

LOCAL DISTRIBUTION OF EASTERN CANADIAN
ARCTIC BIRDS¹

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Plate 2

COMPARATIVELY few naturalists have a clear conception of the manner in which birds are locally distributed in the Arctic regions. To many, the polar lands are synonymous with a poverty of terrestrial life. While this circumstance admittedly holds for numerous localities, it is very far from being true for all. In reality, the abundance of birds varies enormously from place to place and frequently a maximum degree of contrast obtains within very narrow limits. The truth is, indeed, that many favorable sections throughout the polar lands display a wealth and diversity of bird life well beyond the budding Arctic ornithologist's most sanguine expectations.

Some of the most spectacular aggregations of Arctic birds are to be found on coastal islands and cliffs of the mainland. These include colonies of King and Northern Eiders, Mandt's Guillemots and Brünnich's Murres (vernacular names follow the American Ornithologists' Union 'Check-list of North American Birds,' 1931, which will make unnecessary the addition of scientific terminology). Particularly notable in coastwise cruising are the breeding rookeries of Herring, Glaucous, Thayer's and Kumlien's Gulls, where the white plumage of thickly massed adults gleams in startling relief against the dark rocks of the towering cliffs. Another sight which once seen, can never be forgotten, is that of swarming multitudes of Dovekies on the icy waters and mountainous nesting acclivities of northwestern Greenland.

Aside from these highly localized colonies, the best breeding areas of a host of birds are to be found on flat, grass-tundra lands in various parts of the Canadian Arctic islands. Such areas of marked extent are relatively few and far between. In the eastern Arctic the best examples are to be found in southern Southampton Island, southwestern Baffin Island, the vicinity of Pond Inlet, southwest Bylot Island, and apparently, also, parts of western Ellesmere Island. The best development of grass tundra is found over horizontally bedded sedimentary rock. Where this is boggy and sprinkled with ponds and small lakes, the breeding population of birds reaches the peak of abundance. As a rule such tracts are practically at, or relatively close to sea-level, and in the geologically recent past were below it. The greatest of these known resorts in the eastern Arctic occurs in northern

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Foxe Peninsula and north along the Foxe Basin coast nearly to Hantzsch River and east to Nettilling Lake. The estimated total area of these plains approximates 8,100 square miles. Additional sections of noteworthy extent flank the eastern sides of Amadjuak and Mingo Lakes at a somewhat greater elevation. As an all-round breeding territory these western and south-central plains of Baffin Island are of a very superior order. The grass-tundra plain bordering Foxe Basin on the western side of the island, especially, is visited by vast numbers of geese, brant, waders and Eider Ducks, which either breed locally, or pass on to more northern latitudes. It was in this lowland region at Bowman Bay, incidentally, that I witnessed the passage of untold thousands of Blue and Lesser Snow Geese in the spring of 1929 and later in the season, discovered the main breeding grounds of the former species.

A great part of this western Baffin Island territory is of extraordinary interest and fascination to a naturalist. Unfortunately, it is not of easy access and to enter it at the season of migration and nesting, one is obliged to winter in the country and travel by dog teams with the Eskimo before the snow melts the following spring. These vast coastal plains are not only unusual as to migration, but are equally remarkable as breeding grounds for many birds. Dominant among the larger forms are Blue, Lesser Snow and Hutchins's Geese, King Eiders, Old-squaws, Parasitic and Pomarine Jaegers, Red-breasted Mergansers, Common, Pacific and Red-throated Loons, and Herring Gulls. Sabine's Gulls and Willow (White-shafted) Ptarmigan also occur in large numbers, especially as migrants. Two other members of the summer avifauna are Whistling Swan and American Brant, though they are uncommon and widely scattered. Among the smaller species the grass tundra is particularly rich in nesting Lapland Longspurs, Red Phalaropes, White-rumped, Baird's and Semipalmated Sandpipers, Black-bellied and Semipalmated Plovers. During migration the country teems with tens of thousands of Purple Sandpipers, all but a few of which leave for more northern regions. Other species which occur in lesser numbers are American Golden Plover, Red-backed Sandpiper and Ruddy Turnstone. In the light of present knowledge these plains, at large, stand in a class by themselves; avifaunally rich as they are in summer, they are especially notable for a line of migration which, for concentrated volume and persistence, probably has no counterpart in the whole of the eastern portion of the Canadian Arctic.

