

WWT/JNCC/SNH Goose & Swan Monitoring Programme survey results 2008/09

Dark-bellied Brent Goose *Branta bernicla bernicla*

1. Abundance

The abundance of Dark-bellied Brent Geese during 2008/09 was monitored through the Wetland Bird Survey (WeBS).

2. Breeding success

For the twenty-fourth consecutive winter, experienced volunteer observers assessed the breeding performance of Dark-bellied Brent Geese in winter 2008/09 (for methods see Hall 2008; Dark-bellied Brent Goose Age Assessment report 2008). Geese were aged at a total of 154 localities within 17 estuaries or coastal areas on the English east and south coasts, from the Humber Estuary to The Solent. Data were collected between 19 September 2008 and 5 April 2009.

Of the 314 flocks assessed, 8.3% were in October, the majority were in November (42.4%), decreasing to 17.8% in December and January, and 9.9% in February. Only ten flocks were aged in March (3.2%) and one flock (0.3%) in September and April. A total of 91,155 geese was aged; an increase of 8.1% on the number aged during 2007/08 and 15.3% higher than the previous five year mean. The highest numbers were aged at Thames Estuary (15,361), Blackwater Estuary (15,292) and North Norfolk Coast (12,996), and between 7,000 and 10,000 individuals were aged at The Wash, Langstone Harbour, Chichester Harbour and The Solent. Sample sizes at all other sites were smaller than 5000 birds, with fewer than 500 individuals aged at five sites. The overall proportion of young birds was 1.1% and, of the 294 broods recorded, the mean brood size was 1.74 (± 0.06 SE) young per successful pair.



Sites in the UK at which Dark-bellied Brent Geese were aged during winter 2008/09. See table below for key to sites.

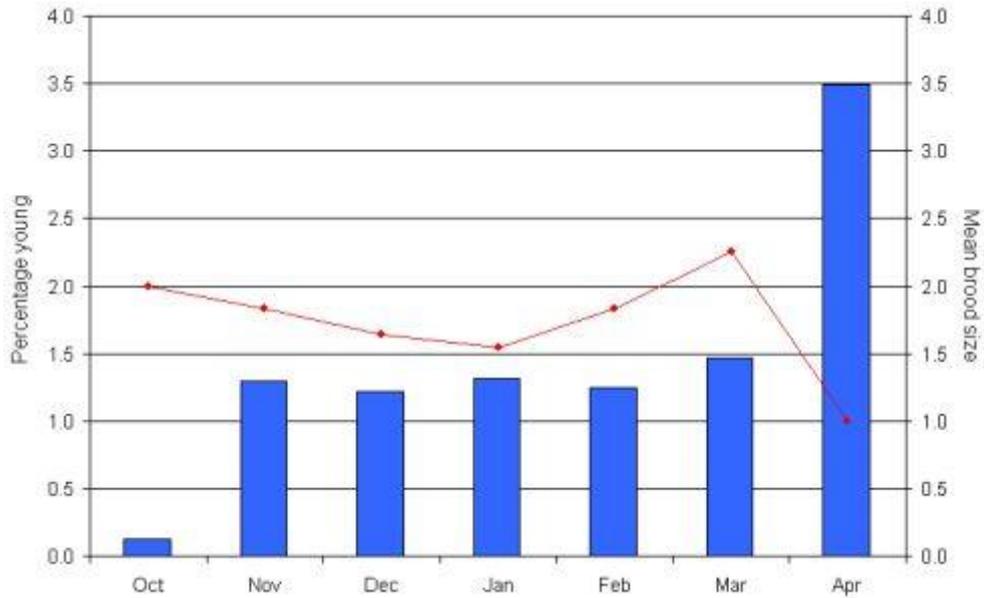
Numbers of Dark-bellied Brent Geese aged at British estuaries and coastal areas in winter 2008/09.

