

OBSERVATIONS OF A NESTING COLONY OF AMERICAN BRANT

BY THOMAS W. BARRY

THE AMERICAN BRANT (*Branta bernicla hrota*), an important game species on the Eastern Seaboard, suffered great declines in the 1930's. For some time, the brant population has been known to fluctuate considerably from year to year. Presumably arctic storms on the nesting grounds cause declines in some years. Its numbers also have been reduced by encroachment of civilization, increased commercial navigation, oil pollution, over-shooting, and especially by the disappearance of eelgrass (*Zostera marina*), the bird's staple winter food. Cottam, Lynch, and Nelson (1944) reported that the American Brant population dropped in 1933-1934 to 10 percent of the 1930-1931 figure as a result of eelgrass destruction.

In the Boas River area of Southampton Island, NWT, in the summer of 1953, there existed approximately 700 nesting pairs of brant and 400 yearlings. This indicates a tremendous increase in the last two decades. Manning (1942) reported only two nests in 1934, and Bray (1943) saw eleven in 1936. This increase may have taken place at the expense of another colony, but perhaps comparative studies of other brant colonies in the Eastern Arctic will show a widespread increase in numbers.

I was able to study the 1953 brant colony on Southampton Island while accompanying F. Graham Cooch of Cornell University (now of Canadian Wildlife Service), who was studying Blue and Lesser Snow geese (*Anser caerulescens*). I wish to acknowledge the kindness of the Air Transport Service, RCAF, and the Department of Transport, Canada, for making the air trip possible.

The western coast of Southampton Island, facing on the Bay of God's Mercy, is a low, level tidal-plain tundra. The brant colony was centered in the mass of islands in the two-mile-wide delta of the Boas River and thinned out to the east and west for four and one-half miles. This brant concentration was entirely separate from the Blue and Snow geese which nested at least one-fourth mile inland from the high tide line. The area corresponded almost exactly to the brant nesting area described by Bray (1943).

The islands, averaging about one foot above high tide, were as small as six feet across and as large as two acres. They were covered with very short thick grass, sphagnum, or limestone gravel. Some were strewn with kelp washed in by fall storms.

Weather here was marked by strong and unrelenting winds and

by alternating periods of approximately seven days of sunshine and seven days of fog, rain, and snow. The highest temperature was 62° F on July 7, but the average was near 35° F in June and 45° F in July.

The brant were the last birds to return to the Boas River to nest. They began to arrive June 8, ten days earlier than the arrival noted by Sutton (1932). They flew in low over the bay ice from the east

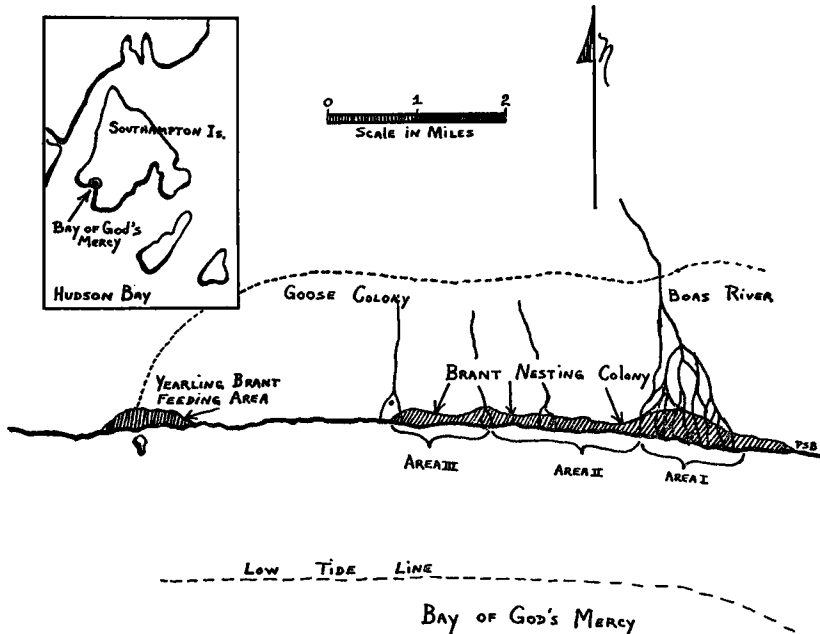


FIGURE 1. Sketch map showing the location of the Boas River brant colony, Southampton Island.

along the coast, or from the southeast from the direction of Cape Low. Probably they had followed the migration route described by Lewis (1937): passing the James Bay region after an overland flight from the Gulf of St. Lawrence, thence north along the east coast of Hudson Bay late in May, and branching off toward Mansel, Coates, and Southampton islands, north of Cape Smith.

