



An assessment of breeding success in the Dark-bellied Brent Goose *Branta b. bernicla* in the UK in 1998

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SUMMARY

A total of 86,627 Dark-bellied Brent Geese was aged at 20 estuaries and other coastal sections in Great Britain between September and December 1998. The overall proportion of juvenile birds present was 0.9%, varying between 0.0% in September and 1.16% in December. Of 376 broods recorded, the mean brood size was 1.98 young per successful pair.

INTRODUCTION AND METHODS

Britain has long been a major wintering area for Dark-bellied Brent Geese *Branta b. bernicla*. The UK Government has a special responsibility to safeguard this species under international legislation (Stroud et al. 1990), and additionally, it is an 'Amber Listed' species in 'Birds of Conservation Concern' (RSPB et al. 1996). Information is gathered not only about the abundance and distribution of Brent Geese wintering in Britain (e.g. Waters et al. 1998) but also on age ratios (e.g. Hearn 1998), through which estimations of the annual recruitment can be made.

For the fourteenth consecutive autumn, the breeding performance of Dark-bellied Brent Geese was assessed by experienced voluntary observers. First-winter Brent Geese 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. Sample sizes are "Variable and determined by flock size and field conditions. 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 22 September and 13 December. 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.

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 96 localities within 20 estuaries or coastal sections from North Lincolnshire to Devon (Figure 1), summarised on a regional basis in Table 1. Of 263 flocks assessed, 2% were in September, the majority in October (32%) and November (49%), and 17% in December. A total of 123,549 geese was counted of which 86,627 were aged (an increase of 0.1 % over the number aged during 1997). These included 800 young, a

Table 1. Numbers of Dark-bellied Brent Geese counted and aged at 20 British estuaries and coastal areas in autumn 1998 and the distribution of flocks across habitats.

Estuary	Counts		No. sites	Total Count	Total aged	% Young	Mean Brood Size	Total count % distribution across habitats					
	First	Last						No.	Water	. Inter tidal	Marsh	Grass	Cereal
Beaulieu	9 Nov	9 Nov	1	79	79	0	-	100					
Blackwater	27 Oct	1 Dee	11	11,162	8,367	0.66	1.67		12.4			65.6	2.2
Chichester Harbour	30 Sep	8 Dee	60	10,459	9,453	0.97	1.53	58.3	16.7	1.1	21.6	2.3	
Caine	26 Oct	12 Nov	2	1,840	1,840	0.05	1				100		
Crouch	9 Nov	1 Dee	4	3,450	3,450	1.3	2.5			7	56.5	36.5	
Exe	10 Oct	13 Dee	8	2,279	2,279	1.27	2	73.3	11.8		14.9		
Hamford Water	18 Oct	2 Dee	3	394	328	(1.22)	2		30.7	69.3			
Humber	1 Nov	1 Nov	1	108	108	(0.93)	1			100			
Jersey	19 Nov	5 Dee	3	206	206	0	-		100				
Langstone Harbour	4 Oct	6 Dee	56	15,997	13,285	1.58	2.29	13	23.1	0.7	63.2		
Lymington	4 Oct	5 Dee	6	1,020	1,020	0.88	1.8	100					
Medway	28 Oct	28 Oct	1	97	97	(4.12)	4						100
North Lines coast	9 Oct	5 Dee	14	3,026	3,026	0.1	1		29.2	70.8			
North Norfolk	26 Oct	22 Nov	7	2,596	2,504	1.04	1.6		5.8	10.6	83.6		
Poole Harbour	17 Nov	17 Nov	1	4	4	0	-				100		
Portsmouth Harbour	7 Nov	6 Dee	7	593	593	5.9	2.06				100		
Stour	22 Sep	3 Dec	37	3,485	2,332	0.39	1.29	27.1	21.4	45			6.5
Thames	1 Oct	29 Nov	23	51,419	25,191	0.96	2.11	14.2	85.8				
The Solent	25 Nov	25 Nov	4	371	371	(1.08)	1.3	4.3	95.7				
The Wash	24 Sep	30 Nov	14	14,964	12,094	0.25	1.43		31.7	48.1			20.2
Totals	22 Sep	13 Dee	263	123,549	86,627	0.9	1.98	15.5	47.3	9.8	21.5	5.9	

Note: percentage young in parentheses are based on small sample sizes (less than 500 birds aged)

proportion of 0.9%. The largest numbers of birds aged were on the Thames Estuary (21,191), Langstone Harbour (13,285), The Wash (12,094), Chichester Harbour (9,453) and The Blackwater, Essex (8,367). Sample sizes at all other estuaries were less than 4,000 birds.