Estuary	Sample flocks			No. sites	Total aged	% young	Mean brood size	SE
	First	Last	n					
1 The Solent	19 Oct	23 Feb	45	14	7,025	1.2	1.74	0.19
2 Beaulieu Estuary	24 Oct	18 Jan	6	1	1,093	0.8	1.29	0.18
3 Langstone Harbour	24 Oct	31 Jan	41	19	8,471	1.5	1.83	0.12
4 Chichester Harbour	22 Oct	14 Jan	23	13	7,251	1.2	1.89	0.16
5 Medway/Swale Estuaries	12 Nov	18 Jan	7	6	272	9.6	2.50	0.52
6 Thames Estuary	06 Oct	26 Feb	10	3	15,361	0.2	2.80	0.42
7 Crouch Estuary	20 Nov	26 Jan	8	7	4,609	1.0	1.25	0.18
8 Blackwater Estuary	03 Nov	05 Apr	24	13	15,292	1.2	1.00	0.00
9 Colne Estuary	16 Jan	16 Jan	2	1	282	0.4	1.00	0.00
10 Hamford Water	24 Nov	03 Feb	13	7	4,258	0.8	1.73	0.28
11 Stour Estuary	19 Sep	04 Feb	47	18	1,956	1.9	1.28	0.14
12 Orwell Estuary	19 Nov	19 Nov	1	1	75	0.0	-	-
13 Alde-Ore Estuary	11 Dec	14 Dec	3	1	59	6.8	-	-
14 North Norfolk Coast	31 Oct	30 Mar	48	26	12,996	1.2	1.74	0.16
15 The Wash	19 Nov	18 Feb	22	15	9,858	1.2	1.52	0.13
16 North Lincolnshire Coast	20 Oct	15 Jan	11	7	1,889	1.1	3.50	0.50
17 Humber Estuary	12 Nov	16 Dec	3	2	408	1.7	2.50	0.50
Total	19 Sep	05 Apr	314	154	91,155	1.1	1.74	0.06

The proportion of young present in flocks increased from a low of 0.1% in October to 1.5% in March, fluctuating only slightly throughout the winter. It then rose to a peak of 3.5% in April, though the sample of aged birds was notably lower than in previous months. No young geese were seen amongst flocks in September. The mean brood size of successful pairs varied little during this time, peaking at 2.25 (\pm 0.63 SE) in March. No brood sizes were recorded in September.

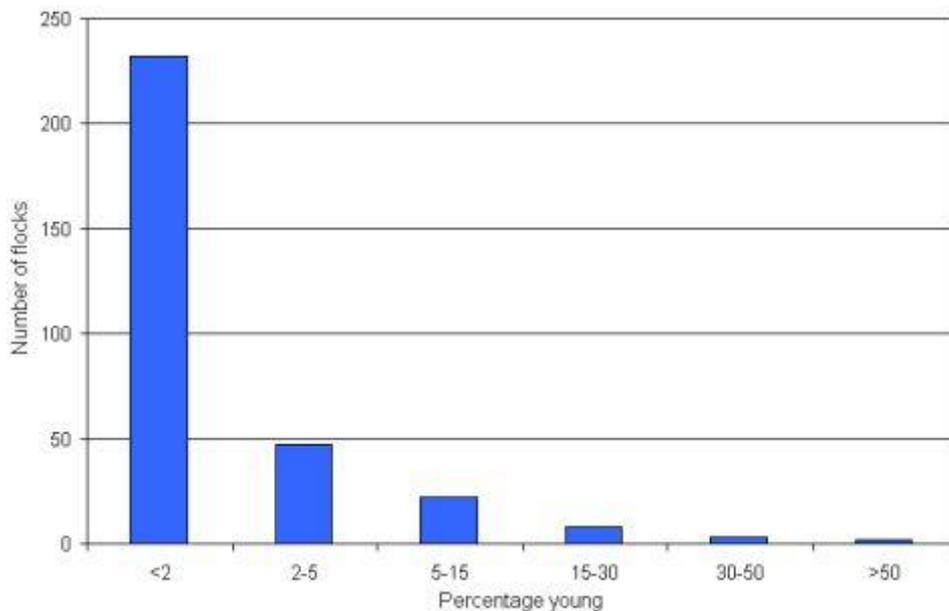
The proportion of young and mean brood size of Dark-bellied Brent Geese in the UK during winter 2008/09.