The nearest Southampton landfall to Coates Island is Cape Low. Harry Gibbons, a Southampton Eskimo, told me that brant flew north past his camp at Gibbons Point (situated halfway between Cape Low and the Boas River delta).

From June 8 to June 13, brant arrived in small flocks of seldom more than 20 birds. Most individuals were in pairs on arrival. The

nest islands were still extensively covered with ice and water, and the brant congregated in run-off pools to await favorable conditions. As the islands cleared, pairs would leave the flocks and set up nesting territories. Unavailability of nest sites may account for the lateness of the brant arrival, compared with that of the Blue, Snow, and Hutchins geese (*Branta canadensis hutchinsi*) that arrived about 10 days earlier. Sabine's Gulls (*Xema sabini*) and Arctic Terns (*Sterna paradisaea*) also nested along the edge of the tide flats, and they, too, were among the last birds to arrive. The Eskimos said, "when nucklingnok (brant) is here, all are here." (See Phenology Chart.)

Since most of the brant arrived paired and ready to nest, little activity was observed that could be described as courtship. Sutton (1932) believed brant arrived unmated at Southampton Island, but he did not elaborate his theory. However, on June 17 and 20, I witnessed what appeared to be a courtship flight among the few brant that were unmated on arrival. My notes read: "Two birds appeared to be vying for position just behind and close to a third lead bird (female?). They skimmed fast over the water and islands, flying so low their long pointed wings seemed to touch the water. Then all three birds swooped up 50 to 75 feet, turned, and banked. During this maneuver, they winged over almost on their backs but always righted themselves without executing a complete roll. Then, with increased speed, they dipped low again and repeated the performance. At times they flew so close to each other that their wing beats seemed to hesitate for split seconds so as to avoid collision. Finally, at the top of one flight rise, the last one peeled off from the formation and left the other two to continue the tactics for a while."

The first nest, with one egg, was found June 16. Like the majority of brant nests in the study area, it was on a small island that was covered with a brown grass (probably *Puccinellia phryganodes*,—Polunin, 1940), very short and thick like that of a golf course green. The nest was a hollow in the ground, soupbowl shape, about 9 inches across and 2 inches deep. The permafrost was 4 inches below the nest at the time. The nest itself contained a sparse amount of grass that had been pulled up from within two feet of the nest. The amount of down in it was increased with each successive egg, until a thick, cohesive mat engulfed the clutch. The down was more luxuriant than that of the King Eider (*Somateria spectabilis*) that nested in the area.

The brants' techniques of nest defense appeared comic despite the seriousness of the birds' intentions. Territories were maintained by bluffing, rather than by out-and-out fighting—a marked contrast

to the knock-down tumbling battles of the Blue and Snow geese in their more crowded colonies. When an unwanted pair of brant invaded a neighbor's territory, the resident male and female set up a clamor of scolding "cronks" and poked their necks forward, bobbing their heads this way and that. This was followed by a charge. The defenders would thrust their long necks forward, holding their heads a few inches above the ground, and make a running dash at the intruders. One pair chased two other brant into the water in this way, and, continuing the escort, swam with their necks still extended and their heads about an inch above the water. In this manner they swam on either side of the trespassers for a distance of 60 feet until they came to a small island where the escort was discontinued.

During egg laying, brant remained within 100 yards of their nests, quite different behavior from that of the Blue and Snow geese which ranged much further from their nests during this period. Whenever a female brant left her nest, she covered the eggs with down.

Herring Gulls (*Larus argentatus*) and Parasitic Jaegers (*Stercorarius parasiticus*) were the most notable predators of brant eggs and young. The common practice of a jaeger was to let a gull rob the nest; then the jaeger robbed the gull. Jaegers also robbed nests directly. When jaegers or gulls appeared in the area, the brant flew quickly to their nests. They would then protrude their necks and heads in the characteristic fighting attitude and constantly maneuver to face the predators making passes at the nest. On one occasion, two jaegers set up a figure-eight flight pattern of attack on a pair of brant (a method similar to jaegers' attacks on gulls at a goose nest). The two brant stationed themselves on opposite sides of the nest, each facing one of the diving jaegers. Both remained on guard in this way until the marauders gave up.

