

**The breeding success of  
Dark-bellied Brent Geese in 2002,  
as assessed in the UK**

**A Wildfowl & Wetlands Trust Report**

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Jenny Worden & Richard Hearn

The Wildfowl & Wetlands Trust  
Slimbridge  
Gloucestershire  
GL2 7BT

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## SUMMARY

A total of 121,845 Dark-bellied Brent Geese *Branta bernicla bernicla* was aged at 21 estuaries and coastal areas in Great Britain between September 2002 and March 2003. The overall proportion of juvenile birds present was 6.8%, varying between 0% in September and 13.3% in March. The mean brood size per successful pair was 2.09 young.

## 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. Musgrove *et al.* 2001) and the breeding success (age ratios) (e.g. Hearn 2002), through which estimates of annual recruitment can be made.

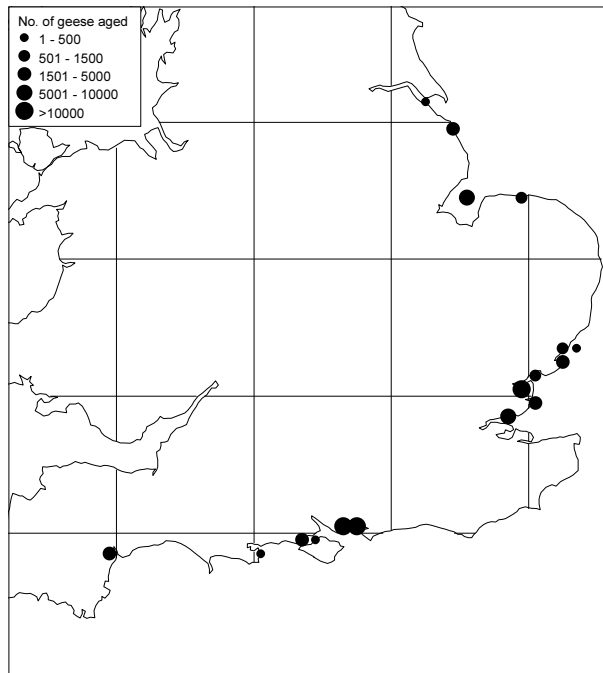
## METHODS

For the eighteenth 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 27 September 2002 and 19 March 2003. 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.

## RESULTS

Brent Geese were aged at a total of 135 localities within 21 estuaries or coastal areas on the English east and south coasts from north Lincolnshire to Devon (Figure 1, Table 2). Of 414 flocks assessed, 0.24% were in September, the majority in October, November and December (28.3%, 23.2% and 22.2%, respectively), 15.7% in January, 7.0% in February and 1.4% in March. Eight counts (1.9%) were not supplied with a date. A total of 121,845 geese was aged (a decrease of 1.5% on the number aged during 2001/02, but a 7% increase on the 5-year mean). The largest numbers were aged at Langstone Harbour (48,642), Chichester Harbour (19,666), the Blackwater Estuary (11,795), The Wash (8,604) and the Thames Estuary (5,048). Sample sizes at all other estuaries and coastal sites were smaller than 5,000 birds. The overall proportion of young birds was 6.8% and, of 2,052 broods recorded, the mean brood size was 2.09 young per successful pair.



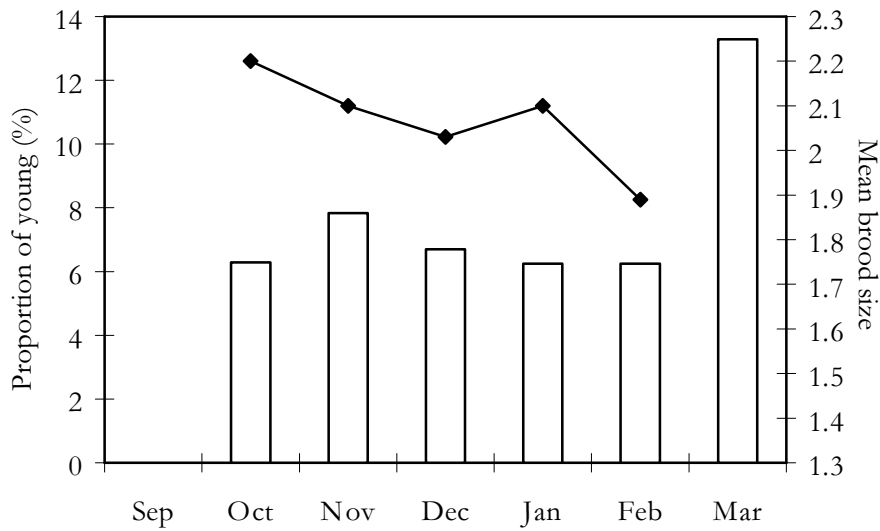
**Figure 1.** Sites at which Dark-bellied Brent Geese were aged during winter 2002/03 (Jersey not shown).