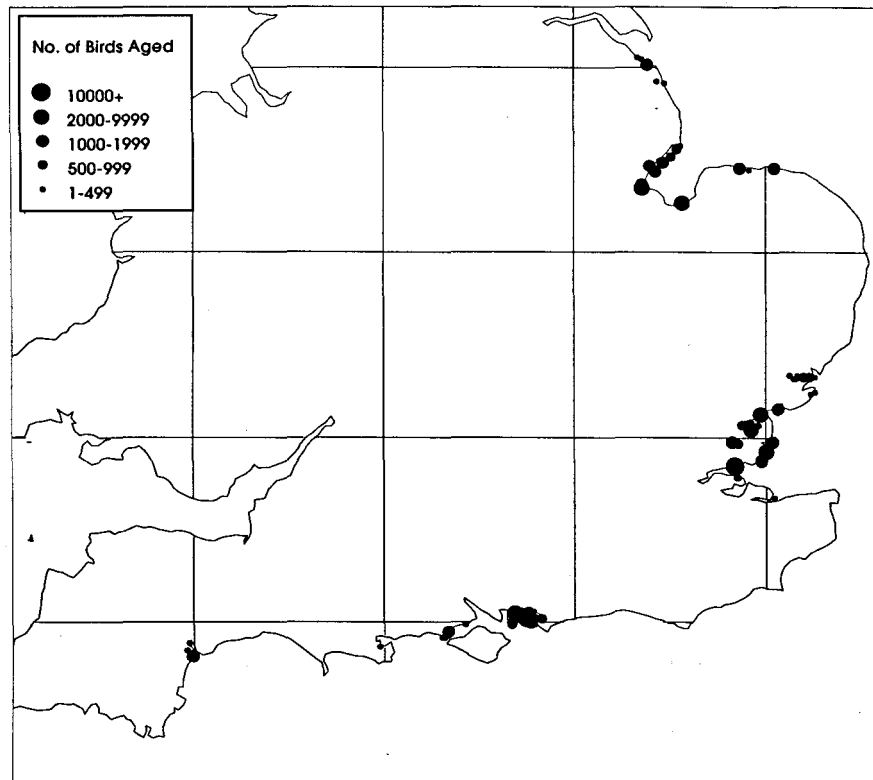


Figure 1.

Distribution of locations where Dark-bellied Brent Geese were aged, autumn 1998 (in addition, two locations on Jersey are not shown [sample size <499]).

Despite the small number of juveniles, the average proportion of young present in flocks for each month was calculated (Figure 2). This increased as the winter period advanced, from 0% in September, 0.79% in October, 0.97% in November to 1.16% in December, matching the typical arrival pattern of Brent Geese into the UK, with non-breeding birds and failed pairs arriving before family groups (however, see Discussion).

Geese were recorded in one of five main habitat types: water, intertidal mud/shore (including *Zostera* beds), saltmarsh, grass/pasture and cereal fields, which for the first time included Rape crops. The first three habitat types, which together represent all intertidal habitats, supported 72.6% of birds counted, while a further 21.5% were found in grass fields and just 5.9% were counted in cereal fields.

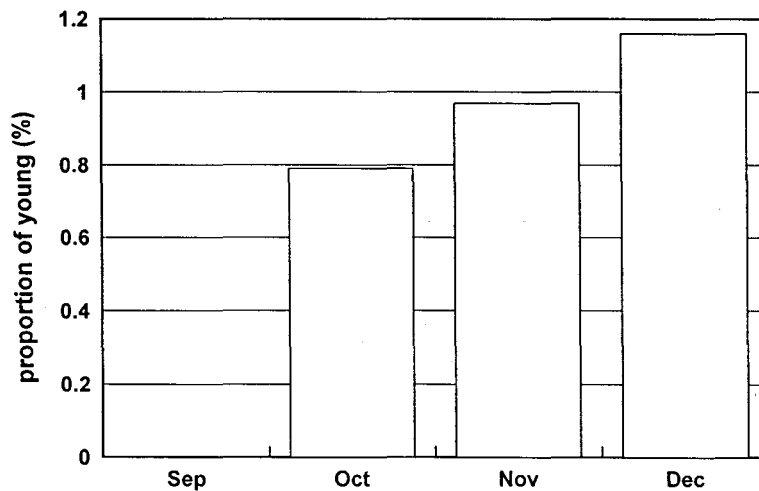


Figure 2. The proportion of young recorded in each month, autumn 1998.

Previous estimates have found greater proportions of families foraging on food types with higher nutritional values, such as cereals (e.g. Hearn 1998). However, during the 1998 census, the number of families were so low that no pattern of this type was shown.

DISCUSSION

The proportion of young present in Britain in each year since 1988 is shown Figure 3. The 1998 census revealed, as expected, a breeding failure, thus maintaining the three year cycle of good, poor and variable breeding success, as predicted by Dhondt (1987).