Month	Proportion of young		Mean brood size		
	overall	n	Mean	SE	n
Sep	0	11	-	-	-
Oct	0.1	16,855	2.00	0.42	10
Nov	1.3	26,995	1.84	0.09	141
Dec	1.2	16,160	1.64	0.11	80
Jan	1.3	14,808	1.55	0.11	44
Feb	1.3	14,472	1.83	0.32	12
Mar	1.5	1,768	2.25	0.63	4
Apr	3.5	86	1.00	0.00	3
Total	1.1	91,155	1.74	0.06	294



The percentage of young (blue columns) and mean brood size (red circles) of Dark-bellied Brent Geese in the UK during winter 2008/09.

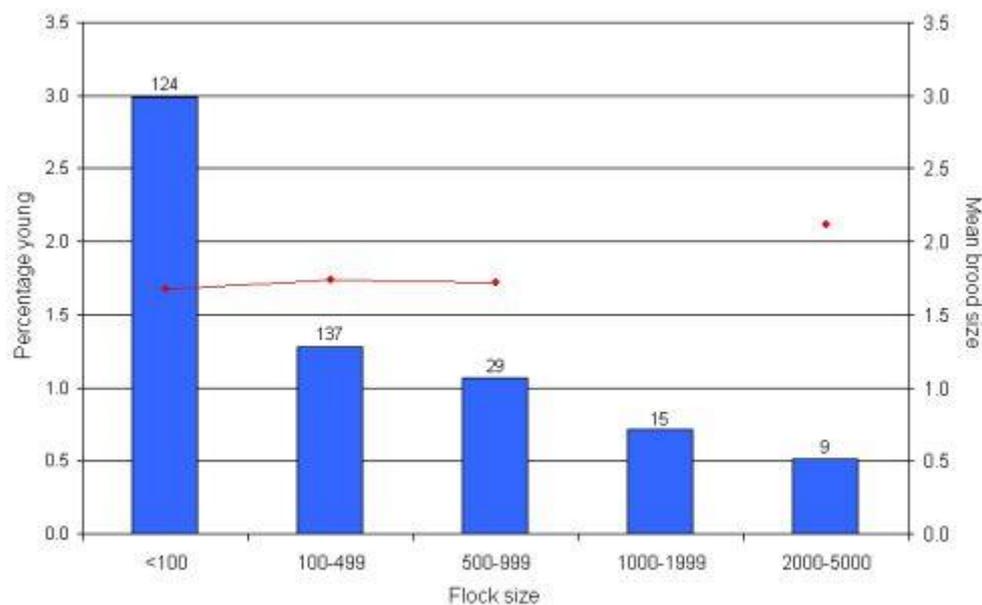
The proportion of young within individual flocks varied from 0.1% to 66.7% (not including one reported 'flock' of one juvenile). The majority of flocks (73.9%, n = 232) contained <2% young, of which 131 contained no young at all. As the proportion of young increased above 2%, the number of flocks within each class greatly decreased; 47 flocks held 25% young, 22 flocks (7.0%) held 5-15% young, and eight (2.5%), three (1.0%) and two (0.6%) contained 15-30%, 30-50% and >50% young, respectively.



Frequency distribution of the percentage of young in individual flocks (n=314) of Dark-bellied Brent Geese in the UK during winter 2008/09.

The proportion of young decreased across flock size, with the highest observed in flocks of fewer than 100 geese (3.0%), and the lowest recorded amongst flocks of 2,000-5,000 birds (0.5%). Mean brood size varied between

1.74 and 2.12 young per successful pair, the largest recorded in flocks of 2,000-5,000 birds (± 0.32 SE). No brood sizes were recorded for flocks of 1,000-1,999 geese.