Often during the incubation period I observed brant, presumably the males, fly at gulls and jaegers in attacks similar to those of Ruddy Turnstones (*Arenaria interpres*), Arctic Terns, and Sabine's Gulls. One brant put on a surprising display of speed and agility in chasing a jaeger through a sharp climb and several turns. Usually the brant took a good start and flew at a gull or jaeger, "cronked" a few times and then returned to the nest. On several occasions male brant flew up to meet a pair of trespassing neighbors and escorted them through the nesting territory.

When Polar Bears (*Thalarctos maritimus*) wandered through the nesting colonies the brant paid no attention. This was notable in view of the excited reactions of brant to gulls, jaegers, and humans. Snow Geese exhibited similar calm during intrusions by the bears. Apparently bears do not molest the birds.

Thirteen nests were found early enough to allow daily checks. The first egg was found June 16; the last on June 25, indicating a ten-day laying period. Generally one egg was laid each day, but in eight of the nests one day was skipped during the laying period. In five clutches, the skipped day occurred between the third and fourth eggs, and in the other three clutches, between the fourth and fifth eggs.

In the study area at the west end of the colony, 17 nests had a total of 75 eggs, an average clutch size of 4.41. Of these, eight eggs or young in two nests were abandoned when a sled dog ran loose in the area. The fate of the remaining 67 eggs was: sterile, 6; missing (presumably taken by gulls or jaegers), 4; abandoned nest, eggs or wet young, 5; young leaving nest under natural circumstances, 52.

Twelve nests were available for incubation checks. Counting from the day after the last egg was laid to the day of hatching as incubation time, 10 of the 12 nests required 24 days; one, 25 days; and one, 23 days. From 24 to 48 hours were required for all the young to hatch, dry, and leave the nest.

Once incubation began, the female made herself as inconspicuous as possible. She rested low and flat on the nest, stretching her neck out on the ground. On the islands strewn with dried kelp, she was difficult to discern.

The female generally remained motionless in this flat position until approached at 20 to 30 feet. She would then get up and walk away from the nest, calling repeatedly. At that point, the male would fly up and escort her away. They usually walked together 25 or 30 yards, calling and stretching their necks. Often they would then fly and circle back to the nest. I rarely saw a brant fly directly from the nest when disturbed.

When off the nest, the female fed and preened vigorously while the male stood guard. When re-approaching the nest, the female fed almost continuously on the short grass, bill pointed straight down and pulling grass rapidly. When within five feet of the nest, she went through the routine of picking up nest material and tucking it behind her—false nest building, false eating, and yawning.

The male usually ceased escorting the female when within 15 feet of the nest. Once the female was on the nest, the male would go off 50 to 100 yards to feed and watch.

Unlike some of the Blue and Snow geese, male brant were never observed standing closer than 15 feet from a female on the nest. Generally the male did stay close to the female while both were away from the nest or when predators were active.

Clutch sizes for the entire brant colony were taken from June 27

to July 1 when all egg-laying in the study area had ceased. Clutch size data are separated into three groups from three nesting areas. Area I, the Boas River delta islands, was also the center of Herring Gull nesting. Area II, just west of the delta, had fewer nesting gulls. Area III, $4\frac{1}{2}$ miles west of the delta was the western extremity of the brant colony and was my daily study area. There were no Herring Gulls nesting there.

In Area I, the average clutch size of the 119 nests was 3.77; in Area II, average clutch size of 67 nests was 4.21; in Area III, average clutch size of 17 nests was 4.41. Range and distribution was:

<i>Number of Eggs</i>	<i>Area I</i>		<i>Area II</i>		<i>Area III</i>	
	<i>Number of Nests</i>	<i>Total Eggs</i>	<i>Number of Nests</i>	<i>Total Eggs</i>	<i>Number of Nests</i>	<i>Total Eggs</i>
1	5	5	0	0	0	0
2	5	10	3	6	1	2
3	33	99	8	24	1	3
4	47	188	28	112	6	24
5	28	140	28	140	8	40
6	0	0	0	0	1	6
7	1	7	0	0	0	0
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	119 nests	449 eggs	67 nests	282 eggs	17 nests	75 eggs

It can readily be seen that the apparent mean clutch size increases as the colony spreads out toward the western limits. This could be influenced by several conditions: (1) crowding in the center of concentration on the river delta islands; (2) high water causing a later nesting and therefore incomplete clutches by June 27; (3) unequal number of nests sampled; (4) incidence of Herring Gull nests.