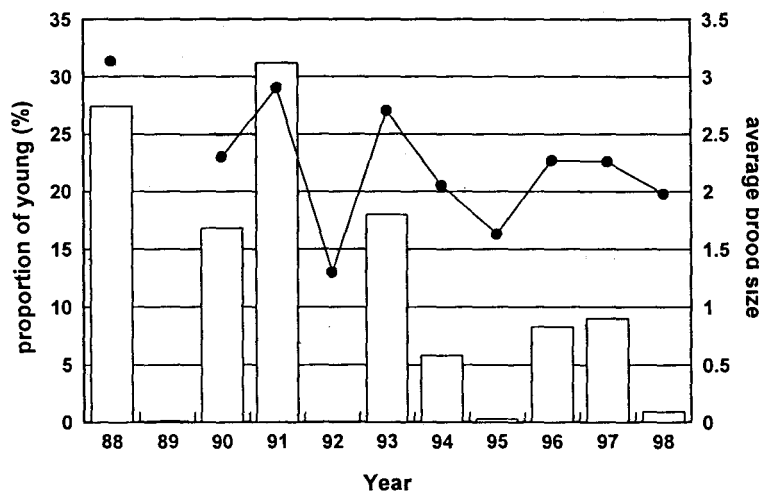


Figure 3. The proportion of young Dark-bellied Brent Geese recorded in Britain, 1988-1998, and the average brood size of successful pairs (note that no data were collected in 1989).

Despite the rather typical autumn arrival pattern shown in Figure 2, the pattern of arrival into England in mid-winter 1998/99 was markedly different

to other years (D. Wood pers. comm.). Flocks monitored closely throughout the winter, primarily in Essex, revealed that there was no apparent arrival of additional families after the census period. Total numbers of Brent Geese did, however, continue to increase. In all, c. 17,000 geese were aged by D. Wood after the census period, with an overall proportion of young of just 0.57%, a significant decrease from the estimate made during the census period. Estimates of productivity from the Netherlands were not available when this report was produced.

The overall estimate of productivity for 1998 (0.9%) is not as low as during the three previous 'poor' years in 1989, 1992 and 1995, when the proportion of juveniles was 0.13%, 0.05% and 0.3%, respectively. However, it continues the recent run of low breeding success where expected 'good' years, such as 1994 and 1997, have recorded relatively low breeding success, in comparison to more typical 'good' years, such as 1988 and 1991.

With an estimated annual rate of mortality of around 15% (Summers & Underhill 1991), productivity has not been thought sufficient to compensate for this since 1993, and declines in the total population are surely occurring. The mid-winter peak counts in Britain have showed declines since the early 1990s, from a high of 137,944 in January 1992 to a low of 99,045 in December 1997 (Cranswick *et al.* in press), although fluctuations below 99,000, reflecting low productivity, occurred in 1992/93 and again in 1996/97. This latter count of 93,677, although possibly not the true peak count of the winter, as later counts in January, when peak numbers typically occur in the UK, were affected by poor weather conditions, was the first sign of a decline in numbers of adults, as productivity was greater in 1996 than 1995.

However, wintering numbers in Britain are dependent on other factors in addition to breeding productivity, such as the severity of winter temperatures, and therefore, it is not possible to accurately assess the effect on the total population that these recent poor breeding seasons are having from UK wintering numbers alone. Consequently, with no accurate census figures from other wintering range countries, this estimate of decline must remain speculation.

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REFERENCES

- Cranswick, P.A., Pollitt, M.S., Musgrove, A.J. & Hughes, RC. in press. *The Wetland Bird Survey 1997-98: Wildfowl and Wader Counts*. BTO/WWT/RSPB/JNCC, Slim bridge.
- Dhondt, A.A. 1987. Cycles of lemmings and Brent Geese *Branta b. bernic/a*: a comment on the hypothesis of Roselaar and Summers. *Bird Study* 34: 151-154.
- Hearn, RD. 1998. *An assessment of breeding success in the Dark-bellied Brent Goose Branta b. bernicla in 1997*. WWT report to JNCC. Slimbridge, 5 pp.
- RSPB *et al.* 1996. *Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man*. RSPB, Sandy.
- Summers, RW. & Underhill, L.G. 1991. The growth of the population of Dark-bellied Brent Geese *Branta b. bernicla* between 1955 and 1988. *J. Appl. Ecol.* 28: 574-585.
- Stroud, D.A., Mudge, G.P. & Pienkowski, M.W. 1990. *Protecting internationally important birds sites: a review of the EEC Special Protection Area network in Great Britain*. NCC, Peterborough.
- Waters, R.J., Cranswick, P.A., Musgrove, A.J. & Pollitt, M.S. 1998. *The Wetland Bird Survey 1996-97: Wildfowl and Wader Counts*. BTO/WWT/RSPB/JNCC, Slimbridge.

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