

NU Site 54 – North Belcher Islands

Location: 56°45'N, 79°40'W

Size: 52 km²

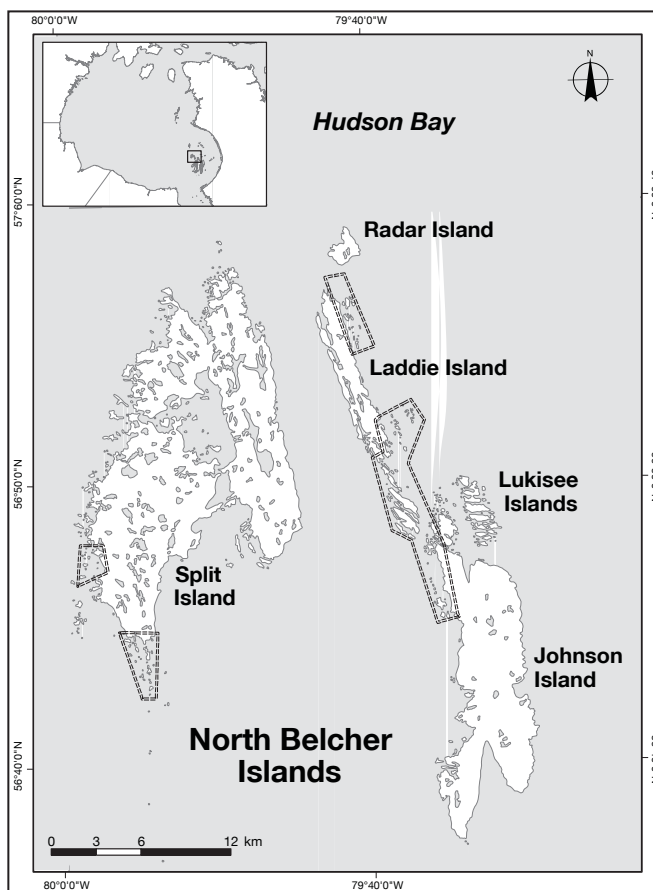
Description: The North Belcher Islands are situated in Hudson Bay just north of the main Belcher Islands, about 60 km northeast of the community of Sanikiluaq. The archipelago consists of three large islands (Split, Johnson, and Laddie) and almost 700 small islands. The islands north of Laddie Island are typically hump-shaped, with steep sides of exposed bedrock, and are sparsely vegetated. Other islands in the vicinity are more low lying. Exposed bedrock is predominant, but there are also extensive areas of cobble and gravel. Islands off southwest Split Island are composed completely of cobble and boulders (Nakashima and Murray 1988).

Until the 1940s, Split Island was the most important Inuit camp in the North Belcher Islands, owing to an abundance of walrus. This area continues to be an important camping and hunting area for people from Sanikiluaq (Nakashima and Murray 1988).

Biological value: In 1985, an estimated 2870 pairs of Hudson Bay Common Eiders (*S. m. sedentaria*) nested on small islands of this area, over 1650 around Laddie Island and 1215 near Split Island (Nakashima and Murray 1988). This represents 7% of the Canadian population. Not all islands were inhabited by eiders. In their survey, which covered half the small islands, Nakashima and Murray (1988) recorded 80% of nests on 11% of the islands in the Laddie Island area and 87% of nests on 5% of the islands in the Split Island area. More recently, Inuit report that there has been massive die-off of Common Eiders during winters with heavy ice conditions. This was confirmed by Robertson and Gilchrist (1998), who detected a 75% decline in the breeding population in the Split, Johnson, and Laddie island archipelagos.

Many Hudson Bay eiders winter along the western land-fast ice edge northwest of the Belcher and Sleeper islands and, to a much lesser extent, on polynyas around the Belcher Islands (Freeman 1970; Nakashima and Murray 1988). Concentrations of wintering birds are very unusual in both the Northwest Territories and Nunavut (Jamieson et al. 2001). In spring, eiders disperse as open water becomes available elsewhere; islands at the edges of archipelagos tend to be the first ice-free nesting areas. Eiders at the Sleeper Islands initiate nesting in the second and third weeks of June, and the eggs hatch in July, shortly after which families disperse from the nesting islands. Brood rearing continues into November.

About 380 pairs of Arctic Terns and 180 pairs of Glaucous and Herring gulls nested on islands in the archipelago in 1985, usually in association with Common Eiders (Nakashima and Murray 1988). However, more recent surveys indicated that the breeding numbers of these species have declined significantly. Causes of these declines are unknown (Gilchrist and Robertson 1999).



Sensitivities: Nesting eiders are sensitive to disturbance at the colony and will desert the site altogether if disturbance is persistent. The occurrence and success of colonies are highly dependent on the presence of small isolated islands, which are less accessible to predators. Pollution in the surrounding marine environment would be detrimental to the eiders.

Potential conflicts: Oil exploration in central Hudson Bay is a potential source of pollution. Prevailing west and northwest winds render the east coast of the bay most susceptible to oil damage (Davidson 1985). Hunting and egg collecting may maintain local populations below the habitat's carrying capacity.

Status: This key site is an Important Bird Area in Canada (NU031; IBA Canada 2004).

Location: 56°22'N, 77°40'W

Size: 60 km²

Description: The Salikuit Islands archipelago is situated in eastern Hudson Bay about halfway between the Belcher Islands and the Quebec coastline, approximately 80 km east of the community of Sanikiluaq. The archipelago consists of 91 islands less than 50 ha in size and 12 between 50 and 500 ha. The islands are primarily low-lying, exposed bedrock. Some islands have extensive cobble beaches, which in some cases connect islands (Nakashima and Murray 1988). The islands are rarely visited by people; however, in the days before air travel, they were an important stopover for travellers moving between the Belcher Islands and Hudson's Bay Company posts on the mainland (Nakashima and Murray 1988).

Biological value: In 1985, an estimated 895 pairs of Hudson Bay Common Eiders (*S. m. sedentaria*) nested on small islands in this area (Nakashima and Murray 1988). This represents 2% of the Canadian population. Not all islands were inhabited by the eiders; in their survey, which covered a third of the small islands, Nakashima and Murray (1988) recorded 84% of the nests on 20% of the islands.

