

Seabird Colonies and Distributions around Devon Island and Vicinity¹

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ABSTRACT. Nineteen glaucous gull (*Larus hyperboreus*) colonies, two Thayer's gull (*L. thayeri*) colonies, and three fulmar (*Fulmarus glacialis*) colonies were recorded during one intensive, and several short, aerial surveys around Devon Island in the summer of 1972. Observations were also made of distributions of seabirds at sea and at colonies on some adjacent islands (Dundas, Margaret, Baillie-Hamilton, and Cornwallis). Only 2 of the 29 colonies examined have been described previously. The great importance of Lancaster Sound to the present and future welfare of arctic seabirds is discussed.

RÉSUMÉ. Les colonies d'oiseaux de mer et leur distribution autour de l'île de Devon et dans son voisinage. Au cours d'une reconnaissance aérienne importante et de plusieurs autres plus courtes autour de l'île de Devon à l'été 1972, on a relevé dix-neuf colonies de Goéland bourgmestre (*Larus hyperboreus*), deux de Mouette de Thayer (*Larus thayeri*) et trois de Fulmar boréal (*Fulmarus glacialis*). On a aussi observé la distribution des oiseaux en mer et dans les colonies de quelques îles adjacentes (Dundas, Margaret, Baillie-Hamilton et Cornwallis). Deux seulement de ces 29 colonies ont déjà été décrites. L'auteur discute de la grande importance du détroit de Lancaster pour le bien-être présent et futur des oiseaux de mer arctiques.

РЕЗЮМЕ. Колонии морских птиц в районе острова Девон. В результате обследований с воздуха летом 1972 г. описаны колонии чаек (*Larus hyperboreus* и *L. thayeri*) и глупышей (*Fulmarus glacialis*) в районе острова Девон. Проводились также наблюдения распределения птиц в море и колоний на соседних островах (Дандас, Маргарет, Бейлли-Гамильтон и Корнуоллис). Только 2 из 29 обнаруженных колоний были описаны прежде. Обсуждается значение пролива Ланкастер для существования арктических морских птиц.

INTRODUCTION

Information on the occurrence, distribution, and numbers of seabirds in the Canadian High Arctic is very sketchy. Few northern studies have been directed towards seabirds, and those that have concerned them have either emphasized various aspects of the breeding biology of certain species at known colonies (e.g., Tuck 1960; Barry 1961; Macpherson 1961; Smith 1966a, 1966b) or else involved the cataloguing of information obtained during observations on seabirds seen at sea and ports of call (e.g., Duvall and Handley 1946, 1948). However, the present need is for the production of a complete inventory which will show the geographical distribution of colonies, diversity of species, and precise numerical estimates of colony sizes. The immediate objective of the Canadian Wildlife Service (arctic) seabird programme (see Nettleship 1973) is to identify critical seabird areas and to establish a baseline for the comparison of population changes

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over long periods. The information is essential for the assessment of the effects of human activities upon northern seabird populations and other components of the marine ecosystem.

In the present paper are reported the results of one intensive aerial survey made around the full coastline of Devon Island, Northwest Territories, and of several short flights along portions of the south coast made between 28 July and 3 August 1972. Additional observations were made of colonies located on some adjacent islands.

In the Appendix to this paper are given the results of some significant observations made along the north coast of Devon Island and adjacent islands in 1973.

METHODS

The census flight around the coast of Devon Island was made in a single-engined Otter aircraft from 1055 hours EDT, 1 August, to 0305 hours EDT, 2 August 1972. The survey consisted of following the coastline clockwise, usually at an altitude of about 500 feet and at an airspeed of approximately 90 knots. Continuous observations were made simultaneously by two observers located on the right side of the plane, one looking through an open window and one through plexiglas windows. Identifications of species, estimates of numbers and descriptions of habitat were made as the aircraft passed over each colony. Large colonies were usually passed over more than once. Birds observed on the sea or in flight away from colonies were also identified and counted, although where large concentrations of birds occurred, especially along the southeast coast, numbers were estimated only within certain orders of magnitude.

