The geese of Wrangel Island

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Summary

In 1960 there were about 130,000 occupied nests of Lesser Snow Geese in their main colony on Wrangel Island. In 1964, when the spring weather was extremely unfavourable for reproduction, about 114,000 nests were in use, with about 300,000 geese in the nesting areas. In 1964 the average clutch-size was 3·27 eggs, compared with 5–6 in normal years. Nests in areas where the snow persisted longest and where the bird population was less dense contained fewest eggs. A large number of mature birds failed to nest although their gonads were normally developed. Non-breeders were most numerous in areas where the snow melted late. The average size of young broods was 2·7 goslings, range 1–5. Nesting in 1958 was probably even later than in 1964. 1–2,000 pairs of Pacific Brent Geese were nesting on the island in 1964 and another 10,000 non-breeders were moulting there. Moulting Brent caught included four previously ringed in Alaska, also when moulting.

Introduction

Wrangel Island (71°N, 180°), which has long remained uninhabited, is now the main world nesting centre of the Lesser Snow Goose, *Anser caerulescens caerulescens*. Up to the middle of the last century the bird was widely distributed over the continental tundra of Siberia and on islands in the Arctic Ocean west to the lower reaches of the River Ob (75°E), as well as along the Arctic coasts of North America. The birds wintered at this time in Japan and apparently on the shores of the Caspian, as well as in southern North America. The drastic reduction in numbers and restriction of habitat of the Siberian geese are due principally to their annihilation in their wintering grounds, especially in the Far West, on the North American prairies, which were extensively colonised by European emigrants in the middle of last century. Another contributory factor was obviously the changes in the terrain caused by ploughing the prairies.

The birds' breeding grounds on Wrangel Island were studied for the first time by the author in 1960. Land and air surveys revealed that the main colony was in the valley of the River Tundrovaya, near the foot of Tundrovoi Peak. The total number of occupied nests in the colony was assessed at approximately 130,000. In addition to the main colony there were several small colonies on the island, and the total number of nests of this species on the island was approximately 200,000, the number of nesting birds being 400,000 (S.M. Uspenski, 1963). In 1964 we carried out fresh investigations to obtain more complete and up-to-date information on the ecology, distribution and numbers of *A.caerulescens caerulescens*.

It should be noted that the spring of 1964 was delayed on Wrangel Island. An adverse maximum air temperature was maintained until 27th May and blizzards occurred up to the end of the month. The snow began to melt only on 24th May, and the break-up of the snow covering was delayed by subsequent cold spells. The adverse weather conditions disturbed the normal life cycle of the geese, reducing the size of the clutches and causing a large number of birds to refrain from nesting. There have, of course, been years in which weather conditions were even less favourable; for example, according to A. I. Mineev (1945, p. 364), in 1931 'as had never happened before, the tundra was completely covered with snow during the whole of June and part of July, and there was a blizzard even in mid-June. We saw enormous numbers of geese flying around in search of nesting sites, but without success'.

According to the results of questionnaires and our own observations, these geese arrive and lay their eggs at the periods shown in Table I.

Observations show that in spring the birds fly to the island on a broad front, from the south-east and south-south-east. Following this direction, they reach the main nesting site.

On arrival, the oviducts of the females contained fully formed eggs; the ovaries usually also contained 6–8 large ripe follicles. However, the birds were unable to utilise these, and the follicles were reabsorbed during the first few days after arrival. Whereas in years of normal weather the clutches consist of 5–6 eggs, the clutch in 1964 was 3 eggs in most cases. It was a characteristic feature that the nests in parts of the colony where the snow disappeared last and where the bird population was not dense contained the smallest numbers of eggs. On the other hand, breeding was relatively satisfactory where the snow melted early and where the birds nested densely (Table II).

The failure of a large number of mature birds to nest, although they were well fed on arrival and had normally developed

Table I. Timing of events in the breeding cycle of Lesser Snow Geese on Wrangel Island, 1955–64

year	*start of migratory arrival*	*start of mass arrival*	*start of laying*	*start of mass laying*	*Observations*
1955	–	–	–	June 2	
1957	May 22	May 25	May 26	June 2	
1958	–	–	June 10	June 13	much snow during winter, late spring
1959	–	–	–	June 1	
1960	–	–	May 31	June 6	
1962	–	–	June 2	–	
1963	May 21	May 25	May 30	June 3	
1964	May 21	June 4	June 5	June 8	long late spring

