

COSEWIC
Assessment and Update Status Report

on the

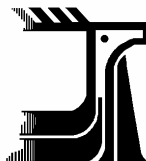
Ross's Gull
Rhodostethia rosea

in Canada



THREATENED
2007

COSEWIC
COMMITTEE ON THE STATUS OF
ENDANGERED WILDLIFE
IN CANADA



COSEPAC
COMITÉ SUR LA SITUATION
DES ESPÈCES EN PÉRIL
AU CANADA

COSEWIC status reports are working documents used in assigning the status of wildlife species suspected of being at risk. This report may be cited as follows:

COSEWIC 2007. COSEWIC assessment and update status report on the Ross's Gull *Rhodostethia rosea* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 24 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

Previous reports:

COSEWIC 2001. COSEWIC assessment and update status report on the Ross's Gull *Rhodostethia rosea* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 13 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

Alvo, R., D. McRae, S. Holohan and G. Divoky. 1996. Update COSEWIC status report on the Ross's Gull *Rhodostethia rosea* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. 1-15 pp.

Macey, A. 1981. COSEWIC status report on the Ross's Gull *Rhodostethia rosea* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. 1-20 pp.

Production note:

COSEWIC would like to acknowledge Richard Knapton for writing the update status report on the Ross's Gull *Rhodostethia rosea* in Canada, prepared under contract with Environment Canada, overseen and edited by Dr. Marty L. Leonard, Co-chair, COSEWIC Birds Species Specialist Subcommittee.

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Également disponible en français sous le titre Évaluation et Rapport de situation du COSEPAC sur la Mouette rosée (*Rhodostethia rosea*) au Canada – Mise à jour.

Cover illustration:

Ross's Gull — Photograph provided by Christian Artuso.

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Catalogue No. CW69-14/14-2007E-PDF
ISBN 978-0-662-45989-7

 Recycled paper



COSEWIC Assessment Summary

Assessment Summary – April 2007

Common name

Ross's Gull

Scientific name

Rhodostethia rosea

Status

Threatened

Reason for designation

In Canada, this species is known to occur in small numbers in very few locations. Threats include disturbance in some breeding areas and changes in ice and snow patterns associated with climate change.

Occurrence

Nunavut, Manitoba

Status history

Designated Special Concern in April 1981. Status re-examined and confirmed in April 1996. Status re-examined and designated Threatened in November 2001 and in April 2007. Last assessment based on an update status report.



COSEWIC Executive Summary

Ross's Gull *Rhodostethia rosea*

Species information

Ross's Gull (*Rhodostethia rosea*) is a small, tern-like gull with a buoyant flight. It can be distinguished by a unique combination of a wedge-shaped tail, grey underwing and a narrow black collar that completely encircles the rather dove-like head. The sexes are alike. In breeding plumage, the head and body take on a rose colour strongest on the breast and belly. In flight, the dark grey of the underwing coverts contrasts with a broad white trailing edge to the wing. The immature plumage has black outer primaries and a broad black diagonal band across the inner wing, forming a broad white triangle on the rear wing, and a broad black tail band.

Distribution

Ross's Gull is an Arctic species with a circumpolar distribution. It breeds primarily in northeast Siberia, with small scattered colonies in Greenland, Svalbard, and Arctic and subarctic Canada. In Canada, only four nesting locations have been found, three in Nunavut and one in Manitoba. Winter distribution is poorly known but likely populations winter along the edge of the pack ice in the northern Bering Sea and the Sea of Okhotsk, and in the open waters of the Arctic.

Habitat

Ross's Gulls breed in widely varying Arctic habitats, from marshy tundra to gravel reefs. All sites are located near water, and many are close to Arctic Tern (*Sterna paradisaea*) colonies. The site used in Churchill, Manitoba, consists of hummocks supporting grasses, lichens and dwarf willows, lower areas with grasses and sedges, small pools and some shallow lakes. Occupied breeding sites on the Cheyne Islands and in Penny Strait were on low-lying gravel reefs, close to nearby polynyas, which attract birds when open in late spring.

Biology

Ross's Gulls are thought to reach sexual maturity in their second year. Weather conditions affect the timing of nestings; in Canada, poor weather conditions in spring in

some years may dissuade the birds from nesting at all. Nests can be a depression in the ground (a scrape), a moss cup, or located in sedge tussocks. Clutch size is usually 3. Both parents incubate nests, for 21-22 days and chicks fledge at 20+ days after hatch. Nests are often far apart from each other, frequently among colonies of Arctic Terns, and the number of nests in each colony is usually up to 8 pairs, and has never exceeded 20 pairs.