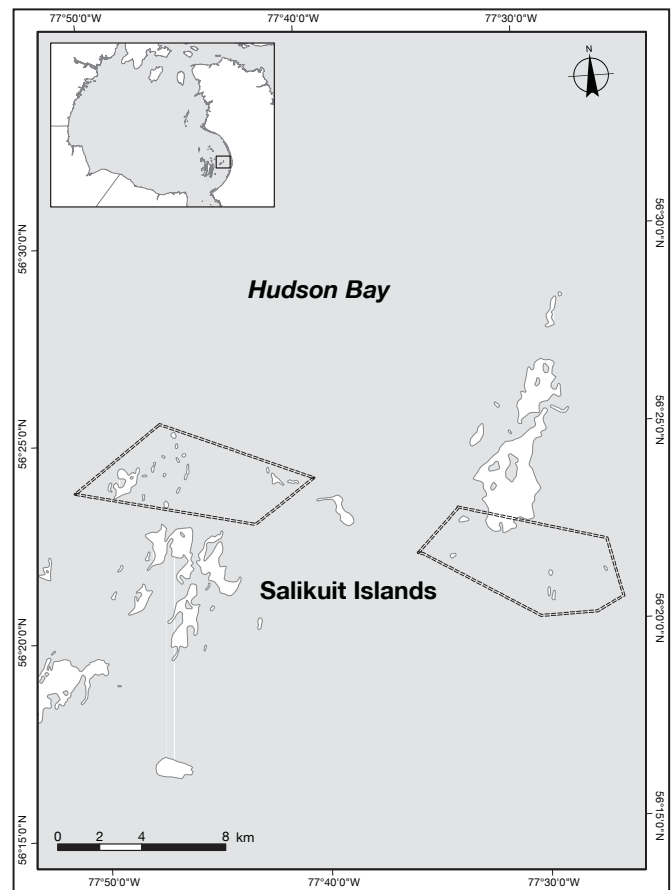
Many Hudson Bay eiders winter along the western land-fast ice edge northwest of the Belcher and Sleeper islands and, to a much lesser extent, on polynyas around the Belcher Islands (Freeman 1970; Nakashima and Murray 1988). Concentrations of wintering birds are very unusual in the Northwest Territories and Nunavut (Jamieson et al. 2001). In spring, eiders disperse as open water becomes available elsewhere; islands at the edges of archipelagoes tend to be the first ice-free nesting areas. Eiders at the Salikuit Islands probably initiate nesting in the second and third weeks of June, and the eggs hatch in mid- to late July, shortly after which families disperse from the nesting islands. Brood rearing continues into November.

A total of 218 pairs of Arctic Terns and 179 pairs of Glaucous and Herring gulls nested on islands in the archipelago in 1985, usually in association with Common Eiders (Nakashima and Murray 1988).

Sensitivities: Nesting eiders are sensitive to disturbance at the colony and will desert the colony site altogether if disturbance is persistent. The occurrence and success of colonies are highly dependent on the presence of small isolated islands, which are less accessible to predators. Pollution in the surrounding marine environment would be detrimental to the eiders.

Potential conflicts: Oil exploration in central Hudson Bay is a potential source of pollution. Prevailing west and northwest winds render the east coast of the bay most susceptible to oil damage (Davidson 1985).

Status: This key site is an Important Bird Area in Canada (NU032; IBA Canada 2004).



NU Site 56 – Twin Islands

Location: 53°10'N, 79°55'W

Size: 308 km²

Description: The Twin Islands are situated in central James Bay approximately 60 km offshore of mainland Quebec. North Twin Island, which is approximately 150 km² in area, is composed chiefly of unconsolidated sand and gravel deposits. Maximum elevation is 60 m above sea level. Approximately one-quarter of the island is covered by lakes. Sand dunes occur along half of the coastline, and wide tidal flats border most of the island. Marshland is scattered throughout the island. Tussock tundra is also common, especially in western areas of the island. Small stands of white spruce, dwarf birch, and willows are present. South Twin Island, which occurs approximately 11 km southeast of North Twin Island, is approximately half the size of its northern counterpart. This island has similar topography, but there are fewer trees and more mossy tundra (Manning 1981).

Biological value: The status of this area as a key habitat site is tentative; the available information is dated or otherwise inadequate for a full assessment.

In 1973, 1500 Canada Geese (*B. c. interior*) nested on North Twin Island. Similar densities of birds were noted on South Twin Island (Manning 1981). Therefore, the breeding population of the two islands was approximately 2300 birds, which represents 0.5% of the present population of *B. c. interior*. The geese arrive by early May and depart from the area by the end of September.

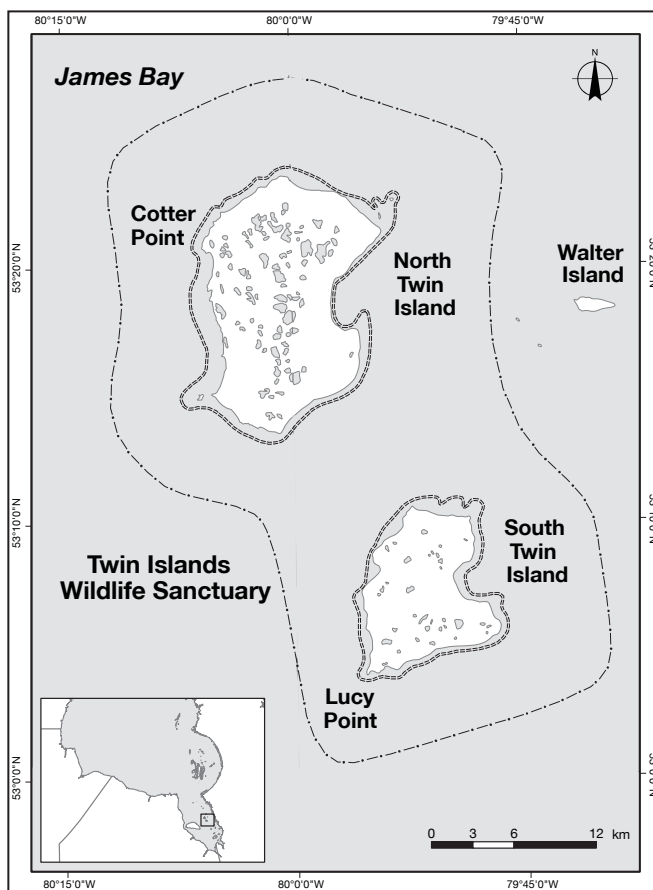
Manning (1981) estimated the following breeding populations of other birds on North Twin Island: 1450 waterfowl, mostly Long-tailed Ducks, Lesser Scaup, Northern Pintails, and Green-winged Teal; 800 Willow Ptarmigan; 1200 Semipalmated Plovers; 2000 Semipalmated Sandpipers; 1800 other shorebirds, such as Northern Phalaropes, Least Sandpipers, Dunlins, and Purple Sandpipers; 500 Arctic Terns; and 8000 passerines, mostly Horned Larks, Water Pipits, Savannah Sparrows, Tree Sparrows, White-crowned Sparrows, and Lapland Longspurs.

The Twin Islands are the most heavily used summer retreat and maternity denning area by polar bears in James Bay (Jonkel et al. 1976).

Sensitivities: Low-lying areas are susceptible to terrain disruption. Geese and other wildlife are sensitive to disturbance.

Potential conflicts: None.

Status: This area is part of the James Bay Preserve and has been designated as the Twin Islands Wildlife Sanctuary. Neither designation confers any legal protective status to the lands in this area. It is an Important Bird Area in Canada (NU034; IBA Canada 2004) and an International Biological Programme Site (Site 6-2; Beckel 1975).