Without discounting the importance of the other possibilities, I believe the presence of Herring Gulls was the primary cause of smaller clutch. Manning (1942), describing gull activity in relation to Snow Geese at the delta islands in 1934, said: "Many herring gulls nest in the colony, chiefly on large glacial boulders. Whenever my passing disturbed a goose and caused it to leave its nest, a gull would swoop down to examine it, and, seeing the eggs, alighted close by. . . . That the gulls do account for large numbers of eggs was shown by the pecked ones scattered about the colony." This activity applied to the brant, which in 1953 were more numerous than during Manning's visit. Manning speculates that many of the pecked eggs may have been abandoned previously by the parent geese, but it was my experience with the brant, that the gull-destroyed eggs rarely had been abandoned.

In the river delta, I saw 50 Herring Gull nests, built prominently on granite boulders strewn about the area. The gulls raided the

brant and goose nests heavily. I watched a lone female brant stand guard over her nest as 15 gulls dove and screamed at her. The brant stubbornly refused to be driven off. When I inspected the nest there were only two eggs. She had lost her mate, and without help guarding the nest, her clutch had been vulnerable to frequent raids.

The first brant egg in the study area pipped July 11, and the last hatched July 21. Incubation time averaged 24 days. Brant with wet young or pipping eggs left the nest hesitantly at my approach. Because they had grown accustomed to me, the parent birds made no attempt to call off the dry young when I disturbed them. I watched one pair return to the nest after I went off some distance; the female settled down on the two dry young and three pipping eggs. But when disturbed by sled dogs, the brant hurriedly departed with those young that could walk and abandoned the others.

Many brant hatched and left their nests at the height of a storm of fog and wind-blown rain on July 18. They appeared to survive the foul weather without mishap.

As soon as the young were dry, the adults stood 10 feet or so from the nests, and, poking their heads and stretching their necks, emitted a long series of "cronks" that kept up five minutes or more. The young were led off to the outer edge of the mudflats, apparently to feed on larvae and small crustaceans. The parent birds would take positions at either end of a string of young and guide them. Several times I saw six or eight brant with 10 or 14 young swimming offshore at high tide, obviously several families flocked together.

Adult birds did not go into molt until the last ten days of July—about a week after the young had hatched. While molting they remained with their young along the tide line and in the tidal pools where food was plentiful and the water calm.

On July 15, the two sled dogs were loose after a Polar Bear and caused a pair of brant to abandon three of four young. The pearl-gray young were placed in a kerosene incubator. Three days later, another abandoned young brant was added. The four captives fed very well on chick starter pellets. When allowed to roam the camp area they fed on mosquitoes and larvae, short grass, and flowers of *Ranunculus*. They took to the water without hesitation and dove, swam, fed, and frolicked. Wild young observed at the same period appeared to be developing at a comparable rate. By July 30, the captives had pin feathers along the base and trailing edge of the wings. In the next two weeks they doubled their weight. On arrival at Coral Harbor they took a strong liking to the *Equisetum*

available there, and as a replacement for chick starter pellets, they fed on Red River cereal, and, to a lesser extent, on corn meal. Later, at Delta Waterfowl Research Station they ate the station's standard pellet ration, barley, and greens.

The non-breeding yearling brant returned to the colony with the adult breeders. However, they remained quite separate from the nesting flock. At about 6 A.M. each morning throughout the season, I observed some 200 brant, in flocks of 40 to 50 birds, flying west along the shore toward a feeding area 9 miles from the colony at the river. In the evening similar flocks would return. The Eskimo boys collected three birds from these flocks; all were yearlings. At the feeding area, I saw yearling brant eating the same type of short grass that covered the nest islands. No nests were found in this area; there was very little open water and no small islands like those further east.

By July 4, fewer brant were making the daily flight to the west. By July 10, the daily flights had ceased altogether as the yearlings had begun to molt. On July 24, far out on the tide flats I saw three yearlings that could fly again. From the vantage of a large boulder, I observed the large flock of yearlings in the bay by the river, where they had congregated for the molt.

Early in the season brant feed on tender grass shoots under the edges of kelp drift. Later, adult and yearling brant feed almost exclusively on the short grass found on their nesting islands. Stomach contents yielded nothing else. Young Blue and Snow geese also fed extensively on this grass. There is apparently no eelgrass growing in this area.

Although I left the brant colony August 3 and did no banding, the young should have been large enough to band by the end of the first week in August. The driving and corraling of flightless geese described by Cooch (1953) could be employed with brant to some extent, but the driving would have to be partly or entirely amphibious, depending on whether adults and young along the shore, or molting yearlings offshore are to be banded in numbers.

