

**AN ASSESSMENT OF BREEDING SUCCESS IN THE DARK-BELLIED BRENT
GOOSE IN 1991**

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SUMMARY

Some 104,000 Dark-bellied Brent Geese were counted at 18 estuarine sites in Britain between 8 September and 2 December 1991, and the proportions of juveniles present and brood sizes were recorded for many of the flocks. Most of the recorded flocks were observed within intertidal areas, whilst many of those in southern England were on grass. Of 63,030 geese aged, 31.2% were juveniles, thus revealing a high level of breeding success for the population in summer 1991. There was considerable variability amongst the samples taken, both between sites and habitats. Average brood size was 2.9 juveniles per pair overall.

INTRODUCTION AND METHODS

For the seventh consecutive autumn, breeding performance in Dark-Bellied Brent Geese *Branta bernicla bernicla* was assessed by experienced voluntary observers at a number of coastal sites in Britain. These observations are organised by the WWT under contract to the Joint Nature Conservation Committee and, as well as providing material for research purposes, are used as means of forecasting whether there are likely to be large numbers of geese frequenting farmers fields in the coming winter. Here, I report the results of observations made between 8 September and 2 December 1991.

Both the proportion of young birds in flocks and family sizes were recorded during observations on more than 50 dates during autumn and early winter (September to December). During this time, visits were made to 18 estuarine sites, and a total of 287 counts were made in 83 different sectors of these estuaries (Table 1). The coverage achieved, and consequently the number of geese counted and aged (see below) was much greater than in 1990, when only 12 sites were visited and 161 counts made (Kirby 1991): Nine of the included estuaries received up to ten visits, with the Colne being visited only once and Southampton Water only twice. The sites receiving by far the greatest number of visits were the Wash (45 visits), Langstone (40) and Chichester (39) Harbours and the North Norfolk Marshes (29), the coverage of these being achieved by several counters visiting different sectors of the site on the same day (Table 1).

RESULTS AND DISCUSSION

Numbers and distribution

Table 1 shows total numbers of birds counted at each site, maximum flock sizes and the distribution of the birds counted in relation to five habitat types (note that birds sitting on the water are classified separately). This census does not aim to assess total numbers at each site (only breeding performance) and the results cannot be used for this purpose, as the counts of different areas are mostly not synchronous. Thus the grand total of almost 104,000 birds certainly includes many repeat counts of the same flocks. The largest numbers observed were on the Wash, Blackwater, Thames and Chichester Harbour, with these sites together contributing almost 72% of the total number of birds observed. The largest flocks were recorded in Essex, with 6,000 on the Blackwater, 4,500 at Foulness and 6,500 at Leigh. In addition to these, only the Wash and the Exe supported flocks of 2,000 or more birds.

Table 1. Numbers of Dark-bellied Brent Geese and the proportions (%) on different habitats at a number of British estuaries. For the positions of each estuary, refer to Kirby et al. (1991).

SITE	NO. VISITS	NO. SECTORS	COUNT TOTAL	MAX. FLOCK	MUD	WATER	MARSH	GRASS	CEREAL
Humber	18	5	3,030	609	0.0	0.0	100.0	0.0	0.0
Wash	45	11	24,871	2,000	0.2	0.0	93.0	6.2	0.6
North	29	5	3,464	800	3.0	9.6	32.2	23.1	32.0
Deben	3	1	1,049	969	5.7	0.0	1.9	0.0	92.4
Orwell	9	4	649	248	18.5	1.7	4.6	0.0	75.2
Stour	11	4	2,994	647	22.7	38.9	38.4	0.0	0.0
CoIne *	1	1	51	51	0.0	0.0	100.0	0.0	0.0
Blackwater	10	5	11,117	6,000	0.0	5.7	0.0	94.3	0.0
Foulness,	8	2	13,554	4,500	0.0	85.2	0.0	14.8	0.0
Leigh,	20	1	15,186	6,500	50.6	49.4	0.0	0.0	0.0
Medway	10	1	1,013	209	0.0	0.0	100.0	0.0	0.0
Chichester	39	18	10,009	1,100	2.6	49.3	7.0	39.3	1.7
Langstone	40	6	6,097	1,460	0.0	26.0	0.4	72.2	1.4
Southampton	2	1	59	34	42.4	57.6	0.0	0.0	0.0
Beaulieu	5	5	1,089	652	37.6	0.0	2.5	59.9	0.0
North West	17	7	3,491	700	52.4	33.9	0.0	13.7	0.0
Poole	13	3	316	105	55.4	44.6	0.0	0.0	0.0
Exe	7	3	5,927	2,500	0.0	100.0	0.0	0.0	0.0
TOTALS	287	83	103,966	6,500	11.0	33.7	29.1	23.4	2.9

* note that few geese were counted at these sites.