Ross's Gull eggs and chicks are preyed upon by both avian and mammalian predators, and nesting success is low. The gulls are probably opportunistic feeders, at sea, feeding on small fish and invertebrates and during the breeding season on insects.

Dispersal/migration

After breeding, Ross's Gulls move north into the Arctic Ocean, apparently exploiting drift ice and shelf breaks as far north as there is open water up to the North Pole. There is a pronounced fall migration eastwards past Point Barrow, Alaska, to feeding grounds in the Beaufort Sea in fall, and a return movement westward in early winter in response to ocean freezing and foraging opportunities at the edge of the pack ice.

Population sizes and trends

Censuses of Siberian breeding grounds indicate a population of about 50,000 Ross's Gulls and it is considered vulnerable/apparently secure and not globally threatened. There is little recent information to indicate if the global population continues to be stable. There appears to have been a significant increase in the number of Ross's Gulls reported south of traditional wintering areas in the last thirty years, for example, in the British Isles, Iceland, southern Canada and the United States outside Alaska.

In Canada, the Ross's Gull occurs at low population numbers, scattered throughout the low and high Arctic region, with the total known breeding population in any one year ranging from 0-10 pairs. The Churchill population has ranged from 1-5 pairs since 1980, the colony at the Cheyne Islands peaked at 20 individuals when 6 pairs and 8 unpaired birds were present in 1978, and possibly 10 individuals (5 pairs) were present at the unnamed island in Penny Strait in 2005. In 2006, 3 pairs were found in locations on the Cheyne Islands where they had nested previously, and one pair was relocated on the unnamed island (G. Gilchrist, pers. comm. 2006).

Limiting factors and threats

Oil development in the Beaufort and Chukchi Seas poses a potential threat owing to the large concentrations of birds during fall in the Beaufort Sea. Breeding sites in Canada are relatively remote and are not at risk from industrial development at present, although there are known significant oil and gas reserves in the Canadian Arctic that might be exploited at some future date.

Given the rate at which climate change is affecting the Arctic, any obligate Arctic-adapted species should be considered under imminent threat. Annual snow and ice patterns are probably major limiting factors influencing the decision to breed in any given year, since one critical variable is the presence of open water close to the nesting site. Climate change represents an unknown effect on the reproductive ecology of Ross's Gulls.

Disturbance by humans at nest sites has caused nest abandonment, and there likely still is a black market for the sale of Ross's Gull eggs. Fledging rates are low, with hypothermia invoked as a frequent cause of chick mortality.

Special significance of the species

The Ross's Gull has a remarkable mystique among the bird-watching community for its rarity, resulting in local economic boosts for the community (see Churchill). Subsistence harvest of Ross's Gulls in Canada is probably negligible.

Existing protection

Ross's Gull was designated by COSEWIC in November 2001 as Threatened. The *Species at Risk Act* (SARA) prohibits damaging or destroying the residence (= nest) of Ross's Gull. It and its nest are protected under the *Migratory Birds Convention Act* of 1994. No collection of adults, young or eggs is allowed. Hunting of Ross's Gull is also prohibited in Russia. It also receives some protection from the *Canada National Parks Act* and the Churchill Special Conservation Area.



COSEWIC HISTORY

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) was created in 1977 as a result of a recommendation at the Federal-Provincial Wildlife Conference held in 1976. It arose from the need for a single, official, scientifically sound, national listing of wildlife species at risk. In 1978, COSEWIC designated its first species and produced its first list of Canadian species at risk. Species designated at meetings of the full committee are added to the list. On June 5, 2003, the *Species at Risk Act* (SARA) was proclaimed. SARA establishes COSEWIC as an advisory body ensuring that species will continue to be assessed under a rigorous and independent scientific process.

COSEWIC MANDATE

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assesses the national status of wild species, subspecies, varieties, or other designatable units that are considered to be at risk in Canada. Designations are made on native species for the following taxonomic groups: mammals, birds, reptiles, amphibians, fishes, arthropods, molluscs, vascular plants, mosses, and lichens.

COSEWIC MEMBERSHIP

COSEWIC comprises members from each provincial and territorial government wildlife agency, four federal entities (Canadian Wildlife Service, Parks Canada Agency, Department of Fisheries and Oceans, and the Federal Biodiversity Information Partnership, chaired by the Canadian Museum of Nature), three non-government science members and the co-chairs of the species specialist subcommittees and the Aboriginal Traditional Knowledge subcommittee. The Committee meets to consider status reports on candidate species.