Location: 53°35'N, 79°00'W

Size: 3360 km²

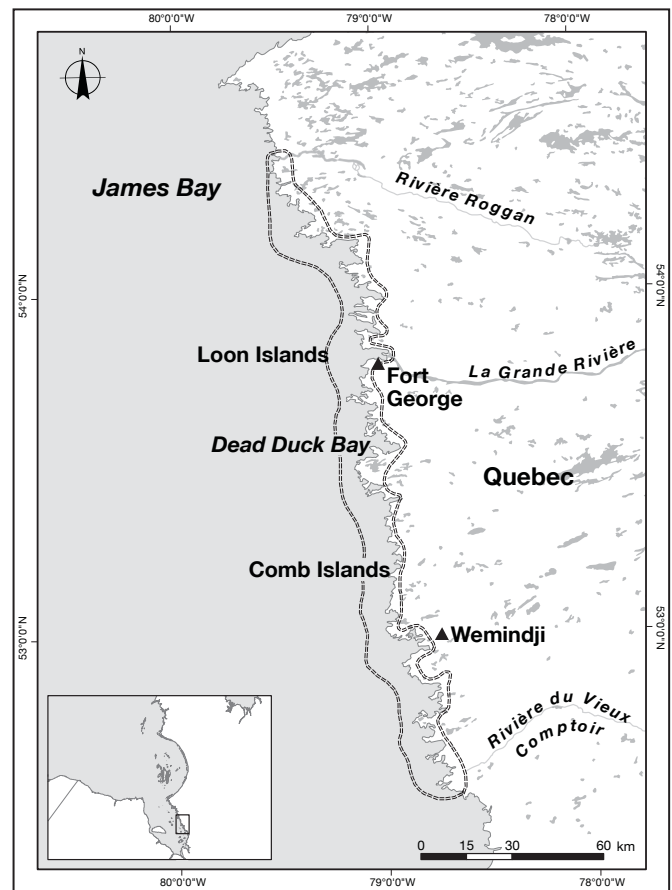
Description: All offshore islands and reefs in this area are within Nunavut. These islands, along with the sheltered bays, marshes, mudflats, and eelgrass beds between the Rivière du Vieux Comptoir and the Rivière Roggan on the Quebec coast of James Bay, constitute the key habitats. The many rivers and streams flowing into James Bay have created a rich blend of marine, estuarine, and freshwater environments with highly productive waters and coastal wetlands. Eelgrass grows extensively in sheltered areas, such as in the lee of the Comb Islands and in Dead Duck Bay. Silt, sand, or coarse gravel flats occur in bays with incoming streams and rivers, and many nearshore islands are connected to the mainland during low tide. Marine, brackish, and freshwater marshes are associated with the stream- and tide-fed bays.

Biological value: The marine, estuarine, and freshwater habitats along the Quebec coast of James Bay are extremely important for staging Canada Geese, Atlantic Brant, and Lesser Snow Geese. An unknown variety and number of shorebirds, such as Black-bellied Plovers, Sanderlings, Semipalmated Sandpipers, Hudsonian Godwits, and Red Knots, also stage here during migration. Moulting and fall staging dabbling ducks, particularly American Black Ducks, and seaducks are also very abundant (Curtis and Allen 1976; Morrison and Harrington 1979). The large number and diversity of ducks and geese that use the area have been attributed to the mosaic of habitats that occur along the irregular coastline (Reed et al. 1996a,b).

Canada Geese are among the most abundant birds during spring migration. Over 51 300 and 65 400 Canada Geese (*B. c. interior*) were seen in this area in late May 1973 and 1974, respectively (Curtis and Allen 1976), which are each over 5% of the Canadian population of *B. c. interior*. Thousands of American Black Ducks feed on the mudflats and eelgrass beds during the summer months; about 6900 were seen in the area in late July and early August 1974 (Curtis and Allen 1976), a total that represented over 2% of the Canadian American Black Duck population at that time. In addition, 4000 dabbling ducks, 6300 diving ducks, and 17 400 seaducks were seen during the 1974 surveys.

Canada Geese, Lesser Snow Geese, Atlantic Brant, and shorebirds are abundant in September and October. Over 61 400 and 120 700 Canada Geese were seen in mid-September and early October 1973, respectively. The latter number is over 9% of the Canadian population estimate. In 1973, over 10 000 Atlantic Brant were present in early October. The number increased to over 20 500 by late October — about 16% of the Canadian population of Atlantic Brant in the early 1970s. Dead Duck Bay, in particular, is heavily used by Brant. Bellrose (1980) stated that James Bay was the most important fall staging area for Atlantic Brant, citing that in mid-September 1971, over 60 000 Brant used the Fort George area.

Thousands of Snow Geese migrate through the area, but most birds stage in southern James Bay. Estimates of use



by shorebirds in late summer and fall are not available. This represents a serious gap in our knowledge of the importance of James Bay to migratory birds (Curtis and Allen 1976). The above data do not take into account turnover rates at staging sites and therefore underestimate the extent of staging in the area.

Sensitivities: Staging and moulting waterfowl and shorebirds are sensitive to disturbance. Pollution or degradation of the marine, estuarine, and freshwater habitats would be detrimental.

Potential conflicts: Hydroelectric projects in Quebec could result in the degradation of habitats by disrupting water flow and altering sedimentation patterns, salinity gradients, and freshwater nutrient input. Increased disturbance or destruction of habitat could also occur. Recent evidence of extensive die-offs of eelgrass beds, on which staging waterfowl feed extensively, are of especially great concern (A. Reed, pers. commun.).

Status: This key site is part of the James Bay Preserve. This designation, however, pertains to hunting activities and does not confer any legal protective status to the lands in this area. It is an Important Bird Area in Canada (NU035; IBA Canada 2004).

NU Site 58 – Akimiski Island

Location: 53°10'N, 81°20'W

Size: 1159 km²

Description: Akimiski Island is the largest island in James Bay. It is situated in the midwestern part of the bay opposite the mouth of the Attawapiskat River. The island is underlain by Silurian limestone and dolomite (Sanford et al. 1968) and has a very low relief. The southern shore rises steeply from the water, then gradually slopes downward to the mudflats along the northern shore.