In the same way that caution is necessary when considering the numbers at particular sites, the same is true when considering the distribution of the geese across habitats. This is because not all habitats were visited equally intensively as observers selected

where they wished to view the geese. Of all birds counted, the vast majority were in intertidal areas, with 11 % occupying mudflats, ca.34% on the sea and ca.29% on saltmarshes (Table 1). A significant proportion of geese fed in grass fields also (ca.24%) but relatively few overall were observed in cereal fields. However, the numbers of birds counted in each habitat varied between sites, perhaps reflecting to some degree the preferences of the geese themselves, rather than that of the observers. Intertidal areas supported most birds in the majority of estuaries, whilst many birds made use of grass along the southern coast of England e.g. in the harbours of Chichester and Langstone and on the Beaulieu (Table I). The only sizeable flocks recorded on cereals involved birds close to the Deben and Orwell estuaries.

Productivity

Of all geese aged (63,030), 31.2% were juveniles (Table 2), indicating that the birds had bred very successfully in 1991. This compares with 34.4% young in 1988, less than 1% young in 1989 and 21.4% in 1990. As in previous years, the proportions of young recorded varied considerably both within and between sites. An indication of the magnitude of this variation within sites is provided in Table 2, which shows the minimum and maximum percentage young recorded at each location. For example, some of the many flocks observed on the Wash held no young at all, whilst others held up to ca.75% young. Combining data for each site and treating that as one sample reveals that the flocks with the highest proportion of juveniles were those on the Deben (50.1 %), Leigh, Medway and North West Solent (each around 37%), and the Wash/North Norfolk (34-35%). In contrast, flocks at Foulness, the Beaulieu and Poole Harbour held relatively few young (ca.16-18%).

Table 2. Numbers of Dark-bellied Brent Geese aged and proportions of juveniles recorded.

SITE	TOTAL COUNT	NO. AGED	NO. YOUNG	MIN.	% YOUNG MAX.	TOTAL	% ALL YOUNG
Humber	3,030	2,632	782	9.6	61.9	29.7	4.0
Wash	24,871	14,060	4,991	0.0	74.9	35.5	25.4
North Norfolk	3,464	2,857	958	3.8	77.8	33.5	4.9
Deben	1,049	969	485	50.1	50.1	50.1	2.5
Orwell	649	649	196	10.0	63.6	30.2	1.0
Stour	2,994	1,428	418	17.0	50.0	29.3	2.1
Colne *	51	51	25	49.0	49.0	49.0	0.1
Blackwater	11,117	6,396	2,071	14.0	37.7	32.4	10.5
Foulness,	13,554	7,884	1,414	14.2	23.8	17.9	7.2
Leigh, Thames	15,186	6,528	2,457	3.8	69.5	37.6	12.5
Medway	1,013	930	349	23.8	52.4	37.5	1.8
Chichester	10,009	7,190	2,012	3.2	65.5	28.0	10.2
Langstone	6,097	4,205	1,282	11.1	66.7	30.5	6.5
Southampton	59	59	16	26.5	28.0	27.1	0.1
Beaulieu	1,089	982	165	11.8	25.9	16.8	0.8
North West	3,491	3,200	1,192	0.9	54.5	37.3	6.1
Poole Harbour	316	316	51	5.6	60.0	16.1	0.3
Exe	5,927	2,694	779	15.9	62.3	28.9	4.0
TOT ALS	103,966	63,030	19,643	0.0	77.8	31.2	100.0

* note that the figures for these sites are based on relatively few birds.

The causes of such a high degree of variability in percentage young are likely to be numerous and inter-related. Presumably, the abilities of different observers to make the observations in the first place would be an important factor, as would be the sizes of the flocks recorded; assessments of breeding performance based on small flocks are likely to be based on spurious values. The timing of visits through the season is also presumably important as one might expect the more successful breeders to arrive later than those that have failed. This was demonstrated in last year's report (Kirby 1991), using data from Leigh on Thames provided by C.D. Jolly.