DEFINITIONS

Wildlife Species	A species, subspecies, variety, or geographically or genetically distinct population of animal, plant or other organism, other than a bacterium or virus, that is wild by nature and is either native to Canada or has extended its range into Canada without human intervention and has been present in Canada for at least 50 years.
Extinct (X)	A wildlife species that no longer exists.
Extirpated (XT)	A wildlife species no longer existing in the wild in Canada, but occurring elsewhere.
Endangered (E)	A wildlife species facing imminent extirpation or extinction.
Threatened (T)	A wildlife species likely to become endangered if limiting factors are not reversed.
Special Concern (SC)*	A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
Not at Risk (NAR)**	A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.
Data Deficient (DD)***	A category that applies when the available information is insufficient (a) to resolve a species' eligibility for assessment or (b) to permit an assessment of the species' risk of extinction.

* Formerly described as "Vulnerable" from 1990 to 1999, or "Rare" prior to 1990.

** Formerly described as "Not In Any Category", or "No Designation Required."

*** Formerly described as "Indeterminate" from 1994 to 1999 or "ISIBD" (insufficient scientific information on which to base a designation) prior to 1994. Definition of the (DD) category revised in 2006.



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The Canadian Wildlife Service, Environment Canada, provides full administrative and financial support to the COSEWIC Secretariat.

**Update
COSEWIC Status Report**

on the

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Rhodostethia rosea

in Canada

2007

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SPECIES INFORMATION

Name and classification

English name:	Ross's Gull
French name:	Mouette rosee, Mouette de Ross
Scientific name:	<i>Rhodostethia rosea</i>
Other common names:	Rosy Gull (Burger and Gochfeld 1996)
Previous name:	Ross' Gull
Classification:	Class – Aves Order – Charadriiformes Suborder – Lari Family – Laridae Genus – <i>Rhodostethia</i> Species – <i>rosea</i>

This is a monotypic genus, and there are no known subspecies.

Taxonomy: *Larus roseus* MacGillivray, 1824: Melville Peninsula, Canada. The first specimen of a Ross's Gull was collected by Sir James Clark Ross in 1823. Ross spent 15 years (1818 – 1833) in search of the Northwest Passage, sailing under Captains William Parry and John Ross. The Ross's Gull remained an enigma until 1905, when the Russian explorer Sergius Buturlin discovered the nesting grounds along the Kolyma River in Siberia (Blomqvist and Elander 1981, Bechet *et al.* 2000).

Taxonomic relationships appear to be rather obscure. Ross's Gull resembles the Little Gull (*Larus minimus*) in size and plumage sequence, but with a very different adult plumage. Morphometric analysis suggests that it is an early derivative of a primitive or a hooded larid (Burger and Gochfeld 1995).

Morphological description

Ross's Gull is a tern-like gull with a buoyant tern-like flight. Compared with other similar gulls, it has a unique combination of wedge-shaped tail, grey underwing and a black nuchal collar. Sexes are alike in size and plumage. In breeding plumage, much of the head and body takes on a rose colour strongest on the breast and belly. The rose colour fades with wear, but is still evident on adult birds into October. The narrow black collar completely encircles the rather dove-like head. In flight, the dark grey of the underwing coverts contrasts with a broad white trailing edge to the wing. Feet are red and the bill black. Non-breeding adults lack the black collar and the rosy hue, and develop a light grey crown, dark flecks around the eye, and a small black auricular spot. The immature plumage has black outer primaries and a broad black diagonal band across the inner wing, forming a broad white triangle on the rear wing, and a black tail band.

Birds in juvenile plumage are dusky brown overall, with white belly and light edges to dark back feathers, giving a scaly appearance. The cap is dark, throat and eyeline

white, and tail white with black tips to elongated middle feathers. There is a conspicuous black bar across wings, making an "M" across the back visible in flight. A dark spot occurs behind the eye, and legs are flesh-brown. In first Winter (Basic I), the back is pale grey, head and underparts white, with a black spot behind and dark areas around the eye. The tail, upper wing and leg colour is similar to the juvenile plumage. First summer (Alternate I) plumage looks like an adult with immature wings.

Ross's Gulls measure 29 – 32 cm in length, 120 – 250 g in mass, and have a wingspan of 82 – 92 cm. In dimensions this species is most similar to Sabine's Gull (*Xema sabinii*) and Bonaparte's Gull (*L. philadelphia*).