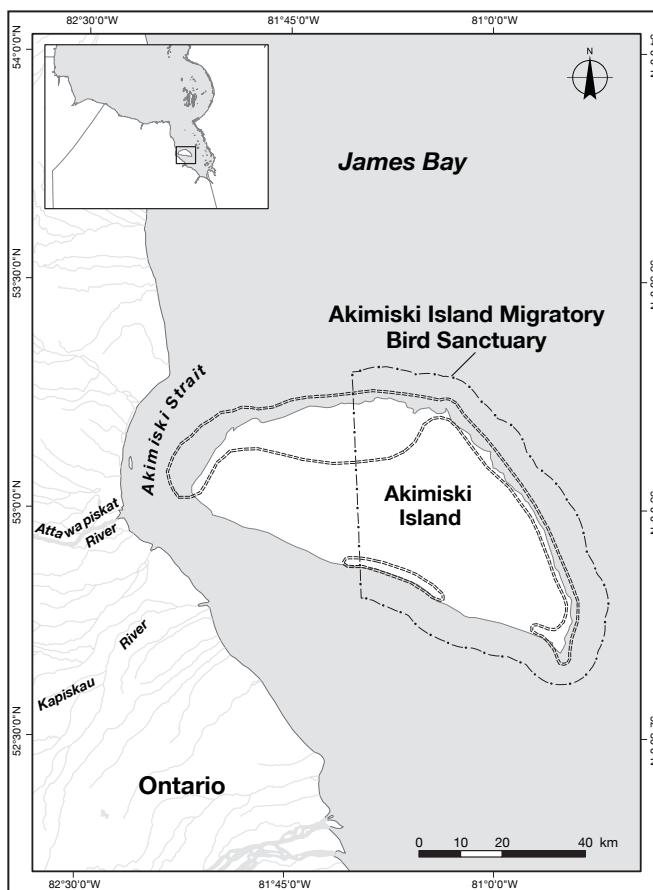
Although the island lies within the boreal forest region, many plant species with more coastal and tundra-like affinities are abundant (Blaney and Kotanen 2001). Dominant vegetation includes salt marshes and shrub fens near the coast, graminoid-dominated peatlands in the interior of the island, and spruce and tamarack forest scattered throughout the island (Blaney and Kotanen 2001).

Biological value: Up to 295 000 Lesser Snow Geese (>15% of the Canadian population in 1972) have staged on the island during the spring (Curtis 1973a), although more recent counts are much lower than that (Anonymous 2003). Snow Geese were present intermittently in small numbers (1–75 adults) on the island prior to 1968; since 1968, however, nesting has occurred annually (Abraham et al. 1999), and the population has increased to about 2500 nesting birds in recent years (Hudson Bay Project 2003).

Approximately 100 pairs of Caspian Terns nested on the small, offshore islands in Akimiski Strait in the early 1980s (R.I.G. Morrison, pers. commun.) and represented over 1% of the Canadian population. At that time, the Caspian Tern was a rare species in Canada (Martin 1978). Ring-billed Gulls and Herring Gulls also nest on the island in Akimiski Strait.

Large Canada Geese, from the Southern James Bay Population, nest among the permafrost hummocks in the tamarack fen and stage on the coast of the island. Most recent estimates indicate that a spring population of about 20 000 adult Canada Geese (*B. c. interior*) (>20% of the Southern James Bay Population) is present on the island (Walton et al. 2003). Approximately 20 000 Atlantic Brant have been observed in coastal areas near the island (Curtis 1973b). Thousands of American Black Ducks moult and stage along the east coast, particularly around the latitude of Akimiski Island, from June to September (H. Lumsden, pers. commun., in Allison 1977; Ross 1984).

The west coast of James Bay, including Akimiski Island, provides critical staging habitat for thousands of shorebirds (Morrison and Harrington 1979; Anonymous 2003). Large portions of the North American Red Knot and Hudsonian Godwit populations probably stage along these coasts. Semipalmated Sandpipers are also abundant (Morrison and Harrington 1979). On Akimiski Island, the northwest coast appears to be the most important area for staging shorebirds (R.I.G. Morrison, pers. commun., in Allison 1977). Marbled Godwits also nest on Akimiski



Island, probably forming a significant portion of the James Bay population of this species (R.I.G. Morrison, pers. commun.).

Northern Akimiski Island is a summer retreat and maternity denning area for polar bears (Jonkel et al. 1976).

Sensitivities: Staging and moulting waterfowl and shorebirds are sensitive to disturbance. Pollution or degradation of the marine, estuarine, and freshwater habitats would be detrimental.

Potential conflicts: Hydro development in Quebec or Ontario could result in catastrophic alterations to the James Bay estuarine and marine ecosystems. Increasing numbers of Lesser Snow Geese, staging in the area during spring migration, are having a severe impact on salt marsh habitat along parts of the Hudson Bay and James Bay coastlines (Batt 1997).

Status: The eastern part of the island includes the Akimiski Island Migratory Bird Sanctuary. This key site is also part of the James Bay Preserve, which, however, pertains to hunting activities and does not confer any legal protective status to the land. It is an Important Bird Area in Canada (NU036; IBA Canada 2004).

Location: 51°50'N, 78°52'W

Size: 170 km²

Description: Boatswain Bay lies in the southeastern corner of James Bay, approximately 40 km north of Fort Rupert, Quebec. The site includes all waters and lands in Boatswain Bay and all land 3 km inland from the high tide mark. All offshore islands and reefs in this area are within Nunavut. The topography is generally of low relief. The land slowly rises from coastal mudflats, bordered by spikerush marsh, through a sedge–grass lowland complex to willow and spruce farther inland. On the south side of Boatswain Bay, the marsh is relatively narrow, but it increases in width to approximately 1.6 km on the north side (Smith 1944). The area is one of two salt marshes along the Quebec side of James Bay (Allison 1977).

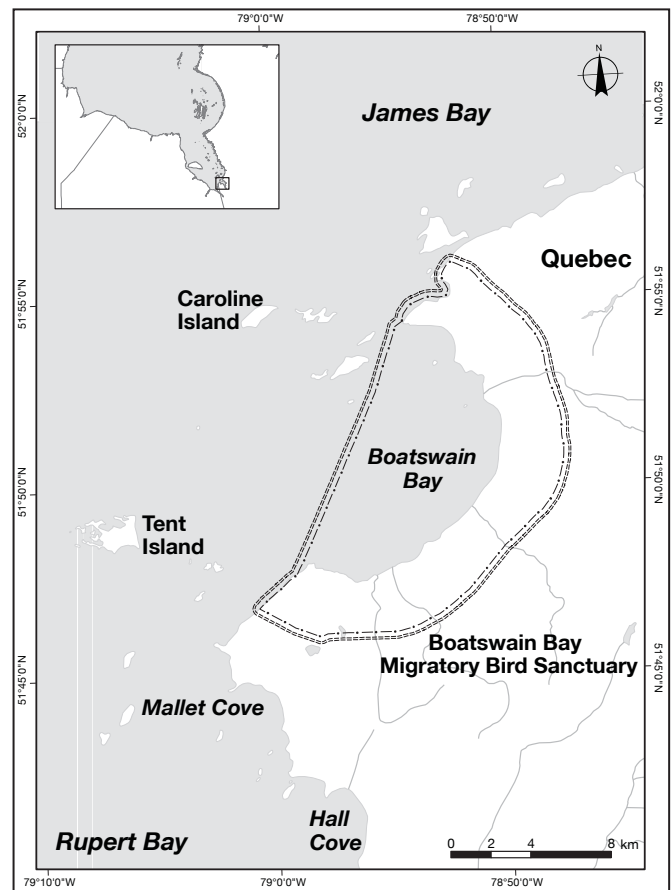
Biological value: The Quebec coast of James Bay is very important for a variety of migrating and moulting water birds, including Canada Geese, Lesser Snow Geese, Atlantic Brant, American Black Ducks, Northern Pintails, scoters, scaups, and several species of shorebirds (Curtis and Allen 1976). Boatswain Bay is an important staging site for Canada Geese and Lesser Snow Geese (Allison 1977; Bellrose 1980). Over 14 800 Canada Geese and 3000 Lesser Snow Geese were seen in and around Boatswain Bay during a survey in the spring of 1972 (Curtis and Allen 1976). Fall migrating Canada and Snow geese also make intensive use of the coastal areas. Curtis and Allen (1976) also recorded 535 migrating Brant in the spring and a further 2474 birds in the fall. Bellrose (1980) stated that James Bay is the most important fall staging area for Atlantic Brant. Turnover rates are not known, but it is likely that far greater numbers of geese stage in this area, accounting for greater than 1% of the Canadian populations of Canada Geese and Brant.