Table II. Variations in clutch-size with nesting density of Lesser Snow Geese on Wrangel Island, 1964

nesting site areas	*no. of nests examined*	*maximum no. of eggs in nest*	*average no. of eggs in nest*
Low nesting density (up to 20 pairs per hectare)	133	5	3·18
Average nesting density (20–50 pairs per hectare)	190	6	3·24
High nesting density (50–100 pairs per hectare)	322	7	3·55
Total	645		3·27

Table III. Nest occupancy and nest density of Lesser Snow Geese on Wrangel Island, 1964

nesting site areas	*no. of occupied nests*	*no. of unoccupied nests discovered*	*percentage of nests unoccupied*
Low nesting density	133	44	24·8
Average nesting density	190	32	14·4
High nesting density	322	20	5·8
Total for nesting site	645	96	12·9

Table IV. Total number of nests of Lesser Snow Geese on Wrangel Island in use in June, 1964

nesting site areas	*total area (hectares)*	*average no. of nests per hectare*	*total no. of occupied nests*
Low nesting density	1,200	12	14,400
Average nesting density	1,900	36	59,400
High nesting density	600	64	38,400
Total for nesting site	3,700		114,200

gonads, was shown by the results of dissection and by the fact that many nests were not used by the birds (although the geese occupy the last year's nests first). It was typical that non-breeding individuals reached the highest percentage in areas where the snow was late in melting and nesting density was at its lowest (Table III).

We have intentionally dwelt on some details of the effect of weather conditions on goose breeding rates, taking the view that these facts throw some light on an interesting but little studied phenomenon –'arctic failure to nest' in birds.

According to the periods at which the eggs were laid, the first goslings appeared in the nests of these geese on 1st–2nd July, 1964. The colony began to break up on 3rd–4th, and the mass departure occurred on 6th–8th; the colony was practically deserted by 10th July, although individual late broods were still being encountered here on 14th–15th. According to surveys carried on 7th–8th July, the average number of goslings per brood (based on 33 families) was 2·7, varying from 1 to 5. Birds which have not bred finish their moult and start to leave the island during the first ten days of August, whereas the birds which have bred and the young of the year start to leave during the second ten days of August. The departure of the birds usually ends between 20th and 30th August.

In 1964 we were able to conduct a more careful survey of the birds in the main colony. It was carried out (by marking out 50 test areas of 0·25 hectares each, evenly distributed over the nesting site) immediately after the birds had finished laying (15th–20th June) and gave the results shown in Table IV.

In addition to surveying the nests, a continuous visual count was made during this period of the birds on the nesting site. Their numbers were assessed at 300,000 (150,000–160,000 pairs), so the results of surveying the nests and of counting the geese themselves more or less coincided.

A wildlife reserve was set up on Wrangel Island in 1960, to protect the nesting sites of the geese (and the Polar Bears, large numbers of which make their dens here). Since then, collection of goose eggs and other forms of exploitation have ceased, and this has undoubtedly contributed to the increase in the birds' numbers. This is clearly shown by a comparison of our 1960 and 1964 survey results (especially when one remembers that some of the birds did not nest in 1964).

The second type of nesting site used by *A.c.caerulescens* on the island is the small separate colony, or even single pairs, which sometimes nest with Brent Geese and Eiders *Somateria mollissima v-nigra* near the nests of Snowy Owls. The Arctic Fox is the main cause of loss of eggs, and this was apparently the reason for the formation of the two types of nesting site. In the first case the safety of the eggs is in some measure assured by the relatively effective collective self-defence measures adopted by the birds; observations show (we have no large-scale figures) that predators do most damage to pairs nesting on the edges of the colony or in its sparsely populated areas. The birds in the nucleus of the colony suffer practically no loss from predators. The small separate nesting sites (in 1964, breeding on these sites was even less successful) can exist only because of the energetic defence of their own and the goose nests by Snowy Owls.

It was stated above that nesting density in the main colony fluctuates within very wide limits. It depends both on relief and exposure, which determine when the snow melts, and on the condition of the grass. Throughout the incubation period the birds feed only in their own nesting areas (among the plants eaten by them are several species of grass, *Equisetum* and the green parts of creeping willow). Thus the dimensions of these areas are directly determined by the state of the grazing, by the supply of plant life.

The large-scale ringing of these geese, both on Wrangel Island (where it started in 1960) and in North America has given a fairly complete picture of the migration routes and wintering grounds of this population. In particular it is clear that the main wintering grounds are in northern California, the Willows and Tule Lake National Parks; data on ringing this species have been analysed by T. P. Shevareva (1959, 1961).

The second species of goose inhabiting the island is the Brent Goose *Branta bernicla orientalis*. It was known previously that these birds nested here, but in much smaller numbers than *A.caerulescens* (for example, L. A. Portenko mentioned it in 1937). In 1964 large numbers of unmated, moulting Brent Geese were discovered, which had not been observed previously.