The average proportion of young present in flocks increased throughout the period September to November (0 - 7.8%), before decreasing slightly in December (6.7%), January and February (6.3%). In March, a sharp increase was observed (to 13.3%), but sample size was small in this month (Table 1, Figure 2). During this period, the mean brood size of successful pairs varied little. It peaked at 2.20 in October and was lowest in February. No brood size data were collected during September or March.

**Table 1.** The proportion of young and mean brood size of Dark-bellied Brent Geese in different months during winter 2002/03.

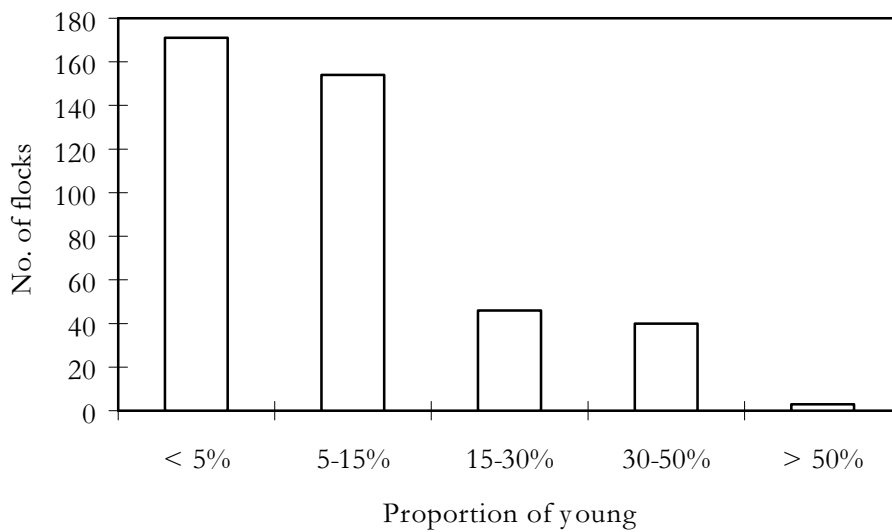
Month	Proportion of young (%)		Mean brood size		
	overall	n	mean	s.e.	n
Sep	0.0	788	-	-	0
Oct	6.3	21,409	2.20	0.06	524
Nov	7.8	29,431	2.10	0.05	638
Dec	6.7	30,480	2.03	0.05	576
Jan	6.3	24,257	2.10	0.07	217
Feb	6.3	13,915	1.89	0.11	97
Mar	13.3	1,512	-	-	0
Overall	6.8	121,792 <sup>1</sup>	2.09	0.03	2,052

<sup>1</sup> The sum from individual months is less than the overall total because dates were not provided for some records.



**Figure 2.** The proportion of young (bars) and mean brood size (dots) of Dark-bellied Brent Geese in different months during winter 2002/03.

The proportion of young within individual flocks varied greatly (Figure 3), from 0% to 66.7%. Most flocks (41%, n=171) contained less than 5% juveniles with 55 of these containing no young at all. Overall, as the proportion of young increased, the number of flocks within each category decreased.



**Figure 3.** The frequency of the proportion of young in individual flocks during winter 2002/03.

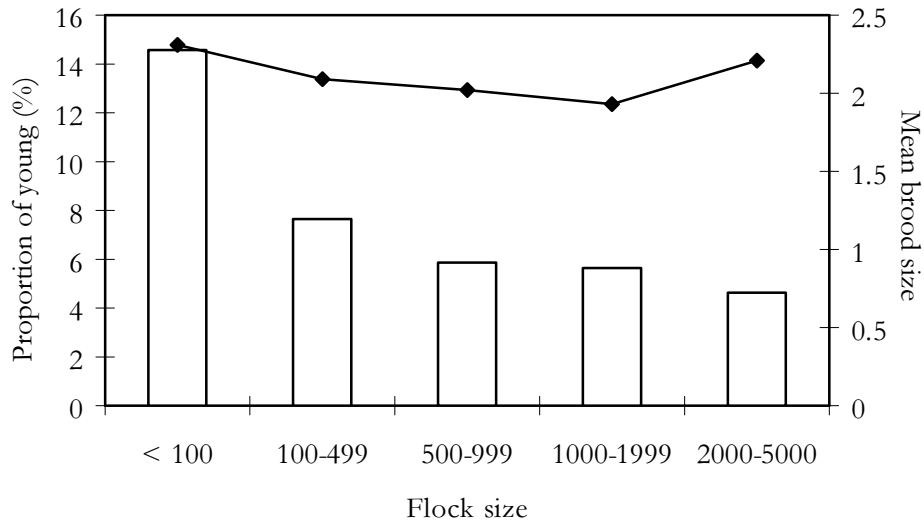
**Table 2.** Numbers of Dark-bellied Brent Geese aged at British estuaries and coastal areas in winter 2002/03 and the distribution of flocks across habitats.