The percentage of young (blue columns) and mean brood size (red circles) of Dark-bellied Brent Geese in the UK in flocks of different size during winter 2008/09 (sample sizes are given above columns).

3. Discussion

Results from age assessments made at wintering sites in the UK indicate that 2008 was a poor breeding season for Dark-bellied Brent Geese. The overall proportion of young was 9.9% lower than in the previous year and well below the most recent ten-year mean ($10.1\% \pm 3.0$ SE). There was a marked decrease in the number of broods observed compared with 2007 and the mean brood size was also lower, reflecting the poor breeding success.

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. Between the mid 1990s and 2005, whilst there was still considerable annual variation in Brent breeding success, the pattern shifted away from a predictable three-yearly cycle, and there were fewer than expected good breeding seasons. This suggests that the connection between rodent abundance and breeding success may no longer function in the same way, or that rodent abundance is no longer following such a predictable pattern. Between 2005 and 2007, however, breeding success was good in 2005 (28.4% young), poor in 2006 (2.0%) and, if compared with other years, variable in 2007 (11%). This also followed a similar pattern to that of lemming abundance at the breeding grounds, which saw exceptionally high numbers in 2005, a crash in 2006 and a variable year in 2007. Whilst these results suggest productivity may be returning to the more predictable three-yearly cycle, the poor success in 2008 does not continue the pattern. In 2008, reports from monitoring stations along the breeding grounds at the Taimyr Peninsula, Russia, indicate that lemmings were common in some areas, although numbers dropped dramatically as the summer progressed, but rare in others, and Arctic Foxes were common (Soloviev & Tomkovich 2009). The summer was also generally colder than the previous year. Together these factors could have influenced the breeding success of the Brent Geese, producing a poorer season than expected.

Reductions in the number of good breeding seasons in recent years led to a decline in the population of approximately 30% both nationally and internationally (Musgrove et al 2007; Wetlands International 2006.) leading to the species being listed as 'Vulnerable' according to the European Red List criteria (BirdLife International 2004.). An increase in the frequency of breeding seasons where the proportion of young birds is

greater than mortality (15%; Summers & Underhill 1991.) is likely to be needed for there to be any significant improvement in population status. Encouragingly, results from the Wetland Bird Survey (WeBS) suggest wintering numbers have started increasing again in Britain, with the peak count in 2007/08 being the highest recorded since 2000/01. How much of an effect the poor breeding season in 2008 has had on these numbers will not be known until the 2008/09 WeBS results are available in 2010.

Birds of Conservation Concern 3 (published in 2009), which reviews the status of birds occurring in the UK, included for the first time an assessment of some species at race level. At species level Brent Goose qualifies as an Amber-listed species (of medium conservation concern). When assessed at race level, however, Dark-bellied Brent Goose is a Red-listed listed species (of high conservation concern) and has qualified as such due to it being listed as Globally Threatened using IUCN criteria.

4. References

Hall, C. 2008. The breeding success of Dark-bellied Brent Geese *Branta bernicla bernicla* in 2007, as assessed in the UK. Wildfowl & Wetlands Trust Report, Slimbridge.

Dhondt, AA. 1987. Cycles of lemmings and Brent Geese *Branta b. bernicla*: a comment on the hypothesis of Roselaar and Summers. *Bird Study* 34: 151-154.

Soloviev, M & P Tomkovich. (Eds.) 2009. *ARCTIC BIRDS: an international breeding conditions survey*. Online database: <http://www.arcticbirds.ru/> Accessed 5 June 2009.

Wetlands International. 2006. *Waterbird Population Estimates – Fourth Edition*. Wetlands International, Wageningen, The Netherlands.

BirdLife International. 2004. *Birds in Europe: population estimates, trends and conservation status*. Cambridge, UK. BirdLife International. BirdLife Conservation Series No. 12.

Summers, RW & LG Underhill. 1991. The growth of the population of Dark-bellied Brent Geese *Branta b. bernicla* between 1955 and 1988. *Journal of Applied Ecology* 28: 574-585.

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Goose & Swan Monitoring