Sutton (1932) considered the Arctic Fox probably the worst enemy of Southampton Island brant, and he minimized the importance of gulls and jaegers. I found the opposite was true on my study areas, which were generally wetter than the areas Sutton observed. As mentioned before, gulls take heavy toll of brant eggs and young in the Boas River. Foxes are not a problem here, because they vacate the wet lowlands when the thaw begins. Hunting and egg collecting by Eskimos are negligible because of wide dispersal of brant nests

compared with the concentration of Blue and Snow goose nests, and because brant here at this time have a strong muddy flavor. At any rate, they do not resemble the savory meal brant affords when shot further south (Bent, 1925).

Of greater importance to brant management than protection from predation is improvement of food supply. While the species has been able to adjust somewhat to changing food conditions, the Report on Bird Protection of the A.O.U., 1939, reveals that Atlantic Brant are increasing as the once-threatened eelgrass regains lost ground.

Porsild (1932) states that *Zostera marina* occurs as far north as Cape Eskimo (Eskimo Point) and that it requires about 15° C to vegetate. The plant appeared to survive the action of ice in sheltered areas. It may well be worth investigating the possibilities of its succeeding off the mouth of the Boas River where the water may be warmed by waters flowing from the interior.

PHENOLOGY CHART

(First dates seen, with numbers)

1953, Boas River, Southampton Id., NWT, Canada

May 26	Our arrival—area 85 per cent covered with snow and ice	
	Willow (<i>Salix arctica</i>).....	catkins
	Herring Gull (<i>Larus argentatus</i>).....	20
	Whistling Swan (<i>Cygnus columbianus</i>).....	4
May 27	Sandhill Crane (<i>Grus canadensis</i>).....	1
	Snow Bunting (<i>Plectrophenax nivalis</i>).....	20
	Lapland Longspur (<i>Calcarius lapponicus</i>).....	50
May 28	Redpoll (<i>Acanthis flammea</i>).....	25
May 29	Lesser Snow Goose (<i>Anser caerulescens</i>).....	13
	Blue Goose (<i>Anser caerulescens</i>).....	1
	Hutchin's Goose (<i>Branta canadensis hutchinsi</i>).....	2
May 30	Sabine's Gull (<i>Xema sabini</i>).....	2
	Sanderling (<i>Crocethia alba</i>).....	2
	Red-backed Sandpiper (<i>Erolia alpina</i>).....	2
May 31	Ruddy Turnstone (<i>Arenaria interpres</i>).....	2
June 1	Red-throated Loon (<i>Gavia stellata</i>).....	1
June 2	Parasitic Jaeger (<i>Stercorarius parasiticus</i>).....	1
June 3	Horned Lark (<i>Eremophila alpestris</i>).....	2
	Red Phalarope (<i>Phalaropus fulicarius</i>).....	3
	Duck Hawk (<i>Falco peregrinus</i>).....	1
	American Pipit (<i>Anthus spinoletta rubescens</i>).....	1
	Pintail (<i>Anas acuta</i>).....	2
June 4	Raven (<i>Corvus corax</i>).....	1
	King Eider (<i>Somateria spectabilis</i>).....	9
June 5	Long-tailed Jaeger (<i>Stercorarius longicaudus</i>).....	1
	Pomarine Jaeger (<i>Stercorarius pomarinus</i>).....	2
	Black-bellied Plover (<i>Squatarola squatarola</i>).....	5

June 6	Golden Plover (<i>Pluvialis dominica</i>).....	1
	Knot (<i>Calidris canutus</i>).....	3
	Baird's Sandpiper (<i>Erolia bairdii</i>).....	2
	Glaucous Gull (<i>Larus hyperboreus</i>).....	1
	American Eider (<i>Somateria mollissima</i>).....	11
	Arctic Tern (<i>Sterna paradisaea</i>).....	4
	Semipalmated Plover (<i>Charadrius hiaticula</i>).....	5
June 8	American Brant (<i>Branta bernicla hrota</i>).....	18
	Iceland Gull (<i>Larus leucopterus</i>).....	1
June 10	White-rumped Sandpiper (<i>Erolia fuscicollis</i>).....	5
June 16	Semipalmated Sandpiper (<i>Ereunetes pusillus</i>).....	2

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*Department of Conservation, Cornell University, Ithaca, New York,
March 25, 1955.*