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	23 Oct	23 Oct	1	176	[0]	-	100						
Blackwater	29 Oct	21 Jan	9	11,795	8.8	1.81		2.6			87.2		10.2
Chichester Harbour	3 Oct	28 Jan	24	19,666	4.3	2.16	13.3	3.7	4.1	26.3	64.9		14.0
Colne	19 Oct	24 Feb	5	1,493	6.8	3.0		0.4			73.3		
Crouch	1 Nov	19 Mar	7	3,521	10.7	2.39					90.1		9.9
Deben	3 Mar	3 Mar	1	476	[17.9]	-							100
Exe	19 Nov	5 Mar	8	1,512	10.1	2.33		23.7			76.3		
Hamford Water	11 Nov	10 Mar	7	2,316	24.3	2.55	1.7	12.0	14.8				71.5
Humber	17 Oct	18 Nov	3	152	[11.2]	4.25		82.9	17.1				
Jersey	27 Dec	2 Feb	4	596	10.4	1.85		54.4			45.6		
Langstone Harbour	27 Sep	15 Mar	159	48,642	3.9	2.07	4.4	12.0	0.3		83.3		
Lymington	12 Oct	3 Feb	20	2,861	4.8	2.39	24.8	19.5			55.7		
N. Lincolnshire coast	13 Oct	13 Feb	16	2,819	5.6	1.38	1.0	55.9	27.8				15.3
N. Norfolk coast	6 Oct	3 Dec	6	1,327	5.1	1.97		13.3			86.7		
Poole Harbour	24 Jan	24 Jan	1	230	[15.2]	-					100		
Portsmouth Harbour	10 Nov	20 Feb	26	3,690	13.1	2.25		23.8			76.2		
Roach	20 Feb	20 Feb	2	1,344	12.1	-		18.2	81.8				
Stour	20 Oct	21 Nov	8 <sup>1</sup>	911	11.5	2.71	20.1	44.5	1.4				34.0
Thames	11 Oct	25 Oct	6	5,048	10.4	2.36		100					
The Solent	1 Oct	3 Feb	29	4,666	7.8	2.14	20.1	5.6	11.7		41.2		21.4
The Wash	4 Oct	14 Feb	25	8,604	6.1	2.44	3.9	11.3	35.0		41.0		8.8
Totals	27 Sep	19 Mar	406 <sup>1</sup>	121,845	6.8	2.09	5.9	14.9	5.9		66.0		7.3

Notes:

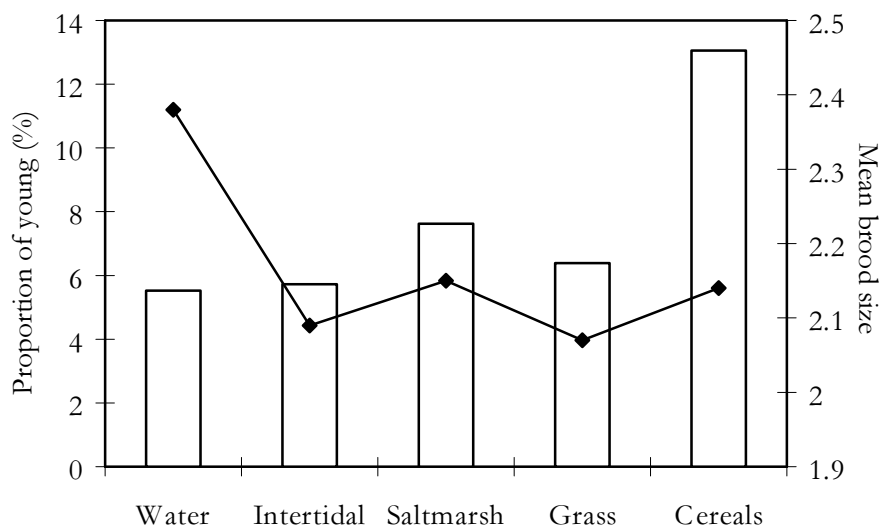
<sup>1</sup> eight counts on the Stour were not supplied with a date  
percentage young in square brackets are based on small sample sizes (fewer than 500 birds aged)