Some difficulty was experienced in distinguishing between glaucous gulls (*Larus hyperboreus*) and Thayer's gulls (*L. thayeri*) seen at a distance while flying or on the sea. However, at breeding sites determinations of species proved much less difficult, although it is possible that some colonies classified as consisting purely of glaucous gull contained small numbers of Thayer's gulls. Final determinations of species composition at large colonies can however only be accomplished by means of ground surveys. Furthermore, one or two colonies may have been missed, as not all inlets and fiords were thoroughly investigated; but the whole landscape was scrutinised at a distance through binoculars, and those areas with cliffs seemingly suitable for cliff-nesting species were investigated.

Other census flights were made by C.J. Jonkel and R.H. Russell in association with surveys of polar bear (*Ursus maritimus*). These flights were made in a Bell 206 helicopter along the south Devon Island coast from Cape Spencer east to Dundas Harbour on 1 and 2 August, and to Dundas Island, Margaret Island, and Baillie-Hamilton Island on 3 August 1972. Some seabird sightings were also recorded by S.D. MacDonald from a single-engined Otter along the south coast of Cornwallis Island and Baillie-Hamilton Island in late July 1972 on flights to Bathurst Island.

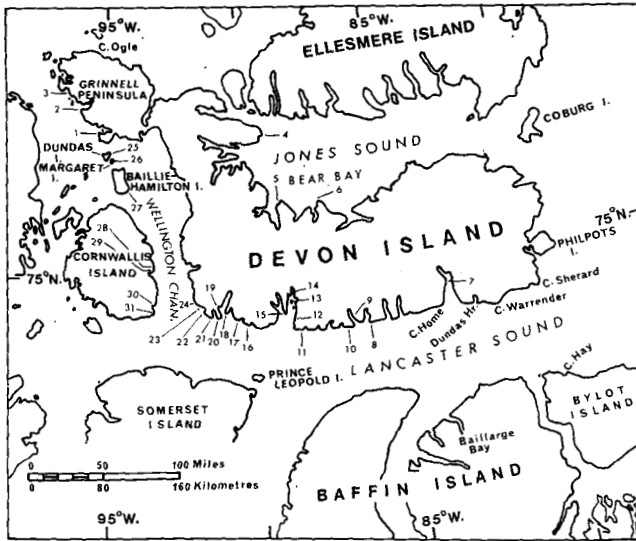


FIG. 1. Locations of nesting colonies of seabirds around Devon Island and vicinity.

RESULTS

Nesting colonies

Twenty-four active nesting colonies of colonial seabirds were found along the coastline of Devon Island in 1972 (Fig. 1). Only two of these colonies have been described previously: the fulmar (*Fulmarus glacialis*) colony at Cape Vera, at the west end of Jones Sound (Sverdrup 1904), and the glaucous gull colony on the east end of Beechy Island, off the southwest coast (Duvall and Handley 1948). The species composition, number estimates, and nesting habitats for each numbered colony (Fig. 1) are presented in Table 1.

The majority of colonies found around Devon Island were gull colonies; and of the 21 gull colonies seen only 5 were not located along the south coast in the ice-free Lancaster Sound region. Three of these were glaucous gull colonies located on cliff sites facing open water on the west coast of Grinnell Peninsula, and containing a total of about 36 breeding pairs; and the other two were in Bear Bay, with approximately 5 glaucous gull pairs near Skruis Point and 3 Thayer's gull pairs at Cape Svarten. Both of the latter two colonies were within easy sight and flying distance of open water. At least 314 pairs of glaucous gulls and 50 pairs of Thayer's gulls were nesting from Croker Bay west to Cape Spencer (Fig. 1). The total count of breeding gulls on the Devon Island coastline was therefore 408 breeding pairs, comprising 355 glaucous gull pairs and 53 Thayer's gull pairs. It is quite likely that this is an underestimate, since some colonies and pairs may have been missed owing to the irregularity of the coastline, the physical complexity of the cliff face, and the short time spent at any single colony. Gull colonies reported by Duvall and Handley (1946) at Dundas Harbour (mixed glaucous gull and Thayer's gull) and Hobhouse Inlet (glaucous gull) in the summer of 1946 were not found.

A group of 150 to 200 Sabine's gulls (*Xema sabini*) sighted on the north coast at Cape Ogle near a series of wet brackish coastal tundra ponds may have been

TABLE 1. Location and estimates of size of seabird colonies on the coastline of Devon Island and some adjacent islands in 1972.