Another exceptionally fine bird locality was found at Nuwata, Foxe Channel, in late August, 1928. Nowhere, after four seasons in the eastern Arctic, had I formerly observed such an assembled wealth of bird life in a single district. There was an astonishing aggregation of various species of shorebirds and Arctic Terns, together with gulls, jaegers, divers, King

Eiders, Old-squaws, Hutchins's Geese, Lapland Longspurs and other birds. Some of these species, it is true, were then gathered in large flocks ready for departure from the country, but the Eskimos said that for the majority, the local coasts and adjoining lowlands were favorite breeding grounds. It would undoubtedly well repay a naturalist to explore this district during the nesting season. He would normally be obliged to voyage to Foxe Peninsula the previous year, winter at Cape Dorset, and then leave by sled in May for the Eskimo village at Nuwata. With headquarters camp at this point, the pool-sprinkled grass tundra in the vicinity could be thoroughly investigated and work carried farther afield to include the chain of promising lakes which occurs in extensive lowlands on the Foxe Basin watershed southeast of Cape Dorchester. The locality appears to lie on a markedly important migration route that extends to and from the Foxe Basin lowlands via Nuwata and Hudson Bay. Further supporting this supposition is the fact that no pronounced movement of the Limicolae, especially, has ever been observed along the south coast of the island.

Along Hudson Strait the Common Canada Goose resorts to a modified habitat of the grass tundra as found localized in rocky terrain near the sea, or in adjacent coastal valleys. It occupies this coast to the exclusion of Hutchins's Goose from Cape Dorset to at least Icy Cape, while the latter only is found nesting along Foxe Channel and Basin. Several species, including White-rumped, Baird's and Semipalmated Sandpipers and Lapland Longspur, breed in isolated tracts of grass tundra in hilly and mountainous districts, but they are always scarce in comparison with the population habitually domiciled on areas of equal size in great, uninterrupted lowland plains, such as those along the west coast of Baffin Island. Common residents of the grass-tundra districts, interspersed with rocky ridges, are Snow Bunting, American Pipit, Horned Lark and Rock Ptarmigan. They are invariably associated with granitic areas and are therefore absent in the wide, swampy tundras, except for sporadic companies during migration. Where isolated granite ridges protrude from these plains, however, a few pairs will be found nesting. In the lower Pre-Cambrian tracts with good to fair plant cover, the bunting and pipit are of almost universal distribution. The Horned Lark, on the contrary, exhibits marked variability in numbers from district to district; in the Nettilling Lake territory, for example, a greater abundance was displayed than seen elsewhere in the eastern Arctic islands.

Of all the species which nest at the lower elevations, the King and Northern Eiders congregate in the densest colonies. These are apparently always on low-lying islands near the coast, though small groups, or scattered pairs of both species, nest on swampy ground about freshwater lakes in coastal areas, or on islands therein; they breed as well on the major grass tundras

in the vicinity of Foxe Basin, but in greatly reduced numbers. Coastal nesting islands, while very rocky, are usually well furnished with lowly vegetation and are nearer to typical grass tundra than to the impoverished granitic areas which may be referred to as desert tundra. A notable feature in respect to these two species of ducks is that ordinarily their nesting areas are distinctly separated. Among off-lying islands along substantial lengths of seacoast, the Northern Eider may be seen in extraordinary abundance, where the King Eider is totally absent, while the contrary phenomenon holds in another district. Occasionally, and to a very limited extent, the local breeding ranges of the two overlap, but in their home life they nevertheless remain meticulously segregated. The Northern Eider, in particular, is extremely gregarious. It is especially abundant locally along the south coast of Baffin Island and in Cumberland Sound, while *spectabilis* is predominant along Foxe Channel and Basin.