The smallest flocks (those with fewer than 100 birds) contained the highest proportion of young (14.6%). Larger flocks held between 4.6% and 7.7% young, with flocks of more than 2,000 birds supporting the lowest proportion of young (Figure 4). The mean brood size was largest in flocks of fewer than 100 birds and decreased as flock size increased, with the exception of flocks with more than 2,000 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 2002/03.

Geese were recorded in five main habitat types: water, intertidal (including *Zostera* beds), saltmarsh, grass/pasture and cereal fields, including stubble and oilseed rape (a limited number of observations on root crop and root crop tailings have also been included in this category) (Figure 5).

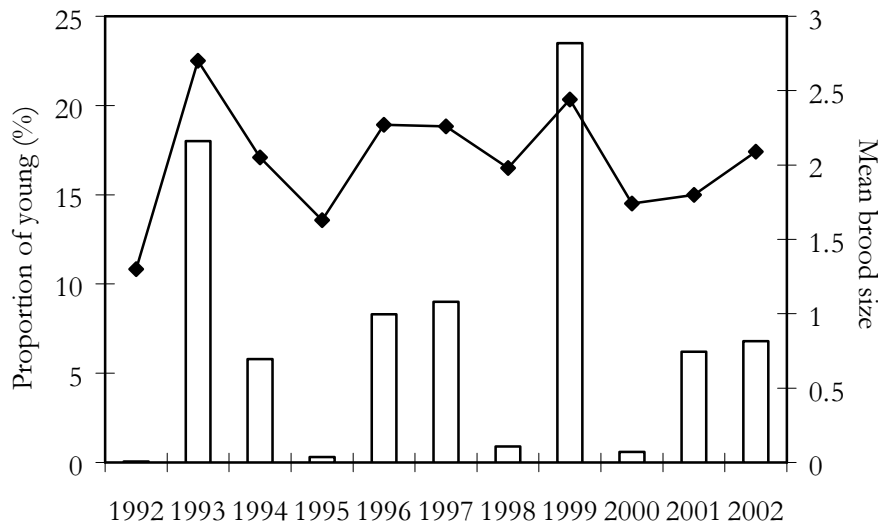


**Figure 5.** The proportion of young (bars) and mean brood size (dots) recorded in different habitat groups during winter 2002/03.

A combined total of 26.7% of birds was aged in the first three categories, which together represent all intertidal habitats, while a further 66.0% were aged in grass fields and 7.3% in cereal fields. The greatest proportion of young was found in flocks foraging on cereals, followed by saltmarsh and grass. Mean brood size was greatest in flocks found on water, followed by those on saltmarsh and cereal fields.

## 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. According to the three-year cycle of good, poor and variable breeding success (Dhondt 1987), 2002 was expected to be a good year, following the year of peak lemming abundance in 1999. The proportion of young recorded in winter 2002/03 (6.8%) was, however, only marginally higher than winter 2001/02 (6.2%), and below that expected of a good breeding year. This is the second of the past four predicted good years in which productivity has been lower than the estimated rate of mortality (15%, Summers & Underhill 1991) and over the past 11 years, productivity has exceeded 15% in only two years (1993 and 1999).



**Figure 6.** The proportion of young (bars) and mean brood size (dots) of Dark-bellied Brent Geese recorded in Britain, 1992-2002.

Despite an unexpectedly low proportion of young for a predicted good year, the findings of this census concur with reports from breeding areas on the Taimyr Peninsula. They indicate that lemming abundance was lower than expected in 2002, with the majority of monitoring stations reporting average/moderate abundance and relatively few young Brent Geese fledging (Soloviev & Tomkovich 2003).

## ACKNOWLEDGEMENTS

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The biggest thank you goes to the volunteer counters who undertook the fieldwork upon which this report is based. Without their hard work and continued interest in this monitoring programme, there would be no report and we would have a poorer understanding of this population. With apologies for any omissions or misspellings, they are:

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