Dabbling ducks, particularly American Black Ducks, stage, moult, and nest in the surrounding area. The number of American Black Ducks likely exceeds 1% of the Canadian population. Large numbers of shorebirds also migrate through this area (Curtis and Allen 1976).

Sensitivities: Staging and moulting waterfowl and shorebirds are sensitive to disturbance. Pollution or degradation of the marine, estuarine, and freshwater habitats would be detrimental.

Potential conflicts: Hydroelectric projects in Ontario and Quebec could result in the degradation of habitats by disrupting water flows, sedimentation patterns, salinity gradients, and freshwater nutrient input and through increased disturbance.

Status: This key site is within the Boatswain Bay Migratory Bird Sanctuary. It is also part of the James Bay Preserve and is an Important Bird Area in Canada (NU097; IBA Canada 2004). The latter two designations, however, do not confer any legal protective status to the land.



NU Site 60 – Hannah Bay

Location: 51°15'N, 79°45'W

Size: 146 km²

Description: Hannah Bay lies in the extreme southern end of James Bay on the Ontario–Quebec border. Two large rivers, the Harricanaw and the Missisicabi, drain into Hannah Bay. All offshore islands and reefs in this area are within Nunavut.

Hannah Bay is one of the widest expanses of marsh along the James Bay coast (Allison 1977). The coastal marsh averages approximately 1.5 km in width, whereas the adjacent tidal flats are approximately 15 km wide. The flats are generally hard-packed silts and clays, and the water in the bay is turbid and brackish. The marsh-edge vegetation of rush species merges into sedge marshes with numerous ponds. The west side of the bay is paralleled by three beach ridges, which divide the marsh into sections with progressively more sphagnum as one moves inland (Smith 1944).

Biological value: Extensive mudflats and sedge marshes attract large numbers of migrating Lesser Snow Geese, Canada Geese, and shorebirds. In spring, numerous ponds of meltwater form in the marsh along the willow fringe. These ponds are heavily used by Lesser Snow Geese and dabbling ducks when they first arrive in late April and early May (Curtis and Allen 1976). The mouths of the Harricanaw and Missisicabi rivers are important to Atlantic Brant in late May and early June (Allison 1977).

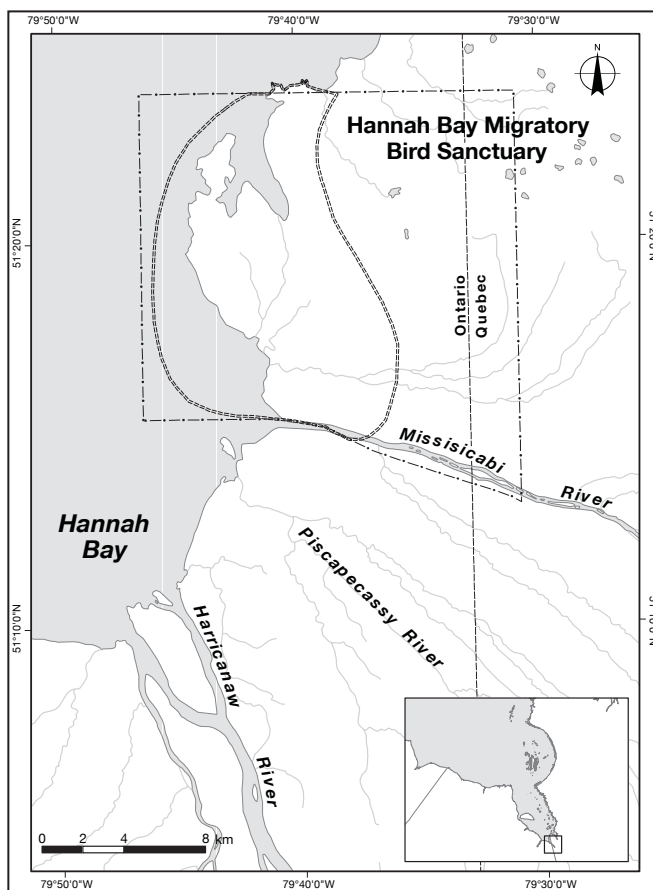
Snow Geese are the most numerous species staging in Hannah Bay. In fall 1973, 28 560 Lesser Snow Geese and 1884 Giant Canada Geese (*B. c. maxima*) were noted (Curtis 1973a). Lumsden (1971) recorded 64 538 Lesser Snow Geese from 15 to 18 October 1971.

The endangered Eskimo Curlew has been seen near Hannah Bay (Hagar and Anderson 1977).

Sensitivities: Staging and moulting waterfowl and shorebirds are sensitive to disturbance. Pollution or degradation of the marine, estuarine, and freshwater habitats would be detrimental.

Potential conflicts: Hydroelectric projects in Quebec or Ontario could result in the degradation of habitats by disrupting water flows, sedimentation patterns, salinity gradients, and freshwater nutrient input and through increased disturbance.

Status: Part of the area lies within the Hannah Bay Migratory Bird Sanctuary, which is also a Ramsar site (Wetland of International Importance) (Ramsar 2005). This area is also part of the James Bay Preserve. The latter two designations, however, do not confer any legal protective status to the land.