Table 3 shows that differences exist between the proportions of young in flocks on different habitats, and that these vary considerably between sites. All habitat types were capable of supporting a high proportion of juveniles and, unlike in 1990 (Kirby 1991), there were no obvious overall differences between habitats; in 1990, age-ratios from flocks on saltmarshes, grasslands and cereals were generally higher than from flocks on water or mud.

Table 3. The distribution of juvenile Dark-bellied Brent Geese across habitats. For each habitat, the number of geese aged is followed by percentage young.

SITE	MUD		WATER		MARSH		GRASS		CEREAL	
Humber	0	0.0	0	0.0	2,632	29.7	0	0.0	0	0.0
Wash	15	20.0	0	0.0	12,784	34.3	1,112	49.2	149	36.2
North Norfolk	103	18.4	334	39.2	1,117	27.1	193	45.6	1,110	37.6
Deben	0	0.0	0	0.0	0	0.0	0	0.0	969	50.1
OrweU	120	35.8	11	63.6	30	10.0	0	0.0	488	29.3
Stour	481	32.6	616	28.4	331	26.0	0	0.0	0	0.0
Colne *	0	0.0	0	0.0	51	49.0	0	0.0	0	0.0
Blackwater	0	0.0	638	19.0	0	0.0	5,758	33.9	0	0.0
Foulness, Thames	0	0.0	6,464	17.7	0	0.0	1,420	18.9	0	0.0 -
Leigh, Thames	4,609	48.1	1,919	12.5	0	0.0	0	0.0	0	0.0'
Medway	0	0.0	0	0.0	930	37.5	0	0.0	0	0.0
Chichester Harbour	207	38.2	3,657	19.0	703	36.0	2,488	37.3	135	41.5
Langstone Harbour	0	0.0	1,584	27.5	25	48.0	2,515	32.0	81	37.0
Southampton Water *	25	28.0	34	26.5	0	0.0	0	0.0	0	0.0
BeauUeu	303	16.8	0	0.0	27	25.9	652	16.4	0	0.0
North West Solent	1,678	37.5	1,042	34.3	0	0.0	480	42.9	0	0.0
Poole Harbour	175	12.0	141	21.3	0	0.0	0	0.0	0	0.0
Exe	0	0.0	2,694	28.9	0	0.0	0	0.0	0	0.0
TOTALS	7,716	41.8	19,134	21.6	18,630	33.3	14,618	33.5	2,932	40.4

* note that the figures for these sites are based on relatively few birds.

It is perhaps also true that it is easier to make accurate assessments of percentage young on the more inland areas than it is for birds on distant mudflats, since you can generally get closer to the flocks. The relative importance of each of these factors in determining the results you obtain when collating data on breeding success would seem to be worthy of more sophisticated analyses in the near future.

Most pairs of Dark-bellied Brent Geese that were recorded with juveniles had either two (26.1 %), three (24.6%) or four (19.6%) young with them (Table 4), and there was a total of four broods of seven. Most of the broods on the Humber comprised just a single bird, whilst the nearby Wash had many pairs with five young. Overall, the

average brood size was 2.9. This compares with an average 3.2 young per pair in 1988, the most productive season of recent years.

Table 4. Brood sizes of Dark-bellied Brent Geese.

SITE	BROOD SIZES							TOT ALS
	7	6	5	4	3	2	1	
Humber	0	0	3	7	10	17	27	64
Wash	1	21	37	21	28	8	0	116
North Norfolk	1	3	9	26	30	38	22	129
Stour	0	0	1	6	11	11	1	30
Blackwater	0	1	3	7	8	3	6	28
Foulness, Thames	0	1	4	19	18	13	11	66
Leigh, Thames	0	3	14	33	32	36	14	132
Medway	0	0	0	12	25	35	26	98
Chichester Harbour	2	4	7	29	33	41	19	135
Langstone Harbour	0	2	9	25	31	49	32	148
Southampton Water	0	0	0	1	3	1	1	6
Beaulieu	0	0	0	0	2	2	1	5
North West Solent	0	1	1	2	1	1	4	10
Poole Harbour	0	0	0	1	3	3	1	8
Exe	0	2	4	10	15	8	4	43
TOTALS	4	38	92	199	250	266	169	1,018
FREQUENCY(%)	0.4	3.7	9.0	19.6	24.6	26.1	16.6	-

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