Colony location	Latitude	Longitude	Number of pairs ¹					Remarks	
			F	GG	TG	K	BG		
BAILLE-HAMILTON ISLAND									
Washington Point (27) ²	75°46'N.	94°17'W.	+ ³				± 500	Cliff ledges (C. J. Jonkel and S. D. MacDonald) ⁴	
CORNWALLIS ISLAND									
Barlow Inlet (30)	74°45'	93°27'		± 20	± 10			Cliff ledges	
Cape Hotham (31)	74°41'	93°29'		± 10	+			Grassy-turfed cliff ledges	
Read Bay (29)	75°04'	93°30'		± 10				Cliff ledges	
(north of)									
Separation Point (28)	75°07'	93°29'		± 45			± 125	Cliff ledges	
DEVON ISLAND									
Beechy Island (23)	74°42'	91°50'		± 30				Grassy-turfed cliff ledges	
Burnett Inlet (8)	74°28'	86°03'		+				Cliff ledges (C. J. Jonkel)	
(east of)									
Cape Allard (2)	76°30'	96°13'		± 6				Grassy-turfed cliff ledges	
Cape Eardley	74°36'	90°26'		± 10				Bare rock cliff ledges	
Wilmot (17)									
Cape Liddon (20)	74°37'	91°13'	(4) ⁵					+	Expansive grassy-turfed cliff ledges
Cape Riley (22)	74°40'	91°39'		± 5					Cliff ledges (C. J. Jonkel)
(east of)									
Cape Spencer (24)	74°41'	91°57'		1					Bare cliff ledge
Cape Svarten (6)	75°37'	87°15'			± 3				Steep bare cliff ledges
Cape Vera (4)	76°14'	89°12'	(5)	+					Expansive grassy-turfed and steep bare cliff ledges
Croker Bay (7)	74°45'	83°18'		± 40					Most bare cliff ledges
Dyer Inlet (1)	76°17'	95°24'		± 10					Grassy-turfed cliff ledges
(south of)									
Gascoyne Inlet (21)	74°39'	91°22'		± 20					Grassy turfled cliff ledges
Graham Harbour	74°29'	88°17'		± 20					Grassy turfled cliff ledges
(west of)									
Hobhouse Inlet (10)	74°27'	86°53'	(5)	+					Expansive grassy-turfed cliff ledges
Hungry Bay (3)	76°38'	96°32'		± 20					Grassy-turfed cliff ledges
Maxwell Bay (12)	74°36'	88°34'		± 13	+			+	Grassy-turfed cliff ledges
(east coast)									
Maxwell Bay (13)	74°46'	88°36'		± 50					Grassy-turfed cliff ledges (C. J. Jonkel)
(island)									
Maxwell Bay (15)	74°39'	88°51'		± 30					Most grassy-turfed cliff ledges
(mid-promontory)									
Maxwell Bay (14)	74°49'	88°38'		± 25					Grassy-turfed cliff ledges (C. J. Jonkel)
(north end)									
Radstock Bay (18)	74°41'	90°55'		± 50					Grassy-turfed cliff ledges
(mid-promontory)									
Radstock Bay (19)	74°42'	91°12'		± 10					Cliff ledges on southeast side of rock stack
(west coast)									
Rigby Bay (16)	74°33'	90°08'		± 10					Grassy-turfed cliff ledges
(west of)									
Skruis Point (5)	75°39'	88°46'		± 5	+			+	Narrow grassy-turfed cliff ledges
(south of)									
Stratton Inlet (9)	74°31'	86°38'			± 50				Cliff ledges (C. J. Jonkel)
DUNDAS ISLAND (25)	76°06'	94°50'		± 100				+	Cliff ledges (C. J. Jonkel)
MARGARET ISLAND (26)	76°04'	94°48'		± 300					Cliff ledges (C. J. Jonkel)

¹ F = fulmar; GG = glaucous gull; TG = Thayer's gull; K = black-legged kittiwake; BG = black guillemot.

² Colony location on Figure 1.

³ Indicates species present and probably breeding, but number unknown.

⁴ Colony not seen by author, data from source given.

