

Observations on the Lesser Snow Goose Nesting  
Grounds, Egg River, Banks Island

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Lesser snow geese, Chen hyperborea hyperborea (Pallas) are the commonest of the subfamily Anserinae in the western Arctic, where also are found black brant, Branta nigricans; Canada goose B. canadensis; white-fronted goose Anser albifrons; and Ross's goose Chen rossi. Four local *nesting* areas of snow geese are distributed along 180 miles of the Arctic coast, on the deltaic islands south of Kendall Island, Cape Dalhousie, and the deltas of the Kugalik and Anderson Rivers. North and west of those, a fifth breeding area is located along the Egg River, Banks Island. Ground observations were made by the author on the Kendall Island nesting area in 1954 and on the Egg River nesting area in 1955.

The 1955 observations were made from June 23 to July 4 as part of a faunal study of Banks Island. During that period the processes of incubation, hatching, dispersal and predation were observed. Apposite features are used in this report comparing the Kendall and Egg River areas.

Description of the Egg River Nesting Area

The Egg River area, the largest of the nesting grounds mentioned, is located on both sides of the river (Fig. 1) where it joins Big River, about 16 miles from the west coast. The nesting area is six miles in length, averages 1.5 to 2 miles in width, and occupies an area of 10 to 12 square miles. No evidence of nesting was found outside of the area occupied in 1955. The nests were concentrated somewhat in the northern three-quarters of the area, and especially so on the east side of the river near the mouth.

The Egg River is a clear, shallow, braided stream with a gravel bed. Four miles south of its mouth, it divides into three branches. Four habitat types were found in the nesting area: wet mossy-grass on the western side, (Fig. 2); sparsely vegetated gravel flats and bars in the middle section; and sloping gravel shores and a gently-sloped bank of organic material along the eastern side. Shallow lakes are scattered throughout the area especially near the mouth of the Egg River and on its eastern side (Fig. 3).

