

Barnacle Geese caught in Dumfriesshire in February 1963

HUGH BOYD

Summary

A Wildfowl Trust rocket-netting team caught 316 Barnacle Geese at Caerlaverock, Dumfries on 2nd February 1963. These included 94 of 685 ringed in Spitsbergen in the summer of 1962, but none of 609 ringed in East Greenland in 1961, nor any ringed in the Netherlands.

3,000 (2,800-3,200) Barnacle Geese were in the vicinity. Estimates of the total Spitsbergen population in August 1962 from the proportion of recaptures give a most probable value of 2,300, with limits of 1,900-2,900. It seems likely that earlier estimates, based on field observations of rings on 26th October, 1962, were too high because some rings went unseen.

There were 106 males and 82 females in a sample of 188 geese, which included only 5 first-winter birds. Weights of 20 males averaged 1.87 kg. (4 lb. 2 oz.); 15 females averaged 1.69 kg. (3 lb. 12 oz.). These weights suggest that the geese had not been adversely affected by the cold weather.

An Oslo University expedition to Spitsbergen ringed 685 Barnacle Geese in the Hornsund area in the summer of 1962 (T. Larsen and M. Norderhaug, *Wildfowl Trust 14th A.R.*: 98-104, 1963). At least 46 of these ringed geese were believed to have been seen by H. Boyd at Caerlaverock National Nature Reserve, Dumfries, on 26th October, 1962. It was desirable to verify those observations by catching a large sample of the geese frequenting the Reserve. Permission to use rocket-nets for trapping was given by the Nature Conservancy, subject to the restriction that the geese must not be caught on the Reserve itself but only when feeding outside it. The Barnacles began to feed on grass land outside the Reserve boundary early in January 1963 but because of bad weather it was not possible for a rocket-netting team to operate until 1st February. The nets were set that night and 316 geese were caught on 2nd February. The catch included 94 of the geese marked in Spitsbergen in 1962. A British monel-metal ring was added to each of the geese already ringed. Previously unmarked geese were given a British monel ring on the left leg and a white plastic spiral ring on the right leg. After ringing, the geese were released and flew off to the Reserve. The catch had no lasting effect on the behaviour of the geese, which fed in an adjacent field the next morning.

None of 609 Danish rings put on Barnacle Geese in East Greenland in 1961 (R. Marris and M. A. Ogilvie, *Wildfowl Trust 13th A.R.*: 53-64, 1962) nor of the rather larger number used in the Netherlands since 1957 (J. A. Eygenraam, *Wildfowl Trust 11th A.R.*: 77-79, 1960) was found. In conjunction with the very large number of Spitsbergen-ringed birds captured this negative evidence strongly supports the hypothesis that the Solway-wintering flock comprises only geese from Spitsbergen (H. Boyd, *Wildfowl Trust 12th A.R.*: 116-124, 1960). The recoveries so far obtained are also consistent with the supposition that

virtually all Barnacles from Spitsbergen winter in the Solway area. Recoveries of Hornsund-ringed birds outside Spitsbergen have come from Norway, 23 October, 1962; Fair Isle, Shetland, 12 November 1962; Coquet Island, Northumberland, 17 October, 1962; Rockcliffe Marsh, Cumberland, January 1963; the grounds of the Crichton Royal Hospital, Dumfries, where a goose (also carrying a Caerlaverock ring) joined the captive collection of waterfowl on 17 November, 1963; and another 'Solway Firth' 7 December, 1963. Geese ringed at Caerlaverock in February have been found dead at Blaydon-on-Tyne, Co. Durham 17 October, 1963 and on the Solway Firth, probably in Cumberland, 1 December, 1963.

The geese marked in Spitsbergen had all been adults. An estimate of the adult population at the beginning of August 1962 can be obtained from the equation $N = M(C+1)/(R+1)$ where N is the size of the population at that time, M the number marked (685), C the sample inspected (308, = 316 - (316 × 5/188 juveniles); see below for explanation of this ratio) and R the number of marked geese recaptured (94), whence $N = 685 \times 309/95 = 2,230$ adults (to the nearest ten birds), together with about 60 juveniles, a total of 2,290, say 2,300 birds in all. The 95% confidence limits, based on the normal distribution for the ratio R/C and on the Poisson distribution for the ratio of juveniles to adults, suggest that the total Spitsbergen population in early August 1962 was probably within the limits 1,870-2,910.