7.0 Discussion

Alexander et al. (1991) described 80 key terrestrial habitat sites in the Northwest Territories, which included the present-day Nunavut. In this updated description, we have added eight new sites (Northwest Territories: Tahiryuak Lake, Kagloryuak River Valley, McKinley Bay–Phillips Island, Kukjuktuk and Hutchison Bays, and Ramparts River Wetlands (Tu’eyeta); Nunavut: Western Cumberland Sound Archipelago, Southwestern Victoria Island, and Markham Bay) and deleted two sites (Cape Dorset, Awry Island). Sites were added where recent survey data indicated that the feature species numbers there exceeded 1% of the Canadian population. Sites were deleted where more recent survey data indicated that the numbers of the feature species there had declined below 1% of the Canadian population. In one case, the archipelagoes in Ungava Bay important to Common Eiders were combined into one site (Ungava Bay Archipelagoes), because recent estimates of the breeding population of that species indicated that no one archipelago met the 1% criterion. Also of note in the present report is the better quantification of shorebird numbers at some sites (Rasmussen Lowlands, Creswell Bay, Foxe Basin Islands). In the Northwest Territories, the 23 sites represent a range of habitat types, including boreal wetlands (30%), riverine and lake shallows (39%), low- and mid-Arctic wetlands (13%), marine coastal (13%), and one bird cliff. In Nunavut, on the other hand, bird cliffs comprise the majority of sites (37%), followed by low-, mid-, and high-Arctic wetlands (28%), marine coastal (22%), river and lake shallows (6%), and glaciers/uplands (6%).

7.1 The database

There continues to be considerable variability in the quality and quantity of data across all 83 key terrestrial habitat sites described in this report. Many of the initial data on key terrestrial sites in the Northwest Territories and Nunavut resulted from large survey efforts associated with proposed industrial development in the 1970s and 1980s (Mallory and Fontaine 2004). In the face of limited resources available for such routine inventory since then, data acquisition from many of these sites has been sporadic at best. Since Alexander et al. (1991), 60% of the 78 sites (72% in the Northwest Territories; 58% in Nunavut) from that report have had additional data collected on the feature species at each site (i.e., meet the 1% criterion). Virtually all

major goose colonies have been surveyed since Alexander et al. (1991). The majority of bird cliffs (60%) in Nunavut have had data updated, as has the one bird cliff in the Northwest Territories (Cape Parry). Some of these sites have seen routine updating during the intervening 12 years (i.e., some goose and seabird colonies), while others have had just one resurvey. Also of note since 1991 has been the increasing focus on other taxonomic groups of migratory birds — namely, shorebirds and waterbirds — and the need to better understand breeding populations in light of heightened conservation concern for these groups. As a result, extensive ground-based surveys were conducted at a number of sites in the late 1990s and early 2000s. The results from these have led to the addition of new sites in the present report or a better understanding of the importance of previously included sites.

In the Northwest Territories, the 28% of sites not having had additional data collected since 1991 are primarily river and lake shallows along the Mackenzie Valley. In Nunavut, the 42% of sites not having had additional data collected since 1991 include the river shallows in the central barrens (e.g., Thelon River, Lower Back River) and the marine coastal habitat in James Bay (e.g., Boatswain Bay, Hannah Bay). Considering that the data for many of these sites are now 20 years old, updating in the next 5–10 years is recommended; otherwise, the next key terrestrial habitat site report for the Northwest Territories and Nunavut will need to seriously consider the deletion of many of these sites.

For some sites where data have been updated (e.g., Snow Goose colonies at Banks Island Migratory Bird Sanctuary No. 1, Great Plain of the Koukdjuak), there is a need to obtain more precise data on other components of the breeding bird community, in particular shorebirds. For some of these sites, there is evidence that the breeding population of some species exceeds 1% of the Canadian population, and this has been noted in the text. However, additional evidence will need to be gathered in order to substantiate these suppositions.

7.2 Protection

The importance of the Northwest Territories and Nunavut to both Canadian and continental populations of migratory birds cannot be overstated. The 83 sites described here account for almost the entire breeding area for the

continental populations of a number of species of geese (Lesser Snow Goose, Greater Snow Goose, Ross's Goose, Pacific Brant, Atlantic Brant), ducks (Common Eider, King Eider), seabirds (Thick-billed Murre, Northern Fulmar, Black-legged Kittiwake, Black Guillemot), and waterbirds (Ivory Gull, Ross's Gull) (Bellrose 1980; CWS Waterfowl Committee 2003). In addition, 15 of the 47 species of shorebird known to occur in Canada breed in the Arctic (Skagen et al. 2003). Furthermore, the sites described here include all the known important areas where shorebirds concentrate for breeding (e.g., Rasmussen Lowlands, Foxe Basin Islands, Creswell Bay).

All the major goose colonies in the Northwest Territories and Nunavut have been protected by Migratory Bird Sanctuaries for at least the last 20 years. Since Alexander et al. (1991), two Migratory Bird Sanctuaries and two National Wildlife Areas have been established; however, the large majority of seabird cliffs and wetlands have seen no legal protection. There are currently a small number of seabird cliffs (e.g., Cape Searle, Akpait) and surrounding waters being considered for protection as National Wildlife Areas. In the Northwest Territories, it is possible that in response to heightened industrial activity (e.g., natural resource extraction), the pace of protected areas establishment will increase due to political pressure from Aboriginal communities, and the existence of a Protected Areas Strategy sanctioned by various levels of government. In Nunavut, although there is also the distinct possibility of increased industrial activity, primarily from the mining sector, community support for the establishment of new protected areas is more variable, and there is a lack of a formal plan or strategy to provide a framework for protected areas establishment there. Furthermore, while every effort will be made to include key terrestrial habitat sites wherever possible in both the Northwest Territories and Nunavut (e.g., Mills Lake within Edézhíé), this will not always be possible, since other criteria can come into effect when proposing candidate protected areas. The net effect in Nunavut and, to a lesser extent, the Northwest Territories is that the large majority of the 64 sites currently not found within a legally designated protected area will very likely remain unprotected by protected areas legislation.

CWS and territorial wildlife managers will need to rely on other mechanisms for the continued protection of these sites. First and foremost, there is a need to ensure that these sites are part of the environmental assessment process associated with proposals for industrial activity in their vicinity and that these sites remain off limits to such activity or that the appropriate operating conditions are applied to mitigate the effects of the activity on these sites. It is in environmental assessment that the utility of earlier cataloguing of these sites in the north (McCormick et al. 1984; Alexander et al. 1991) has become apparent. CWS and territorial habitat managers as well as environmental assessment agencies in both the Northwest Territories and Nunavut refer to these documents on a routine basis in their consideration of proposals related to mineral prospecting and exploration, tourism, and forestry. As developmental pressures continue to increase, conservation of the large majority of the key terrestrial habitat sites in the Northwest

Territories and Nunavut will need to rely on their becoming an integral component of sound land use planning in the two territories.