The birds nest, in single pairs and small colonies, in many parts of the island, principally in the large river valleys. The Brent nests are either in colonies of *A.caerulescens* or close to Snowy Owl nests. The birds' selection of nesting ground of a suitable colour is particularly striking. The nests are usually made on bare black or dark brown patches of earth or lichen. The bird itself, and in its absence the nest, thickly lined with dark brown down, are thus very well camouflaged. The times of

migratory arrival and commencement of laying are several days later than in the case of *A.caerulescens*. A fairly detailed survey of the island shows that the total number of Brent Geese nesting there in 1964 was at best 1,000–2,000 pairs.

We found gatherings of unmated Brent Geese in mid-July, in the intensive moulting period. During this period they congregated in flocks of several hundred birds on the shores of shallow lakes in the flat tundra in the northern part of the island. Among them were birds of at least two age-groups, judging by the plumage. It should be mentioned that four ringed Brent Geese were caught in one flock; all had been ringed in Alaska (Lower Kachunuk River), two males (1963) being marked as sub-adult, one male (1962) marked as adult and another bird, also ringed in 1962 without indication of age or sex. Judging by the dates of ringing (11th July–5th August), they had also been caught in Alaska during the moult. These finds are interesting for a number of reasons, although the data are insufficient for final conclusions.

The total number of moulting, unmated Brent Geese could be approximately assessed at not less than 10,000 birds.

References

PORTENKO, L. A. 1937. Birds of Wrangel Island. *Problemy Arktiki*, No. 3.

MINEEV, A. I. 1945. *Wrangel Island*. Moscow – Leningrad.

USPENSKII, S. M. 1963. *Chen caerulescens caerulescens*. *Priroda* No. 9.

SHEVAREVA, T. P. 1959. Data on migration of wildfowl nesting in the northern U.S.S.R. Symposium *Animal Migration*, published by the U.S.S.R. Academy of Sciences, Moscow.

SHEVAREVA, T. P. 1961. Migration of *Ch. caerulescens caerulescens*. Ringing and marking of animals. Information bulletin No. 1, Nature Conservancy Commission, U.S.S.R. Academy of Sciences, Moscow.

Shinhama - the Imperial Duck Decoy

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The Japanese duck decoy or *Kamoba* was evolved from the European type during the 19th century. The major difference is that in the Japanese form the ducks are caught individually with a hand net, which is regarded as a sporting activity and a social occasion.

Two such decoys are maintained by the Imperial Household, one on fresh, the other on brackish water. On a bright sunny day in October 1964 my wife and I were privileged to visit the brackish pool at Shinhama in company with Mr. Dudley Cheke – the British Minister – and Mrs. Cheke. The *Kamoba* lies just across the river Edo from Tokyo, no more than half an hour from the city, in a large area of paddy fields, and adjacent to the estuary mudflats. It was mid-morning as we approached but nevertheless there were springs of Teal and parties of Pintail and Shoveler flighting across the rice fields and the reedy pools surrounding the decoy wood. As we stopped the car to watch them we could hear the loud quacking of what were evidently, from the nature of the sound, a great many 'farmyard ducks'. We could also see large numbers of herons and egrets sitting in the tops of the trees surrounding the decoy. There turned out to be six species of these: Grey and Night Herons just like our own and four species of white ones – Great White, Plumed, Little and Cattle Egrets.

The rough track through the rice and lotus fields passed a tidal creek full of small boats and ended at a pair of large gates. A short drive of grey gravel led to an attractive reed thatched house – the headquarters of the decoy. Here we were met by the decoyman, a cheerful smiling man who offered us tea on a beautiful lawn overlooking a brackish pool of perhaps three or four acres fringed with bamboos. This was outside the decoy and empty of ducks. The only signs of life on it were some large fish which frequently jumped. Along the lawn was a row of artificially stunted pine trees completing a delightful Japanese scene. The decoyman brought out and demonstrated one of the hand nets which are the basis of the duck catching method – a rather large 'butterfly net' which was very light and beautifully balanced.

Briefly the principle of the *Kamoba* is that, as in European decoys, the ducks are perennially undisturbed on a quiet pool, surrounded by dense thicket. In this case additional attractions are a supply of millet seed, and the continuous quacking of 200 large 'farmyard' ducks. Radiating from the pool (or *tamari*) are a number of narrow vertical-sided ditches (*hikibori*) about 5 feet wide and 25 yards long, which bend sharply where they leave the pond and pass through the bamboo thicket. The rest of the *hikibori* is straight with a grassy space on either side and across the end of