Hitherto, the distribution of bird life has been considered for areas referred to as the grass tundra, where for most species optimum breeding conditions obtain. Next in order is the desert tundra, which in relation to the preceding is highly differentiated. It is rocky and chiefly barren, though impoverished examples of higher plants persist as cushion, or mat types, separated by terrain that is either bare or scantily clothed with lichens. This type of country is found mainly on well-elevated areas, such as the larger hills, and intermediate and higher slopes of mountains; it also frequently occurs on rocky outcrops and ridges only a few hundred feet high where peculiarly rigorous climatic conditions exist. In most Arctic regions the desert tundra is represented by areas of much greater extent than those occupied by the flat grass-tundra lands which were earlier discussed.

The desert-tundra type of country is poor in bird life over all interior areas. In fact, certain tracts are almost devoid of birds of any kind. Snow Bunting, American Pipit and Horned Lark are the species which are most likely to be encountered. All three nest sparingly in these more inhospitable wastes, but they are more commonly distributed over rocky territory in close relationship with meadows and grassy valleys among the hills. The same may be said of the Rock Ptarmigan; it is found inhabiting country varying greatly in elevation and general character, though superior numbers naturally inhabit lower levels where berries and other food are more plentiful. Other widely dispersed inhabitants of the desert tundra are White Gyr Falcon, Duck Hawk, Snowy Owl and Northern Raven. Greater and Hornemann's Redpolls range over widely diversified terrain during migration, but are not positively known, as yet, to nest anywhere in the Canadian Arctic islands. The Greenland Wheatear is one of the rarer Baffin Island birds and has only been observed in the mountainous eastern side of the



GRASS TUNDRA: FOXE BASIN



DESERT TUNDRA: BAFFIN ISLAND

island where desert tundra predominates in association with small representations of grass tundra.

From an ornithological viewpoint, inland tracts of desert tundra are of a highly impoverished character and will invariably be found disappointing. Very often hours of active travel afoot will reveal no more than a few buntings and pipits which, in any event, are apt to be met with in the most desolate and forlorn tracts of the polar lands. Pre-Cambrian rock country of the desert-tundra type is particularly pronounced along the ice-fettered coasts and occupies enormous areas. Land birds will always be found scarce here except in sheltered valleys and even there will be restricted to very few species of moderate numbers. The most conspicuous members of the coast avifauna are various species of sea-fowl; it is obvious that such birds while extracting their living from the sea are otherwise essentially independent and many nest in the most desolate situations imaginable on adjacent land masses.

Mandt's Guillemots, for example, resort to very barren and precipitous islands of Pre-Cambrian rock on which to breed. An indispensable feature is the presence of talus slides at the base of cliffs near the sea where the nests are hidden away among the boulders. This imposes a highly restraining influence on general distribution. Some sectors are so attractive for nesting that multiple colonies become established on numerous islands in a comparatively small area, while, again, long stretches of coast may be entirely devoid of them, except for small scattered bands of non-breeders. On islands carrying a wealth of boulder débris, the birds swarm in astonishing numbers. On low, featureless coasts such as upper Foxe Channel and Foxe Basin, in southwestern Baffin Island, the species is scarce, or entirely wanting.

Among this class of birds, Brünnich's Murres assemble in the most amazing abundance. Colonies are highly localized, and like gulls, gannets and auks, these birds nest on ledges of rocky cliffs overlooking the sea. Apparently few situations meet the species' requirements in every respect, as rookeries in the eastern Arctic are infrequent and widely separated. The best known is at Cape Wolstenholme, Hudson Strait. Decided by the prevailing geology of the region, most nesting haunts occur on cliffs of Pre-Cambrian rocks, but considerable numbers breed on ledges of Ordovician limestone at Akpatok Island, Ungava Bay. On Eskimo testimony, there are large nesting colonies in the Merchants Bay region. It is also evident that important breeding sites occur somewhere about Bylot Island, as in August, 1923, tens of thousands of murres were observed among scattered pan-ice along the northern coast of the island.

Many islands chiefly occupied by Eider Ducks also support assemblies of Herring, Glaucous, or Kumlien's Gulls, occasionally all three nesting

together on a single cliff. In such cases a portion of the island is high and steep, with rugged lowlands; elsewhere, comparatively well carpeted with vegetation. As a rule, the islands inhabited by gulls are so steep, barren and rocky that all other species are excluded except, perhaps, for scattered pairs of American Pipits and Snow Buntings. Islands of this nature are to be unreservedly placed in the category of the desert tundra. On a high percentage of these, the lowly plant growth is notably depressed as a result of exposure; milling field-ice commonly surrounds such islands until early July or later, long after Eider Ducks and gulls begin to nest.