7.3 The future

This most recent updating and cataloguing of key migratory bird terrestrial habitat sites in the Northwest Territories and Nunavut have resulted in the addition of some new sites, resulting mainly from CWS's habitat monitoring efforts over the last decade. It is quite likely that the present listing is approaching the complete picture of key terrestrial habitat sites in the two territories, at least for waterfowl, waterbirds, and seabirds. For other groups, more surveys and monitoring are required, and, in the case of shorebirds, international effort is under way (e.g., Program for Regional and International Shorebird Monitoring). As indicated earlier, however, it is apparent that many of these sites are in serious need of updated information from which to obtain a better understanding of their present status. Next steps required to meet this, as well as to secure the long-term protection of these sites, are as follows:

1. Continue to work with the communities and other interested agencies, both government and non-government, to ensure that as many as possible of the sites that are not already legally protected are incorporated into new protected areas initiatives.
 - Communities may have traditional use areas that they wish to see protected, and they should be encouraged to prioritize, as much as possible, these areas according to the known key migratory bird terrestrial habitat in or adjacent to them.
 - Community knowledge should be used as much as possible to identify candidate sites for assessment as key terrestrial habitat sites.
2. Continue to ensure that environmental assessment in the Northwest Territories and Nunavut and the agencies responsible take into account the sites identified in this report as routine procedure in the assessment of individual development proposals, regardless of size.
 - Maintain close liaison with the Mackenzie Valley Environmental Impact Review Board, Nunavut Impact Review Board, and other land use-related boards.
 - Continue to take a proactive role in advising proponents on the sensitivities of the sites listed in this report and making clear recommendations concerning their operations and minimizing impacts (e.g., tourism, including cruise ships).
3. There should be regular population and habitat monitoring programs established at a number of sites, particularly seabird breeding cliffs and goose and seaduck colonies. Population trends can be tracked as well as impacts on habitat related to climate change, overpopulation of certain species, and other suspected stressors (e.g., contaminants).
4. Key terrestrial sites in serious need of updating on the feature species as well as additional species that may meet the 1% criterion need to be given priority in terms

of monitoring effort and the required resources.

- Systematic surveys using standard protocols are required to allow reliable comparisons among sites and to better assess temporal trends in populations of the feature species at each site.

As developmental pressures increase in both the Northwest Territories and Nunavut, it is apparent that protection of key terrestrial habitat for migratory birds will depend on community support coupled with outright protection through either appropriate legislation or closely regulated land use practices, supported by up-to-date monitoring. It is only through this approach that these sites will continue to play such a pivotal role in the international conservation of migratory birds.

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Appendices

Appendix A

Key sites for breeding and staging migratory birds in the Northwest Territories and Nunavut^a

Site number	Site name
Geese^b	
<i>Northwest Territories</i>	
NT Site 1	Prince Patrick Island
NT Site 2	Thomsen River
NT Site 3	Banks Island Migratory Bird Sanctuary No. 1
NT Site 4	Tahiryuak Lake
NT Site 5	Kagloryuak River Valley
NT Site 7	Harrowby Bay
NT Site 8	Lower Anderson River (and Mason River)
NT Site 9	Kugaluk River
NT Site 12	Mackenzie River Delta
NT Site 14	Lower Mackenzie River Islands
NT Site 15	Brackett (Willow) Lake
NT Site 16	Middle Mackenzie River Islands
NT Site 18	Mills Lake
NT Site 20	North Arm, Great Slave Lake
NT Site 22	Slave River Delta
<i>Nunavut</i>	
NU Site 20	Berlinguet Inlet
NU Site 22	South Bylot Island
NU Site 30	Great Plain of the Koukdjuak
NU Site 31	Foxe Basin Islands
NU Site 32	North Spicer Island
NU Site 34	Rasmussen Lowlands
NU Site 35	Jenny Lind Island
NU Site 36	Southwestern Victoria Island
NU Site 37	Queen Maud Gulf
NU Site 38	Middle Back River
NU Site 39	Lower Back River
NU Site 40	Thelon River
NU Site 41	Middle Quoich River
NU Site 42	McConnell River
NU Site 43	Boas River
NU Site 44	East Bay
NU Site 56	Twin Islands
NU Site 57	Northeast James Bay
NU Site 58	Akimiski Island
NU Site 59	Boatswain Bay
NU Site 60	Hannah Bay

Appendix A (cont'd)Key sites for breeding and staging migratory birds in the Northwest Territories and Nunavut^e

Site number	Site name
Swans^f	
<i>Northwest Territories</i>	
NT Site 12	Mackenzie River Delta
NT Site 14	Lower Mackenzie River Islands
NT Site 17	Southeastern Mackenzie Mountains
NT Site 18	Mills Lake
NT Site 19	Beaver Lake
NT Site 20	North Arm, Great Slave Lake
NT Site 22	Slave River Delta
<i>Nunavut</i>	
NU Site 34	Rasmussen Lowlands
NU Site 36	Southwestern Victoria Island
NU Site 37	Queen Maud Gulf
<hr/>	
Seaducks^d	
<i>Northwest Territories</i>	
NT Site 3	Banks Island Migratory Bird Sanctuary No. 1
NT Site 4	Tahiryuak Lake
NT Site 5	Kagloryuak River Valley
NT Site 10	McKinley Bay – Phillips Island
NT Site 11	Kukjuktuk and Hutchison Bays
NT Site 12	Mackenzie River Delta
NT Site 13	Ramparts River Wetlands (Tu'eyeta)
<i>Nunavut</i>	
NU Site 29	Western Cumberland Sound Archipelago
NU Site 33	Turton Island
NU Site 34	Rasmussen Lowlands
NU Site 37	Queen Maud Gulf
NU Site 44	East Bay
NU Site 46	Fraser Island
NU Site 48	Markham Bay
NU Site 51	Ungava Bay Archipelagoes
NU Site 52	Koktac River Archipelago
NU Site 53	Sleeper Islands
NU Site 54	North Belcher Islands
NU Site 55	Salikuit Islands
<hr/>	
Shorebirds^e	
<i>Northwest Territories</i>	
NT Site 3	Banks Island Migratory Bird Sanctuary No. 1
NT Site 12	Mackenzie River Delta
<i>Nunavut</i>	
NU Site 6	Polar Bear Pass
NU Site 17	Creswell Bay
NU Site 31	Foxe Basin Islands
NU Site 34	Rasmussen Lowlands
NU Site 44	East Bay
<hr/>	
Seabirds^f	
<i>Northwest Territories</i>	
NT Site 6	Cape Parry
<i>Nunavut</i>	
NU Site 1	Inglefield Mountains
NU Site 2	Sydkap Ice Field
NU Site 3	North Kent Island
NU Site 4	Seymour Island
NU Site 5	Cheyne Islands
NU Site 7	Baillie-Hamilton Island
NU Site 8	Cape Vera
NU Site 9	Skruis Point

Appendix A (cont'd)Key sites for breeding and staging migratory birds in the Northwest Territories and Nunavut^a

Site number	Site name
NU Site 10	Nirjutiqavvik (Coburg Island)
NU Site 11	Eastern Devon Island
NU Site 12	Hobhouse Inlet
NU Site 13	Cape Liddon
NU Site 14	Browne Island
NU Site 15	Prince Leopold Island
NU Site 16	Batty Bay
NU Site 18	Northwestern Brodeur Peninsula
NU Site 19	Baillarge Bay
NU Site 21	Cape Hay
NU Site 23	Cape Graham Moore
NU Site 24	Buchan Gulf
NU Site 25	Scott Inlet
NU Site 27	Qaqulluit (Cape Searle)
NU Site 28	Akpait (Reid Bay)
NU Site 45	Coats Island
NU Site 47	Digges Sound
NU Site 49	Hantzsch Island
NU Site 50	Akapatok Island

^a See text for details on numbers of each species at each site.

