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OBSERVATIONS ON THE SEABIRDS OF MANAWAGONISH ISLAND, NEW BRUNSWICK: MOVEMENTS AND POPULATION CHANGES 1940-1983[1]

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Since 1940, significant changes in the population of seabirds nesting on Manawagonish Island, New Brunswick, have been observed. Most notably there were large increases in the numbers of nesting great black-backed gulls, Larus marinus, and double-crested cormorants, *Phalacrocorax auritus*. Dispersal patterns for herring gulls, *L. argentatus*, from this colony show a late summer and early fall movement northward into the Northumberland Strait and Gulf of St. Lawrence, as well as southward travel as far as the Gulf of Mexico and a summer concentration around Cape Cod. During the winter months birds appear to congregate in metropolitan areas between Long Island and Philadelphia.

Depuis 1940, des changements importants dans les populations d'oiseaux de mer nichant sur l'île Manawagonish, au Nouveau-Brunswick, ont été observés; le changement le plus notable étant l'augmentation considérable dans le nombre de Goélands à manteau noir, *Larus marinus*, et de Cormorans à aigrettes, *Phalacrocorax auritus*, nichant en ce lieu. Les modes de dispersion des Goélands argentés, *L. argentatus*, en provenance de cette colonie, indiquent que vers la fin de l'été, début de l'automne, il y a un mouvement de ces oiseaux vers le Nord, en direction du détroit de Northumberland et du golfe Saint-Laurent, en plus d'un mouvement vers le Sud, aussi loin que le golfe du Mexique, et que, en été, une concentration particulière de ces même oiseaux se trouve dans la région de Cape Cod. Pendant les mois d'hiver, ils semblent se rassembler dans les régions métropolitaines de Long Island et de Philadelphie.

Introduction

Significant population changes in a number of seabird species have been documented in Atlantic Canada since the end of the last century. Christie (1979), for example, summarizes changes that have been recorded in Maritime populations of the gannet, *Morus bassanus*, great and double-crested cormorants, *Phalacrocorax carbo* and *P. auritus*, and in herring, great black-backed and laughing gulls, *Larus argentatus*, *L. marinus* and *L. atricilla*. Amid escalating exploitation of the marine resources of the Fundy region, this information, as well as data on patterns of movement such as that provided by Brown et al. (1975) and Brown (1977), may prove valuable in reducing industry-related seabird mortality. Nevertheless, Able (1983) notes that in North America we have remarkably little detailed information on the migration routes and destinations of specific population of birds. Here we report on dispersal patterns, with particular reference to herring gulls, and on population changes observed over a 43-year period in great black-backed gulls, double-crested cormorants and great blue herons, *Ardea herodias*, nesting on Manawagonish Island, New Brunswick, a seabird colony adjacent to the port of Saint John. Both Brown et al. (1975) and Markham (1978), who reviewed the status of the

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double-crested cormorant in Canada, were apparently unaware of the existence of the Manawagonish Island cormorant colony.