Counts and estimates by the rocket-netting party put the number of Barnacle Geese at Caerlaverock on 2nd February, 1963 at 3,000 (2,800-3,200), a figure slightly higher than the largest estimates earlier in the autumn and winter. It is not known whether any substantial numbers were present at the same time in the two other areas on the shores of the Solway Firth that are frequented by Barnacles, but there were

probably few elsewhere, since this was a Saturday at the height of the shore-shooting season, so that those other places were likely to be disturbed.

Even though the Barnacle Goose is legally protected on the mainland of Scotland and in England and is especially guarded on the Caerlaverock Reserve it is quite certain that the Spitsbergen population must have been larger in August 1962 than in February 1963, because of losses during the intervening six months. Thus the visual estimate in February (2,800-3,200) is barely compatible with the capture-recapture estimate for August (1,900-2,900). This is a reversal of the situation which emerged from the observations of October 1962 when 46 Spitsbergen rings were seen in 250 Caerlaverock geese, leading to an estimate for August 1962 of 3,860 (limits 2,960-5,240), compared with a maximum count in October of 2,700 (E. L. Roberts). The discrepancy between the proportion of rings in the geese handled in February and in those seen in October is considerable. A difference as great or greater would be unlikely to occur by chance more than once in 500 comparisons if the two samples were drawn from a single population. The two most likely sources of discrepancy seem to be: (1) failure to detect all the rings present in the sample inspected in October, or (2) non-random mixing of ringed and unringed geese within the Caerlaverock flock. It seems likely that some rings were not seen in October, but also that the mixing of ringed and unringed geese was incomplete, even though the frequency of Spitsbergen rings within sub-samples of the February catch corresponded well to a binomial distribution with a mean of 7.5 rings per 25 geese handled: and the observations in October similarly indicated thorough mixing within the group inspected. However, this does not rule out the possibility of important variations in the proportion of ringed geese in different parts of the entire Solway flock.

Sex- and age-ratios

The geese were not caught until late afternoon and many of them had to be dealt with after dark. This restricted the amount of information that could be obtained about each individual. 188 geese were sexed by cloacal examination: 106 were found to be males and 82 females. Only 5 of these 188 (2.7%) were recorded as in first-winter

plumage. It is doubtful whether the recognition of young birds was complete even in this sample, because it was difficult to examine them adequately in the poor light. This is regrettable, as it increases the uncertainty of population estimates based on capture-recapture procedures. It is however unlikely that the proportion of first-winter birds was as high as 5.3%, the proportion observed in October, 1962.

Weight

A few of the first geese to be handled were weighed. 20 adult males averaged 1.87 ± 0.032 kg. (4 lb. 2 ozs.), ranging from 1.59 to 2.10 kg. 15 females averaged 1.69 ± 0.033 kg. (3 lb. 12 ozs.) ranging from 1.42 to 1.87 kg. The females included two first-winter birds, weighing 1.59 and 1.64 kg. According to the *Handbook of British Birds* (vol. III: 210. 1939) H. L. Popham recorded the average weight of 55 Barnacles as 4 lb. (1.81 kg.) with limits of $2\frac{1}{2}$ - 5 lb. (1.13 - 2.26 kg.). R. Marris weighed a small group of flightless adults in Reindalen, Spitsbergen in July 1954: 12 males had a mean weight of 1.91 kg. (range 1.65 - 2.05 kg.); 11 females had a mean weight of 1.68 kg. (range 1.55 - 1.95 kg.). Thus it seems as if the weights of the geese caught at Caerlaverock were in no way abnormal. The Solway area had been experiencing unusually low air temperatures in January 1963, as had most parts of Britain, but the vicinity of the Caerlaverock Reserve had had very little snow, so that plenty of grass was available despite extensive patches of ice on the salt-marsh within the Reserve itself.

Acknowledgements

The rocket-netting team consisted of A. B. Hall, E. A. Maxwell, R. J. F. Taylor and three members of the Trust staff - J. V. Beer, H. Boyd and M. A. Ogilvie. Mr. E. L. Roberts, Warden of Caerlaverock National Nature Reserve, and his wife gave us enthusiastic and skilful assistance, for which we are most grateful. We are also much indebted to Mr. Adie, factor of the Duke of Norfolk's Lantonside estate, and to Mr. J. Armstrong for permission to use the rocket-nets. Mr. Magnar Norderhaug has collaborated closely by providing information on ringing and observations in Spitsbergen. Dr. Russell Marris has kindly allowed the use of his unpublished data on goose weights.