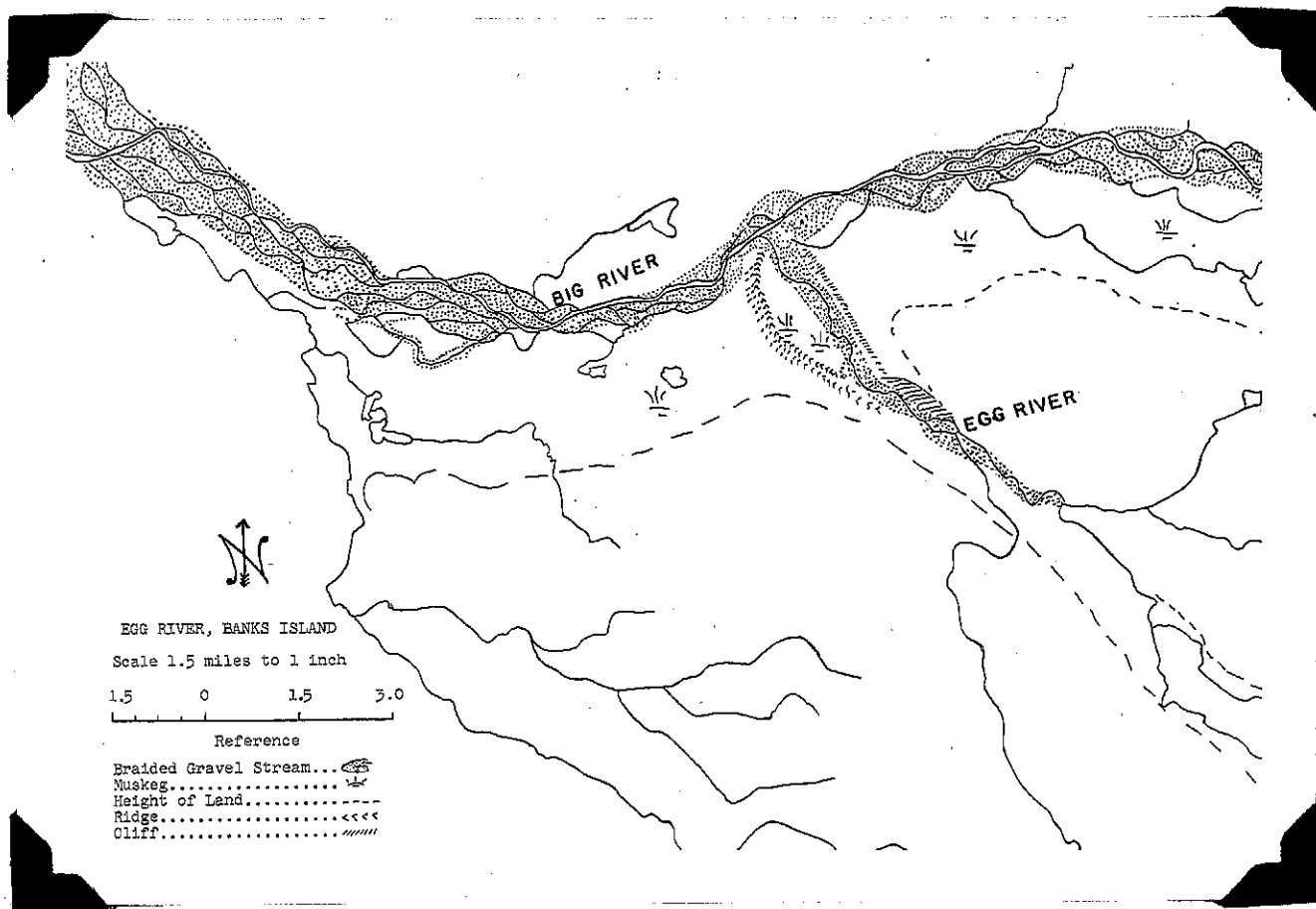


Fig. 1. The snow goose nesting area on the Egg River.

### Spring Migration

In 1955, the spring migration occurred from May 17 to June 4, approximately 20 days, reaching a peak on May 30. Hohn (1954) noted that the 1953 migration extended from May 18 to mid-June, with a peak on May 29. According to some Eskimos, the spring migration may be completed in a few days.

The spring route from the interior mainland to Banks Island is partially known. The Anderson River is the logical route to the coast, and in 1952 many goose feathers and droppings were found by the author along the river below the forks. Soper (1949) considered the large influx of lesser snow geese which occur for brief periods in the spring and autumn are migrants of the Banks Island population.

In 1955 the migration was observed at various points from Cape Kellett to Cape Lambton, a distance of 90 miles. The geese arrived in waves of small flocks. Some of them reached Cape Kellett and along the west coast from the direction of Baillie Island. Others reached Cape Lambton from the direction of Cape Parry, followed the west coast to the Masik River, and continued north towards the Egg River.

After arriving along the west coast of Banks Island, the flocks of geese rested and fed on the grassy coastal slopes and river banks. During the first part of the migration, flocks of geese were seen flying randomly along the coast and Sachs River. In late May, the geese tended to fly directly inland, following depressions or gullies between the ridges.

#### Nesting Data

Prenesting activities and associated behaviour were not observed, since the study did not start until June 23, four days before hatching commenced. Assuming an incubation period of 21 to 22 days (Manning, 1942; Cooch, 1954), egg laying was probably under way by June 6.

On June 24, the number of nests and eggs were counted in a strip from the west side northeast to the channel and southwest to the west side of the river. On June 27, a second transect was conducted along the west side from the camp south to the end of the nesting area. In Table 1, the frequency of occurrence of clutch sizes of 920 nests are given. The number of eggs per clutch varied from two to nine, averaging 3.88. On the deltaic islands the number of eggs in 186 nests, averaged 3.7, and ranged from one to eight (McEwen, 1954). On Southampton Island, Cooch (1954) recorded the average clutch size as 4.10 for 1,726 nests in 1952 and 3.97 for 1,300 nests in 1953. The reason for the lower average clutch sizes at the deltaic islands and Egg River, may be because the samples were smaller and their periods of exposure to predation

were longer.