^b Lesser Snow Goose, Greater Snow Goose, Ross's Goose, Greater White-fronted Goose, Pacific Brant (including Grey-bellied), Atlantic Brant.

^c Trumpeter Swan, Tundra Swan.

^d Common Eider, King Eider, scaup spp., scoter spp., Long-tailed Duck.

^e Various species.

^f Includes Northern Fulmar, gulls, Black-legged Kittiwake, terns, Thick-billed Murre, Razorbill, Dovekie, Atlantic Puffin.

Appendix B

Common and scientific names of all bird species and subspecies mentioned in the text

Common name	Scientific name	Common name	Scientific name
Greater White-fronted Goose	<i>Anser albifrons</i>	Hudsonian Godwit	<i>Limosa haemastica</i>
Lesser Snow Goose	<i>Chen caerulescens caerulescens</i>	Ruddy Turnstone	<i>Arenaria interpres</i>
Greater Snow Goose	<i>Chen caerulescens atlantica</i>	Red Knot	<i>Calidris canutus</i>
Ross's Goose	<i>Chen rossii</i>	Sanderling	<i>Calidris alba</i>
Atlantic Brant	<i>Branta bernicla hrota</i>	Semipalmated Sandpiper	<i>Calidris pusilla</i>
Pacific Brant	<i>Branta bernicla nigricans</i>	Least Sandpiper	<i>Calidris minutilla</i>
Cackling Goose	<i>Branta hutchinsii</i>	White-rumped Sandpiper	<i>Calidris fuscicollis</i>
Canada Goose	<i>Branta canadensis</i>	Baird's Sandpiper	<i>Calidris bairdii</i>
Trumpeter Swan	<i>Cygnus buccinator</i>	Pectoral Sandpiper	<i>Calidris melanotos</i>
Tundra Swan	<i>Cygnus columbianus</i>	Purple Sandpiper	<i>Calidris maritima</i>
American Wigeon	<i>Anas americana</i>	Dunlin	<i>Calidris alpina</i>
American Black Duck	<i>Anas rubripes</i>	Stilt Sandpiper	<i>Calidris himantopus</i>
Mallard	<i>Anas platyrhynchos</i>	Buff-breasted Sandpiper	<i>Tryngites subruficollis</i>
Blue-winged Teal	<i>Anas discors</i>	Long-billed Dowitcher	<i>Limnodromus scolopaceus</i>
Northern Pintail	<i>Anas acuta</i>	Red-necked Phalarope	<i>Phalaropus lobatus</i>
Canvasback	<i>Aythya valisineria</i>	Red Phalarope	<i>Phalaropus fulicarius</i>
Greater Scaup	<i>Aythya marila</i>	Pomarine Jaeger	<i>Stercorarius pomarinus</i>
Lesser Scaup	<i>Aythya affinis</i>	Parasitic Jaeger	<i>Stercorarius parasiticus</i>
King Eider	<i>Somateria spectabilis</i>	Long-tailed Jaeger	<i>Stercorarius longicaudus</i>
Common Eider (Pacific)	<i>Somateria mollissima v-nigra</i>	Bonaparte's Gull	<i>Larus philadelphia</i>
Common Eider (Northern)	<i>Somateria mollissima borealis</i>	Mew Gull	<i>Larus canus</i>
Common Eider (Hudson Bay)	<i>Somateria mollissima sedentaria</i>	Ring-billed Gull	<i>Larus delawarensis</i>
Surf Scoter	<i>Melanitta perspicillata</i>	California Gull	<i>Larus californicus</i>
White-winged Scoter	<i>Melanitta fusca</i>	Herring Gull	<i>Larus argentatus</i>
Black Scoter	<i>Melanitta nigra</i>	Thayer's Gull	<i>Larus thayeri</i>
Long-tailed Duck	<i>Clangula hyemalis</i>	Iceland Gull	<i>Larus glaucoides</i>
Bufflehead	<i>Bucephala albeola</i>	Glaucous Gull	<i>Larus hyperboreus</i>
Common Goldeneye	<i>Bucephala clangula</i>	Sabine's Gull	<i>Xema sabini</i>
Common Merganser	<i>Mergus merganser</i>	Black-legged Kittiwake	<i>Rissa tridactyla</i>
Red-breasted Merganser	<i>Mergus serrator</i>	Ross's Gull	<i>Rhodostethia rosea</i>
Red-throated Loon	<i>Gavia stellata</i>	Ivory Gull	<i>Pagophila eburnea</i>
Pacific Loon	<i>Gavia pacifica</i>	Caspian Tern	<i>Sterna caspia</i>
Common Loon	<i>Gavia immer</i>	Common Tern	<i>Sterna hirundo</i>
Yellow-billed Loon	<i>Gavia adamsii</i>	Arctic Tern	<i>Sterna paradisaea</i>
Northern Fulmar	<i>Fulmarus glacialis</i>	Black Tern	<i>Chlidonias niger</i>
Rough-legged Hawk	<i>Buteo lagopus</i>	Dovekie	<i>Alle alle</i>
Gyrfalcon	<i>Falco rusticolus</i>	Thick-billed Murre	<i>Uria lomvia</i>
Peregrine Falcon	<i>Falco peregrinus</i>	Razorbill	<i>Alca torda</i>
American Coot	<i>Fulica americana</i>	Black Guillemot	<i>Cephus grylle</i>
Sandhill Crane	<i>Grus canadensis</i>	Atlantic Puffin	<i>Fratercula arctica</i>
Whooping Crane	<i>Grus americana</i>	Snowy Owl	<i>Bubo scandiacus</i>
Black-bellied Plover	<i>Pluvialis squatarola</i>	Horned Lark	<i>Eremophila alpestris</i>
American Golden-Plover	<i>Pluvialis dominica</i>	American Pipit	<i>Anthus rubescens</i>
Semipalmated Plover	<i>Charadrius semipalmatus</i>	American Tree Sparrow	<i>Spizella arborea</i>
Lesser Yellowlegs	<i>Tringa flavipes</i>	Savannah Sparrow	<i>Passerculus sandwichensis</i>
Eskimo Curlew	<i>Numenius borealis</i>	White-crowned Sparrow	<i>Zonotrichia leucophrys</i>
Whimbrel	<i>Numenius phaeopus</i>		

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Northwest Territories

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Nunavut

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Akpatok Island (NU Site 50)
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