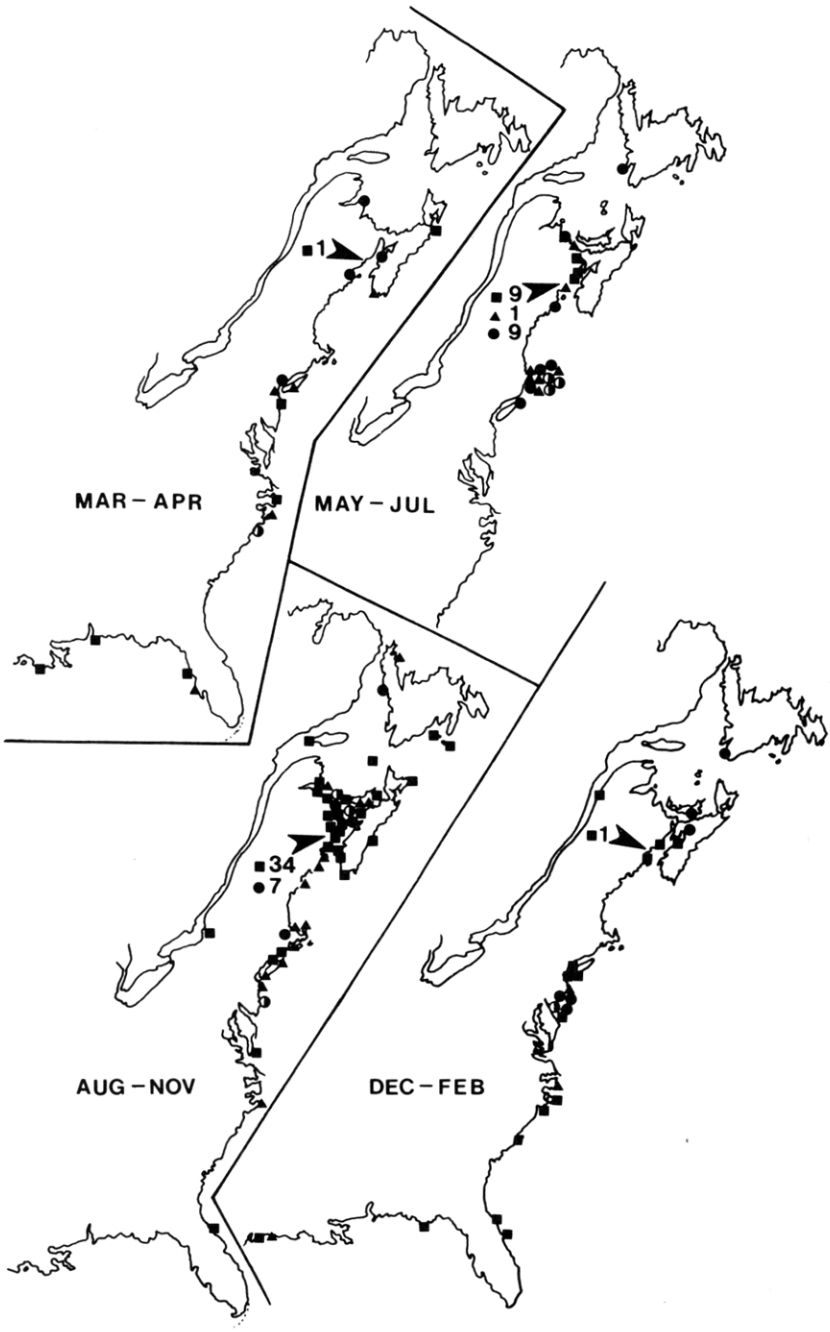

Fig 1 Band returns for herring gulls fledged from Manawagonish Island, New Brunswick. Squares show first-year birds, triangles second-year birds, half-open circles third-year birds and solid circles adults. Arrow and preceding symbols record returns from banding site.

Methods

From 1940 to 1983, we banded over 5200 fledgling herring gulls, more than 1100 great black-backed gulls and at least 200 double-crested cormorants on Manawagonish Island (lat. 45° 12', long. 66° 06') and its small satellite, Thumb Cap Island, in the lower Bay of Fundy. Together Manawagonish and Thumb Cap Island occupy less than 20 hectares and are located 1.5 km offshore. Unfortunately we are unsure as to precisely how many birds were marked, since before 1955, records for this study by Astle, the Canadian Wildlife Service, and the U.S. Bird Banding Laboratory are incomplete with regard to total birds banded. Banding was carried out on one day in July or August during 38 of the nesting seasons from 1940 to 1983 using aluminum leg bands provided by the U.S. Fish and Wildlife Service to Astle. For inspection, band returns have been divided into four periods; May-July (breeding), August-November (post-breeding dispersal), December-February (wintering), and March- April (pre-breeding).