Table 1.      Frequency of Occurrence of Eggs in 920 Nests

Sample Strip. No.	No. of Eggs	2	3	4	5	6	7	8	9	Total No. Nests	Total No. Eggs	Av. Clutch
1		63	246	302	127	36	22	2	1	799	3,102	3.88
2		3	42	52	19	3	1	1	-	121	468	3.87
Summary		66	288	354	146	39	23	3	1	920	3,570	3.88

The nests, in most cases, were constructed on previous nest sites and consisted of elevated heaps of organic material lined with down (Fig. 4). On gravel bars, they were down-lined depressions in the gravel. Nests were found in the crevices of polygons and organic deposits. Some nests were found near the top of a gravel ridge about 200 feet in height, others on a grass-sedge plateau, 50 to 150 yards from the river bank.

Hatching Data

The first evidence of hatching was observed on June 27. The average size of 419 broods counted between June 28 and July 3 was 3.33. Cooch (1954) reported that hatching occurred on Southampton Island from June 30 to July 10 in 1952, and from July 5 to 16 in 1953. In Table 2, six samples of brood counts are listed. Sample variation during the seven-day period was small. The counts were made from elevated positions along the river as the family groups moved freely out of the nesting area. The difference between the average brood size and clutch size was 0.55 per clutch. This loss occurred during the last stage of incubation and the first week of hatching. This calculation does not include egg losses during incubation or the complete loss of clutches.

Table 2      Number and Average Size of 419 Broods

Date	No. of Broods	Total No. Young	Av. Brood Size
June 28	21	72	3.43
29	32	100	3.12
30	35	113	3.23
July 2	93	308	3.31
3	111	377	3.40
3	127	416	3.28
Summary	419	1,386	3.33

### Dispersal from the Nesting Grounds

On the second day of hatching, adults and broods began leaving the area. The dispersal was in three directions - northeast from the east side of the river, northwest from the mouth of the river into Big River, and west-southwest from the west side of the river towards Lennie River. By July 3, the geese had almost completely deserted the nesting grounds. The largest number moved into the Big River flats. Snow geese accompanied by broods have been seen as far north as Storkerson Bay (Manning, 1956). From the Egg River, the geese dispersed towards the coast between the Lennie River and Storkerson Bay.

### Factors of Mortality

Forces acting to reduce the goose population included animal predation by Arctic fox (Alopex lagopus), wolf (Canis lupus), glaucous gull (Larus hyperboreus), parasitic jaeger (Stercorarius parasiticus), pomarine jaeger (S. pomarinus), and long-tailed jaeger (S. longicaudus); human predation, and adverse weather. The last-named is considered the most important control factor on the deltaic island, and possibly in certain years on the Egg River nesting areas. Animal predation appears to be the least important.

Arctic foxes were believed to be the most active and successful predators. From June 23 to July 4, 35 observations were made of foxes hunting on the nesting area. The largest number of foxes observed in one day was nine. On Transect 1, 42 <sup>or 4.8</sup> ~~or~~ per cent were destroyed by foxes, 32 or 3.7 per cent by unidentified agents, probably foxes and 799 or 91.5 per cent occupied. No data were available for transect number 2.

In Figure 5, a nest destroyed by a fox is shown. Such nests may be found empty or with egg shells scattered about. When a fox locates an unattended nest it usually takes an egg in its mouth and carries it with the ends protruding. It digs a shallow hole in the ground, deposits the egg in it, and pushes dirt over the egg with its nose. This operation continues until all the eggs are taken, or until the geese return and defend their nest. The fox often recaches eggs. One fox was observed to recache the same eggs three times in the same area during 30 minutes of observation.

The fox retreats when attacked by the gander or a mated pair.

Occasionally, fake attacks were made by a fox to flush a goose from the nest but this feigning act was never successful. Because of these observations, it is considered that the 26 geese whose carcasses were found partly consumed by foxes may have died from natural causes.