⁵ Order of magnitude (pairs): order 4 = 1,001 to 10,000; order 5 = 10,001 to 100,000.

breeding — a view based on the descriptions of nesting habitats of Gabrielson and Lincoln (1959) and Brown *et al.* (1967) — but no nests were identified. Only a ground check will accurately determine the status of this site.

The three fulmar colonies on Devon Island probably comprise a very high percentage of all fulmars breeding in the eastern Canadian Arctic. The Cape Vera colony, first discovered by O. Sverdrup on 11 August 1900 (Sverdrup 1904), consists of expansive grassy-turfed, and steep inaccessible bare-rock, cliff ledges extending continuously for about 5 miles (8.2 km.) (76°14'15"N., 89°16'30"W. to 76°16'30"N., 89°12'40"W.). No attempt was made to provide a precise estimate of the colony's size, but numbers within orders of magnitude place the

colony in order 5 (10,001 to 100,000 breeding pairs). However, the largest colony on Devon Island is probably the one on the south coast between Stratton Inlet and Hobhouse Inlet which is approximately 6.6 miles (10.1 km.) in length ($74^{\circ}28'00''\text{N.}$, $86^{\circ}58'40''\text{W.}$ to $74^{\circ}27'40''\text{N.}$, $86^{\circ}43'00''\text{W.}$). All the grassy-turfed ledges and crevices of the cliff face appeared to be occupied by nesting fulmars. The third fulmar colony on cliff ledges at Cape Liddon is relatively small, occupying some 2.2 miles (3.5 km.) of cliff ($74^{\circ}37'45''\text{N.}$, $91^{\circ}10'40''\text{W.}$ to $74^{\circ}38'20''\text{N.}$, $91^{\circ}03'15''\text{W.}$). There was no evidence of a fulmar colony at Cape Riley, first reported by an officer of the Parry Expedition of 1819-20 and listed as a tentative breeding location by Fisher (1952).

Seven new colonies were found and examined in areas adjacent to Devon Island (Fig. 1). Composition of species and estimates of numbers are given in Table 1.

Four of these colonies were observed along the south and southeast coasts of Cornwallis Island during the Devon Island census. At Cape Hotham only about 10 breeding pairs of glaucous gulls were counted, but small numbers of nesting Thayer's gulls were observed there on an earlier flight (S.D. MacDonald, personal communication). About 20 glaucous gull pairs and 10 Thayer's gull pairs were nesting together on steep cliffs on the north side of Barlow Inlet, and a few black guillemots (*Cephus grylle*) were also seen in the vicinity of the colony on another flight (C.J. Jonkel, personal communication). Further north, there was a glaucous gull colony of about 10 pairs north of Read Bay and a large mixed glaucous gull and black-legged kittiwake (*Rissa tridactyla*) colony at Separation Point. The kittiwakes at this colony were separated into two adjacent groups comprising a total of some 125 breeding pairs; about 45 pairs of glaucous gulls were also nesting.

Three colonies were found on other islands. There was a large kittiwake colony on Baillie-Hamilton Island at Washington Point (S.D. MacDonald, personal communication), estimated to contain about 500 breeding pairs (C.J. Jonkel and R.H. Russell, personal communications). A few glaucous gulls were also seen but nesting was not established. Two large glaucous gull colonies were found nearby on cliffs on Margaret and Dundas Islands. The number of gulls occupying these two colonies was estimated at 400 pairs (Table 1).

Seabirds at sea

Counts of seabirds sighted at sea along the flight route were made throughout the census. Away from colony locations around the west, north, and east coasts few birds were observed and these were, with one exception, glaucous gulls, usually single, flying over or sitting on the water. The exception was one black guillemot flying over the ice towards open water just south of Skruis Point.