Results and Discussion

Patterns of movement for herring gulls banded on Manawagonish Island are based on 172 returns (Fig 1). Individuals of all ages, but particularly first-year birds, wander widely along the eastern seaboard and into the Gulf of Mexico during the winter and spring months. During the summer and fall, adult and immature herring gulls from Manawagonish Island congregate in the Cape Cod region, but during the winter months this concentration seems to shift south to metropolitan areas between Long Island, New York and Philadelphia. Drury and Nisbet (1972) estimated that 34% of the east coast population of herring gulls congregated about New York during the winter of 1965 and Threlfall (1978) found that New York was the prime wintering area for herring gulls banded in Newfoundland. During the late summer and autumn there is a northward movement of herring gulls up the Bay of Fundy and across the Isthmus of Chignecto to Northumberland Strait and the east coast of New Brunswick and as far as Newfoundland. Both adult and immature birds from the Manawagonish Island colony also spend the winter months in these regions. Such northward movement by young herring gulls following the breeding season appears to be characteristic of eastern North American herring gull colonies (Gross 1940, Moore 1976, Threlfall 1978). Judging from our returns, as well as those of birds banded in Newfoundland (Threlfall 1978) and about the Great Lakes (Moore 1976), the entire Gulf of St. Lawrence seems to be important in the late summer and early fall movements of the Eastern Canadian herring gull population. Large numbers of birds are likely dispersed over the region during this period and the many small fishing harbours, shallow lagoons and estuaries undoubtedly provide good feeding sites.

Based on movements by first-year birds in January-February, Burger (1981) found gull colonies following one of two general dispersal patterns; either long distance or short distance. She found that gulls from England, Denmark and Jamaica Bay, New York were short-distance migrants, usually remaining within 200 km of the natal colony. Birds banded at colonies in the Great Lakes, Newfoundland, Maine and Finland were identified as long-distance dispersers. The Manawagonish Island colony seems to fit the latter pattern, being characterized by long-distance movement by first-year birds in January-February (range 75-3,075 km, $X = 1,268$ km; $n = 7$).

Our returns for great black-backed gulls ($N = 35$) and double-crested cormorants ($N = 14$) are few and are therefore not illustrated. For both species there is an indication of some northward movement into the Northumberland Strait following

the breeding season, coupled with long-distance southward flights during the same period and throughout the winter (maximum distance GBBG = 2,360 km, DCC = 2,200 km). Some great black-backed gulls fledged from Manawagonish Island spend the winter months on the New Brunswick coast as well.

Since 1940 when our banding began, Drury and Nisbet (1972) have recorded shifts in herring gull demography and Cannell and Maddox (1983) have reported a significant decline in the number of herring gulls nesting on Kent Island, New Brunswick, principally between 1950 and 1965. Unfortunately our (small number of) returns have not allowed us to identify how these changes may have affected the Manawagonish Island colony, which now includes over 400 pairs of herring gulls (A.R. Lock, Canadian Wildlife Service, Dartmouth, N.S., pers. comm.). When banding was first initiated (1940) great black-backed gulls (3 pairs) nested only on Thumb Cap Island and this island is now dominated by black-backs. Pettingill (1939) reported that the great black-backed gull only began as a common nesting species in the Grand Manan Archipelago in the late 1930's, although he cites a Kent Island record as early as 1933, this being the first recent breeding record for New Brunswick. By 1952, Squires (1952) was able to report this gull was breeding commonly on most of the islands in the Bay of Fundy. Since 1963 we have banded 77-170 black-backs annually on Manawagonish and Thumb Cap islands. Canadian Wildlife Service (1979) surveys indicated 107 pairs of black-backed gulls on the two islands in June of 1979 (A.R. Lock pers. comm.). Great blue herons were first noted nesting (2 pairs) on Manawagonish Island by Astle in 1948 (Squires 1952). Squires (1976) reported about 40 nests on Manawagonish Island in 1963, and CWS (1979) surveys revealed a minimum of 44 active nests in 1979 (A.R. Lock pers. comm.). Mendall (1936) and Gross (1944) have documented the increase in double-crested cormorants in this area after their disappearance in the 19th Century. When banding began in 1940, only 30 pairs of double-crested cormorants nested on Manawagonish Island and cormorants have never been observed nesting on Thumb Cap. The colony included 2023 active nests in trees in June of 1979 (A.R. Lock pers. comm.). Until 1978 cormorants had always been observed nesting in the trees but in that year the first ground nesting was discovered on the northern end of the island. Extensive tree deaths and colony expansion are no doubt the reason. While banding in 1983 we observed that large numbers of cormorant nests were located on the ground. Preliminary observations indicate that birds nesting early in the season select trees, while late nesters are forced to choose ground locations.

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