Unlike terns and gulls which are also colony nesters, the geese were not stimulated to group defense by the presence of a fox or other intruder. Each pair restricted its defense to its own nest or brood. Geese remained alert to the presence of a fox at a neighbouring nest but waited to attack it until it approached them. The foxes noted also worked independently of each other.

Wolf predation appeared to have very little effect on the goose population. Three single wolves were seen travelling amongst the nests without molesting the adults or their eggs. Adult geese showed fear of a wolf and took to flight, usually four to six feet above the ground. The wolf scat found consisted entirely of goose feathers.

Collared and Back's lemmings frequently observed near nests, were not considered predators. Lemmings which come too close to a nest are killed by the geese. Three lemmings were found which had been killed by geese.

The long-tailed was the commonest of the three species of jaegers. Thirty-nine of them were seen, as compared to one or two of the other species. Jaegers were continuously flying over the nesting area in search of food. Inland from the river two long-tailed jaeger nests with eggs in them were found. Predation by a jaeger can be identified by a small hole picked in the egg, usually with beak marks around the edge of the hole (Fig. 6). Seventeen eggs, or 0.54 per cent of the eggs counted, were destroyed by jaegers.

A colony of glaucous gulls nested on the area. No egg predation by gulls was observed. Downy young geese which stayed or lagged behind the brood were easy prey for the gulls. Only one instance of gull predation on a young goose was observed. Unhatched eggs and partially hatched deserted clutches also form part of the gull and jaeger diets. Cooch (1954) found that a total of 9.6 per cent of the eggs produced in 1952 and 1953 on the Southampton Island nesting ground were destroyed by avian predators. The amount of avian predation on the Egg River nesting ground was not determined.

The raven population on Banks Island was small. No ravens were seen on the nesting area.

Human predation was not a factor in 1955 because the R.C.M. Police detachment at Sachs Harbour enforced the regulation against spring hunting and eggng.

Unfavourable weather conditions such as an early spring thaw followed by severe cold in late May, prolonged wet rains with strong gusty winds, or flooding of the nesting area by a combination of high tides and gale winds at a critical phase in the life cycle can substantially lower the nesting success of goose populations. In 1955, climatic conditions were favourable but not ideal. Most of the snow on the land disappeared after an early thaw from May 15 to 20. The warm weather was followed by snowflurries for three days. The month of June, an important month which included the period of nesting, incubation, and hatching, was cold, with strong winds and snow. Up to June 21, rain or snowflurries, and strong winds prevailed along the west coast. The weather inland along the Egg River was probably just as severe. From June 23 to July 4, the temperatures remained above freezing, ranging from 1° to 16° C. A few geese succumbed when two days of strong winds accompanied by rain occurred during the hatching period. Two adults were found dead near their nests. One adult female was picked up in an emaciated condition and was destroyed. Two dead goslings and eight deserted nests, containing a total of 28 eggs, were found.

Unlike most goose nesting areas, the Egg River area is not likely to flood. The mouth of the river is beyond the influence of tidal-gale water flunctuations. Flooding has occurred on the deltaic islands of the Mackenzie and on the Anderson River delta, resulting in heavy nest destruction.

#### Population Estimates

Population estimates for the Egg River goose population vary from 15,000 (Smith and Sutton, 1952) to 120,000 (Manning, 1956). The aerial survey conducted by Smith and Sutton in late July along the west coast was limited by weather conditions and considered incomplete. Hohn (1954) estimated 30,000 geese nesting in the Egg River in 1953, but predicted a total of 100,000 in some years.

An attempt was made to get a total count of the geese nesting in the Egg River area by dividing the area into four sections and counting the geese in each section, using a 20x telescope and 6 x 30 binoculars, from elevated positions on the ridges along both sides of the river. On June 25, 7,329 geese were counted; on June 26, 12,960; and on June 28, 12,553. (No count was taken on June 27 because of unfavourable weather.) Hatching had commenced and a slight shifting of the geese on the area was noted, so the remaining section was not counted. However, the geese in that section were estimated at 8,000. The nesting populations thus totalled about 41,000. Possible sources of error were duplication of observations at long distances, movements of geese to and from the nesting area, birds hidden from view by depressions and elevations, and personal error. A possible nesting population of 100,000, suggested by Höhn (1954), is considered excessive as the total nesting areas were occupied in 1955.