On the south coast of Devon Island the situation was quite different. Fulmars, glaucous gulls, and Thayer's gulls were present in large numbers along the full length of the south coast, and were especially abundant from Cape Sherard west to Cape Home, on the west side of Croker Bay. A marked increase in numbers of birds seen at sea began at the south tip of Philpots Island, where large mixed groups of fulmars and glaucous gulls, totalling approximately 500 and 100 respectively of the two species, were observed on the water, presumably feeding. However,

the greatest concentration of birds, especially fulmars, occurred from Cape Sherard to Cape Warrender. In this region fulmars appeared as a continuous dense band, at least 3 to 4 miles (4.8 to 6.3 km.) wide, extending for about 30 miles (48 km.) along the coast. Fulmars were still very abundant from Cape Warrender to Cape Home, but density varied. The distribution pattern and density of birds made quantitative work impossible, but it is quite likely that close to 100,000 fulmars were seen. Three other species were also noted: some hundreds of glaucous gulls, small numbers of Thayer's gulls, and two flocks of ivory gulls (*Pagophila eburnea*). Twenty-five of the last-mentioned species were seen flying northward between Philpots Island and Cape Sherard, and eighteen others flying westward near Dundas Harbour.

West of Croker Bay small numbers of fulmars were seen continually all along the south coast, and north along the west coast to the edge of the ice in Wellington Channel. They were distributed rather unevenly, usually in groups of 10 to 100 birds, in a pattern which contrasted with the high-density pattern found east of Croker Bay. The estimated totals along this portion of the south coast were: fulmars, between 1,000 and 10,000; *Larus* gulls, between 100 and 1,000; one flock of 10 kittiwakes (Radstock Bay); one flock of 25 Sabine's gulls (near Cape Eardley Wilmot); and 23 black guillemots (east side of Maxwell Bay and on the sea at Cape Liddon).

DISCUSSION

Comparison with earlier information

The distribution of gull colonies found in the vicinity of Devon Island in 1972 cannot easily be compared with that of earlier times because of the scarcity of previous records. The breeding ranges described by Snyder (1957), Macpherson (1961), and Godfrey (1966) were based on observations made by Duvall and Handley (1946, 1948), who located only three glaucous gull colonies (Beechy Island, Hobhouse Inlet, Dundas Harbour) and one Thayer's gull colony (Dundas Harbour) on the south coast. The records of these observers are necessarily incomplete since they seldom approached the coast except near ports of call. It is possible that gull populations in the north have experienced increases in numbers similar to those of gulls in more temperate latitudes (e.g., Kadlec and Drury 1968a, Harris 1970), but the scanty information from the past and the short time interval between reconnaissances make it seem more reasonable to conclude that many of these 'new' colonies may be old sites which remained undetected until the present. At Beechy Island there is a fairly accurately-counted colony common to both surveys; there the number of glaucous gulls nesting has remained stable between approximately 25 pairs in 1947 (Duvall and Handley 1948) and approximately 30 in 1972. The fates of the colonies at Hobhouse Inlet and Dundas Harbour are not known, and require further investigation; it is possible that they were missed in 1972.

The history and status of the fulmar breeding sites on Devon Island are no less obscure. At Cape Vera, nothing is known about changes in numbers of the breeding population since its discovery by Sverdrup (1904) in 1900. There are

however, some interesting points to be made concerning the fulmar colonies on the south coast. Duvall and Handley (1946) saw fulmars "... flying about a high cliff as though they might have nests, but none were observed to alight". It would therefore seem that they detected the edge of the present colony which extends into Hobhouse Inlet, but were unaware of how close they were to perhaps the largest fulmar colony in the Canadian Arctic. The circumstance demonstrates the difficulty of detecting colonies from large boats — because of the distance from shore that such craft must travel, or the physical properties of high cliffs as viewed from sea level (i.e., irregularity of face and difficulty in viewing tops of protruding ledges and other nest sites) — and underlines the utility of aerial surveys in their detection (see Kadlec and Drury 1968b). The fulmars breeding at Cape Liddon went undiscovered even though that region of the south coast is extremely well known. The explanation that such colonies are new and did not exist earlier is not very plausible, because there is no evidence to suggest that fulmars in arctic waters have increased in numbers (Salomonsen 1965); and it is moreover difficult to believe that recently-started colonies could have grown to such a size in view of the rate of increase shown by boreal nesting fulmars (Fisher 1952, Salomonsen 1965). It seems more likely that these colonies have been in existence for a long time, but have gone unnoticed.