While in many instances gulls of different species nest sociably together, they are also as frequently found breeding separately in colonies varying greatly in size. The most conspicuous of these are located on cliffs of the higher mainland that rise above the sea, in many instances, to heights of from 500 to 1000 feet, or even more. Such nesting sites are usually desolate in the extreme, but occasionally a lush growth of grasses develops on the nesting ledges and in adjoining rock crevices. While the various species of gulls have a wide breeding range, there are often long lengths of seaboard in which no colonies occur. Unlike Glaucous and Kumlien's Gulls, the Herring Gull nests widely on rocks in lakes and rivers of the lowlands, a habit which, if anything, is more characteristic of the birds than rearing their young on cliff ledges above the sea.

In addition to the two floro-topographic types of country previously mentioned in relation to bird life (grass tundra and desert tundra), there is another of very considerable coverage, which may be called the polar desert. This embraces the polar lands which are dominated by glaciers and ice-fields. In southern Baffin Island the only example is the Grinnell Glacier. In the high mountains of the central part (5,000-8,000 feet) there are numerous fields of perpetual ice and snow, while glaciers are common along Navy Board Inlet. The eastern side of Ellesmere Island is especially characterized by enormous accumulations of land ice. Such areas are, of course, entirely destitute of breeding birds and may be disregarded in a further discussion of Arctic avifauna. The polar desert together with the desert tundra occupies, by a considerable margin, the greater part of the Arctic land mass. There remains, therefore, only a minor portion (represented by grass tundra and less inhospitable parts of the desert tundra) which is suitable as a habitation for the majority of species that reproduce in the polar regions.

A feature to be particularly emphasized, in this connection, is the notable difference in the abundance of breeding birds as between hilly and mountainous sections of the Arctic on the one hand and lowland grass tundra on the other. On the whole, the latter areas in season teem with bird life. In the former, aside from local colonies of sea-fowl along the coasts, compara-

tively few species and individuals will be seen; as a rule, these will comprise only widely scattered passerines, Semipalmated Plover, Rock Ptarmigan and Northern Raven. Practically, if not entirely absent over the greater part of these rocky sectors of the desert tundra, will be geese, nearly all waders, Sabine's Gulls, Willow Ptarmigan, jaegers and other birds which are abundant as breeders on the grass tundra and especially those portions in close proximity to the sea.

From the foregoing remarks, it will be appreciated that a naturalist's larger success, and point of view concerning Arctic bird life, will be governed to a marked extent by his chances of reaching the various types of country which have been mentioned. This is especially true in regard to the scattered and localized breeding colonies of sea-fowl along the coast, and the great nesting areas of numerous species on the flat grass tundras; the latter, as a rule, are particularly isolated and infrequently seen. To reach these areas special side journeys are usually required away from the main routes of travel and for the best results, weeks in advance of the time that ships can approach the Arctic coasts. For this reason, late summer and fall expeditions to the Arctic regions, with a high percentage of the time spent at sea, are not entirely satisfactory to the student of birds. Moreover, where customary ports of call are confined to high, rocky coasts, limited ornithological opportunity is bound to result. If under these circumstances the observer is making his first visit to these latitudes, he is certain to carry home an inadequate conception of the bird resources of the territory.

In a table at the end of the paper some bird-census results are given which were obtained near Bowman Bay, Foxe Basin, in the summer of 1929. This type of record has not previously been made in Baffin Island. Investigation of this kind reveals wide variation from one area to another in the same locality, in respect to both the species and the number of individuals observed. Some areas are almost destitute of bird life, while others support heavy populations. As would be supposed, a high degree of differentiation also obtains in the dispersal of plant life, with which the birds of any region are closely associated. The counts made on the given unit areas are probably about average for very extensive plains adjoining Foxe Basin. In certain highly favorable sections of the same general district, appreciably greater numbers of birds were noticed per square mile—particularly geese, phalaropes and sandpipers—but opportunity did not offer to make detailed counts.