Four blue geese paired with snow geese were seen. One of the blue geese was blue-bellied and three were white-bellied. Blue geese are rare in the Mackenzie Delta. None was seen on the Kendall Island nesting area in 1954. Four immatures were observed in the Egg River area.

Non-breeding geese were observed on the flats of the main rivers flowing to the west coast. A total of 8,350 were estimated, as follows: 50 at the Kellett River on June 7; 4,000 along the Lennie River on June 28; 300 west of the Egg River on June 23; and 4,000 on the north side of the Kellett River on July 7. Non-breeding and moulting geese were seen by Manning (1956) between Big and Storkerson Rivers, with a few as far north as 10 to 20 miles inland on the Thomson River. Without allowing for these groups the total population for the island is estimated at approximately 50,000. In a successful nesting season, producing an average of 3 young per pair, the potential production would be about 60,000 young. Thus the autumn population might be more than 108,000.

#### Autumn Migration

Discussion of the autumn migration from Banks Island to the wintering grounds in California must be limited to generalities because of the paucity



of data. Flocks of geese fly from the Big River flats and possibly Storkerson Bay about the end of August. Some Eskimos reported that flocks of geese have been seen flying over Booth and Baillie Islands. The migration passes over Tuktoyaktuk during the first week in September. It is uncertain whether the geese continue west into the Lower Mackenzie Delta or south along the east side of the Mackenzie River. About mid-September a large concentration of snow geese remains in the Lower Mackenzie Delta for about two weeks. These geese may be from the Kendall Island population or include some of the geese from Banks Island. One of the 300 geese banded on the Kellett River in 1955 was taken in the Delta at Shallow Bay, Y.T., an area of autumn concentration.

The remaining 13 band returns were from along the Central and Pacific Flyways as follows: Hay Lakes, Alta. (1), Oregon (3), Montana (1), Nevada (1), California (6) and Mexico (1). Geese banded at Tule Lake National Wildlife Refuge and the Sacramento National Wildlife Refuge, California, have been taken at Sachs Harbour, Banks Island. A greater number of band returns and observations of marked individuals are required before the routes of the spring and autumn migrations of these geese are known.



Fig. 2 A view showing the west side and the mouth of Egg River with Big River in the background.