Lancaster Sound: a key area for seabirds

There can be no doubt from the distribution pattern both of colonies and of seabirds at sea around Devon Island, and the locations of the other large colonies of fulmar and thick-billed murre (*Uria lomvia*) known in the region (Prince Leopold Island: Barry 1961; Baillarge Bay, north Baffin Island: Hørring 1937, Fisher 1952; Cape Hay, Bylot Island: Tuck and Lemieux 1959, Tuck 1960; Coburg Island: Tuck 1960) that Lancaster Sound is a most important feeding area. It is probable that four of the six major fulmar colonies known in the Canadian Arctic use these waters for feeding, which suggests that they have a high productivity; large arctic fulmar colonies are known generally to occur in plankton-rich areas (Palmer 1962). It also seems probable that the areas where the greatest concentrations of fulmars were observed on the sea in Lancaster Sound had the highest plankton densities. The greatest concentration actually occurred on the southeast coast of Devon Island where the combination of converging currents and run-off from glaciers produces considerable upwelling and enriching of the sea (see Apollonio 1973). Similar relationships between fulmar numbers and plankton densities have been found by Kuroda (1960) in the north Pacific and by Rees (in: Brown 1970) on the Newfoundland Grand Bank. The Lancaster Sound area also appears to be attractive to marine mammals, especially white whales (*Delphinapterus leucas*), narwhal (*Monodon monoceros*), ringed seals (*Phoca hispida*), walrus (*Odobenus rosmarus*), and polar bears.

All this indicates that Lancaster Sound is vital to the welfare of these marine species and that economic development, especially in the form of oil drilling and transportation, should be strictly controlled in order to prevent the destruction of a uniquely rich high arctic oasis. To harm it would go far towards making a desert of arctic waters.

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APPENDIX

On 6 August 1973 a colony of black guillemots was discovered by the author on the steep bare-rock cliffs at Skruis Point which extended southward almost continuously for about 14 miles (22.5 km.) (75°41'N., 88°45'W. to 75°32'N., 88°13'W.). The size of the colony was estimated to be between 5,000 and 10,000 breeding pairs, and it is probably the largest black guillemot colony in the Canadian Arctic. Sverdrup (1904) reported "... thousands upon thousands ..." of black guillemots nesting in the steep mountainside near Baadodden (Boat Point) — about 30 miles (48.3 km.) northwest of Skruis Point — in 1900, but this colony was not found in 1972 or 1973. It is possible that Sverdrup's observations refer to the Skruis Point colony.

Further details of the 1973 observations are given in Table 2 below.

TABLE 2. Observations of additional seabird colonies on the northcoast of Devon Island and some adjacent islands on 5-6 August 1973.

Colony location	Latitude	Longitude	Number of pairs ¹		Remarks
			GG	BG	
DEVON ISLAND					
Cape Skogn (southwest of)	75°42'	84°22'	± 15		Grassy-turfed cliff ledges
Cape Newman Smith	75°39'	84°54'	± 2		Low bare cliff ledges
Cape Svarten (southeast of)	75°35'	87°07'		(2) ²	Steep cliff crevices
Cape Svarten (west of)	75°36'	87°22'	± 2		Bare cliff ledges
Nookap Island	75°35'	87°37'	± 5		Bare cliff ledges
Nookap Island (southwest of)	75°30'	88°06'	± 5		Cliff ledges
Skruis Point (and southeast peninsula)	76°36'	88°30'		(4)	Colony occupies about 14 miles (22.5 km) of steep cliff
Sandspollen (south side of)	76°08'	90°06'	± 15	+ ³	Cliff ledges on south side of rock stack
St. Helena Island	76°16'	89°10'	± 40	(3)	GG in 2 colonies on cliff ledges
CALF ISLAND	76°28'	89°30'	± 35	(4)	GG in 3 colonies on cliff ledges; BG colony around full coastline in steep cliff crevices
NORTH KENT ISLAND					
southeast tip	76°30'	89°42'		(3)	Steep cliff crevices
southeast coast	76°32'	89°49'		(3)	Steep cliff crevices
Skred Bay (south of)	76°38'	89°52'		(3)	Steep cliff crevices

¹ GG = glaucous gull; BG = black guillemot.

² Order of magnitude (pairs): order 2 = 11 to 100; order 3 = 101 to 1,000; order 4 = 1,001 to 10,000.

³ Indicates species present and probably breeding, but number unknown.