The three census lists, with explanatory notes, which were made on the Blue Goose Plains near Bowman Bay are as follows (for local map and detailed description of this locality see the author's 'The Blue Goose,' Department of the Interior, Ottawa, 1930, pp. 30-37):—

Census Area No. 1.—Situating south of Camp Kungovik in latitude 65° 31' N., three miles east of Bowman Bay, and calculated to embrace a tract of one square mile. The area is chiefly grass tundra intersected by granitic outliers of the Eswituk Ridge, and bordered by a branch of the Blue

ARCTIC BIRD CENSUSES

Species	Area No. 1		Area No. 2		Area No. 3	
	Nests found	Resident birds	Nests found	Resident birds	Nests found	Resident birds
Pacific Loon.....		2	1	4		6
Red-throated Loon.....						2
Hutchins's Goose.....			1	4		
Lesser Snow Goose.....		8	2	10		4
Blue Goose.....		150	14	350		30
Old-squaw.....		8		18		6
King Eider.....	1	10	2	16	4	12
Willow Ptarmigan.....		8		4		4
Rock Ptarmigan.....		2		6	1	8
Semipalmated Plover.....				4		2
Black-bellied Plover.....	1	6		8	3	10
Ruddy Turnstone.....		10	1	20		
Purple Sandpiper.....		2				
White-rumped Sandpiper.....	2	18	2	26	6	20
Semipalmated Sandpiper.....		4		10		8
Red Phalarope.....	8	40	5	30	10	26
Pomarine Jaeger.....		2				
Parasitic Jaeger.....	1	6		4	1	6
Long-tailed Jaeger.....	1	4	2	8		2
Herring Gull.....		4		6	2	6
Sabine's Gull.....	13	40	3	20		8
Arctic Tern.....		10		40		4
Northern Horned Lark.....		6		8		2
American Pipit.....		2			1	4
Lapland Longspur.....	3	30	4	50	10	60
Snow Bunting.....	5	20	3	30	12	50
Total.....	35	392	40	676	50	280

Goose River. The list is based on observations made during the first three days of July. Nests in the table refer to those with eggs, and usually completed sets. Non-breeding birds of several species doubtless exist, as is the case with the Blue and Lesser Snow Geese, which do not nest in this area.

Census Area No. 2.—This lies immediately to the southwest of the preceding, with a branch of the Blue Goose River between. The parallel of latitude 65° 30' north, intersects it, while its western boundary lies within a

mile of the high-tide contour of Bowman Bay. It embraces an area of about one and one-fourth miles square, composed of grass tundra with low outcrops of Pre-Cambrian crystallines. Half of the area lies south of these ridges and includes a portion of the great grass plain which extends from Bowman Bay to Putnam Highland. It encloses a portion of the breeding ground of the Blue Goose. Observations were made on July 4 and 5.

Census Area No. 3.—This is taken, as the others, to include both grass tundra and granitic tracts of the Eswituk Ridge, one square mile in extent west of Blue Goose River at Camp Kungovik. The area comprises about two-thirds typical flat tundra with numerous ponds, and the remainder granite-gneiss uplands rising ten to fifty feet above the adjoining plain. The result of this census is based on observations made from July 6 to 11. Estimates of the summer-resident birds of all the areas worked must be regarded as only approximately correct, while the number of nests found is probably no more than half of the actual number existing in the different areas. Nests of some species were not located, but it is practically certain that all were breeding within the locality.

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EXPLANATION OF PLATE 2

UPPER FIGURE.—A modified example of the Arctic grass tundra interspersed with low Pre-Cambrian ridges and strewn with glacial erratics. Cape Alberta, Foxe Basin, July, 1929. Farther north vast areas of pure grass tundra occur unrelieved by any boulders or rock outcrops. Both types of country support a wealth of bird life.

LOWER FIGURE.—Rugged granite and gneiss terrain near McKellar Bay, Baffin Island, early June, 1931. A typical section of the desert tundra where vegetation is greatly impoverished and bird life reduced to a minimum.