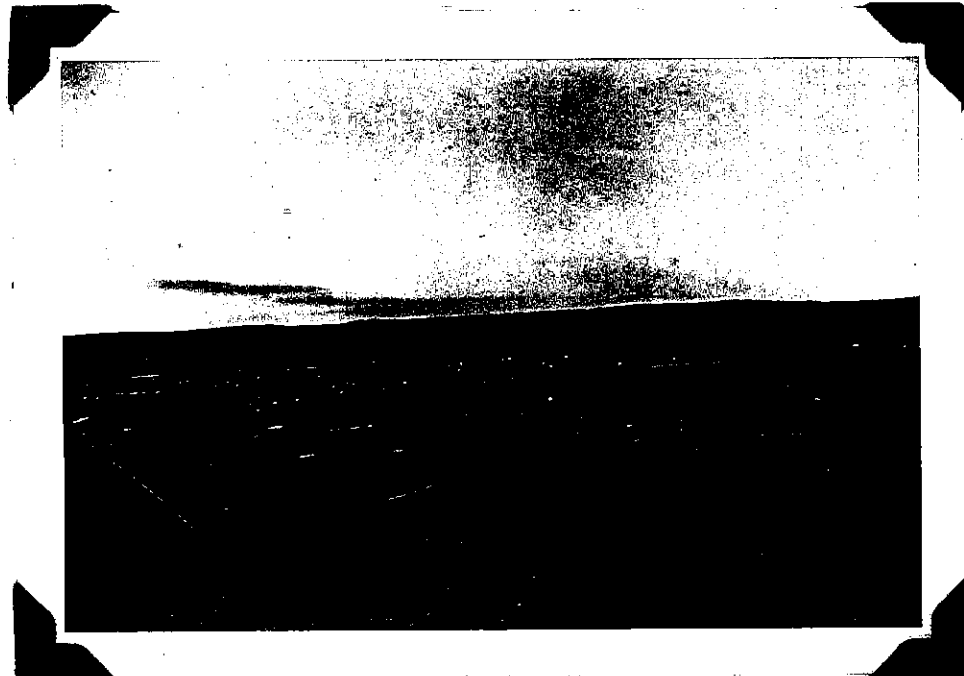


Fig. 3 A view showing shallow lakes and ponds on the goose nesting area.

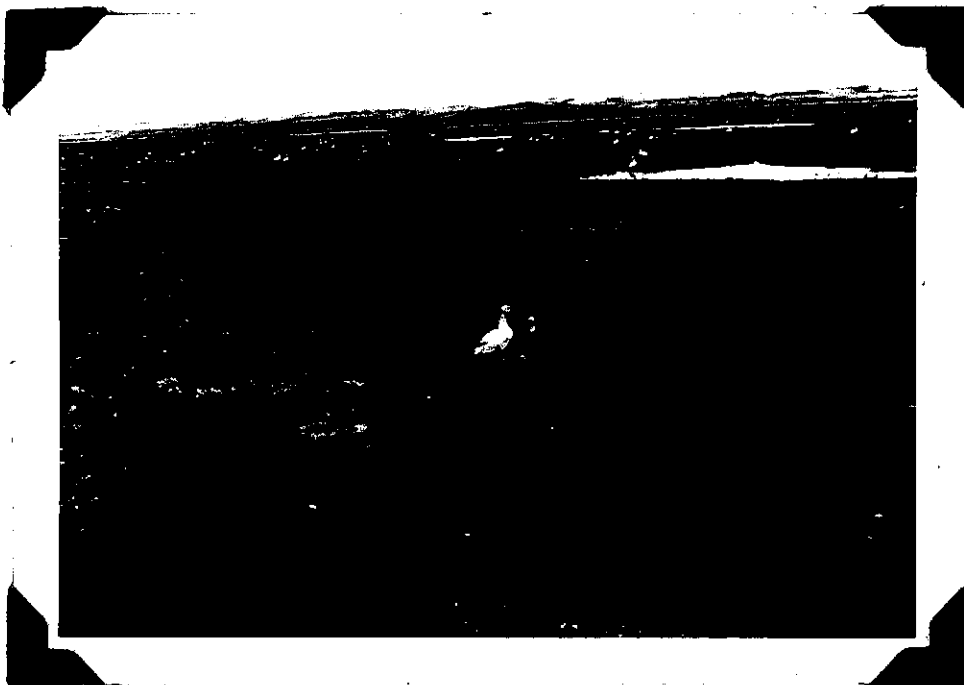


Fig. 4 Mid-section of the nesting area with elevated polygons of organic material, showing nesting sites and a mixed pair of blue and snow geese.



Fig. 5 Nest destroyed by an Arctic fox.

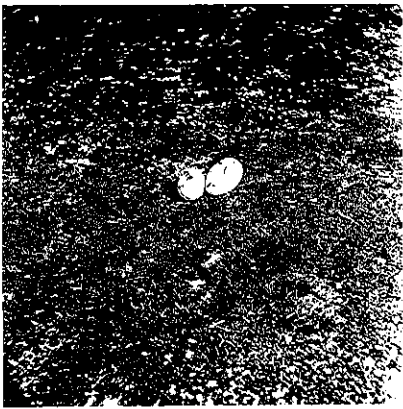


Fig. 6 Snow Goose eggs showing jaeger predation.  
The eggs have been picked open and the contents  
eaten by jaegers.