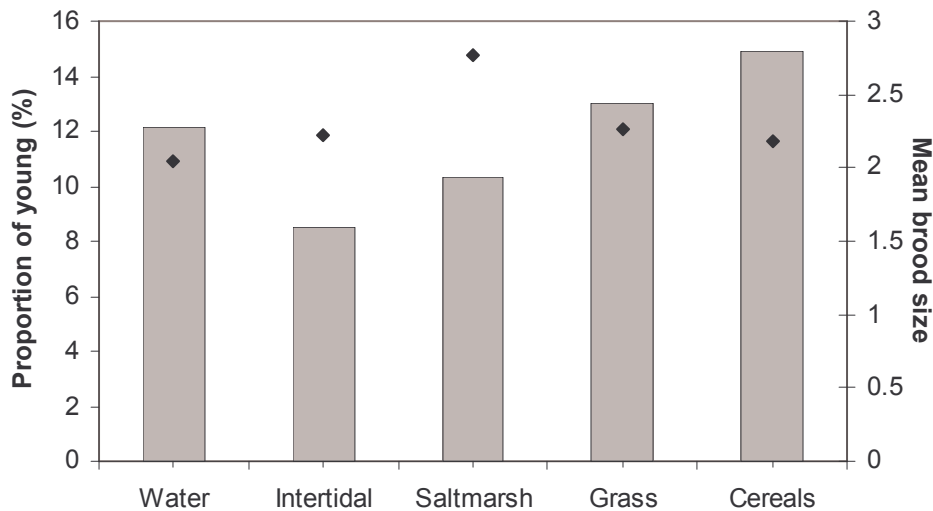


Figure 5. The proportion of young (bars) and mean brood size (dots) recorded in different habitat groups during winter 2004/05.

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 (47.7%) were aged in grass fields while 20.9% were aged on intertidal habitats, 11.4% on saltmarsh, 10.8% on water and a further 9.3% in cereal fields. The proportion of young was greatest in those flocks foraging on cereal fields and grass; habitats that potentially provide nutritionally rich sources of food. Mean brood size was greatest in flocks aged on saltmarsh and lowest in those flocks found on water.

Discussion

Productivity data were received from a large number of sites throughout the wintering range. Coverage was achieved for all but one site holding internationally important numbers. The proportion of young and mean brood size recorded in flocks of Dark-bellied Brent Geese in the UK has increased year on year since an extremely poor breeding season in 2000 (Figure 6). Although the proportion of young is the highest for five years, this is the fifth year that it has remained below the average mortality rate of 15%, and only once in the last ten years has it exceeded this figure. Poor productivity in recent years is reflected in the trend of declining numbers of this population in the UK and internationally since the early 1990s, with abundance in the UK currently at its lowest since the early 1980s (Granswick *et al* 2005, Wetlands International 2002).

Productivity is influenced by a range of factors including weather conditions and predator pressure on the Arctic breeding grounds. Variable conditions were seen across Russia in 2004 (Soloviev & Tomkovich 2005). Spring was late in many areas of Siberia, including the Taimyr Peninsula, and midsummer temperatures were colder than average in parts of Russia, including Taimyr and Yamal Peninsulas.

An interaction between rodent abundance and productivity has previously been recognised with a three year cycle of good, bad and variable success based on the cyclical nature of lemming abundance (Dhondt 1987). Rodent abundance was low in many parts of Russia, including the Taimyr Peninsula, with isolated pockets of high abundance on the Chukotsky and Yamal Peninsulas, Yakutia and east of the Urals (Soloviev & Tomkovich 2005). Bird breeding success in general was unclear in many areas, although thought to be average in the Taimyr Peninsula. The highest recorded number of Brent Goose nests to date occurred at Cape Wostochny on the Taimyr Peninsula. Although it was expected that breeding success in 2004 would be variable following a predicted crash in the lemming population in the preceding year, productivity was higher than expected. Productivity figures, certainly for the last three years, do not correlate with the proposed three year cycle of lemming abundance. Although predator-prey interactions undoubtedly influence productivity, these data suggest that lemming abundance cycles are no longer operating in the same way.

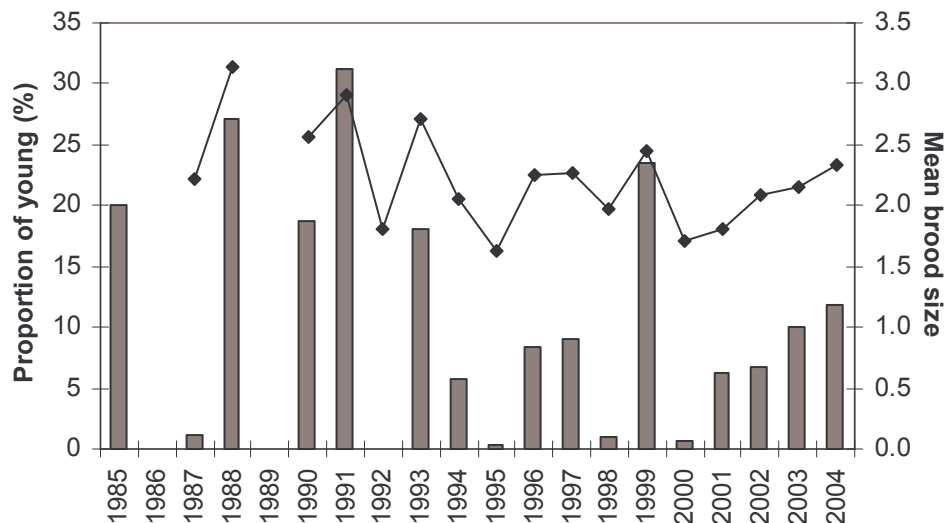


Figure 6. The proportion of young (bars) and mean brood size (dots) of Dark-bellied Brent Geese recorded in Britain, 1985/86-2004/05.

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