Genetic description

Royston *et al.* (2006) are using mitochondrial DNA sequences from ND4, ND4L, 12S and 16S to investigate the extent of gene flow amongst colonies in both Ross's and Ivory (*Pagophila eburnea*) Gulls. Preliminary results indicate that Ross's Gull genetic diversity appears to be higher than that of Ivory Gull.

DISTRIBUTION

Global range

The Ross's Gull is primarily an Arctic and subarctic species with a circumpolar distribution (Macey 1981). The species breeds in Russia, and nests locally and perhaps irregularly in Greenland, Svalbard and Canada (Burger and Gochfeld 1996). The main breeding grounds are found in northeastern Siberia, from the Taymyr Peninsula east to the River Kolyma (Macey 1981), with additional breeding locations on Spitsbergen Island in Svalbard, Norway, Peary Land and Disko Bay in Greenland, and in northern Canada (Rand 1947, Blomqvist and Elander 1981, Alvo *et al.* 1996, Béchet *et al.* 2000, Mallory *et al.* 2006). The wintering distribution is still poorly known but likely populations winter along the edge of the pack ice in the Pacific Basin from Anadyr Bay and St. Lawrence Island in the northern Bering Sea south along both coasts of the Kamchatka Peninsula, and from the northern Sea of Okhotsk to Sakhalin Island and the southern Kurile Islands, and in the open waters of the Arctic (NatureServe 2005).

There appears to have been a significant increase in the number of Ross's Gulls reported south of traditional wintering areas in the last 30 years. In the British Isles, the species occurs almost annually now with a maximum of 8 in 2002 (British Birds Rarities Committee 2006), in Iceland there have been 40 records up to 2002, most in the last 10 years (Icelandic Rarities Committee 2002), and there are about 25 records in the lower 48 states of the U.S.A., all since the famous individual at Newburyport, Massachusetts, in 1975 (BirdWeb 2006). Even granted variables such as greater awareness, increase in birders and so on, it appears that there has been an actual increase in the number of Ross's Gulls in the Northern Atlantic, perhaps indicating a shift in wintering patterns of part of the Siberian population.

Canadian range

There are four known breeding localities in Canada, three in Nunavut Territory and one in Manitoba at Churchill (Figure 1).

Cheyne Islands

The Cheyne Islands (76° 18'N, 97° 30'W) (IBA site NU 049) consist of three islands of similar size, oriented north-south with approximately two km of open water between each island. North, Middle, and South Cheyne islands lie five km off the eastern coast of Bathurst Island, near Reindeer Bay. All three islands are of low relief (up to three m above sea level) and are composed of alluvial material. The islands are located on the west side of Penny Strait; several small polynyas develop in May or June on the east side of this strait (MacDonald 1978).

Prince Charles Island

A Ross's Gull nest was discovered at the northwest corner of Prince Charles Island, Nunavut (68° 13'N, 76° 29'W) on 8 July 1997 (Bechet *et al.* 2000). This interesting find was only 200 km from where Ross collected the type specimen in June 1823, on the east coast of Melville Peninsula. Single Ross's Gulls were tentatively identified on the southeastern coast of Prince Charles Island in 1984 (A.J. Gaston, pers. comm., cited in Bechet *et al.* 2000). Prince Charles Island is a large, low-lying island with an area of 9,521 km² (3,676 sq mi). It is located in Foxe Basin, off the west coast of Baffin Island, in the Qikiqtaaluk Region of Nunavut, Canada. <http://www.answers.com/topic/prince-charles-island>

Penny Strait

A previously undiscovered colony of four and possibly five breeding pairs was located on an unnamed island in Penny Strait in 2005 (75° 08'N, 96° 30'W) (Mallory *et al.* 2006). This location is only 80 km from the nesting sites on the Cheyne Islands. The island is about 3 km².

Manitoba

The first sighting for Manitoba was a photographed adult at Churchill 18 to 23 June 1978 (Manitoba Avian Research Committee 2003). In 1980, three nests were located (58° 47'N, 94° 12'W) (Chartier and Cooke 1980). From 1980 through 1995, Ross's Gulls nested almost annually in the area around Churchill (Alvo *et al.* 1996, Manitoba Avian Research Committee 2003, R.F. Koes, pers. comm. 2006, IBA Site MB 003). Since then, breeding has become sporadic, with only single birds reported some years and up to four in other years, including 2005. There have been persistent reports of nestings upstream from the end of the Hydro Road along the Churchill River, where apparently there were five nests in 2002, although after the mid-1980s locations of nests have usually been kept secret (R. Koes, pers. comm. 2006).

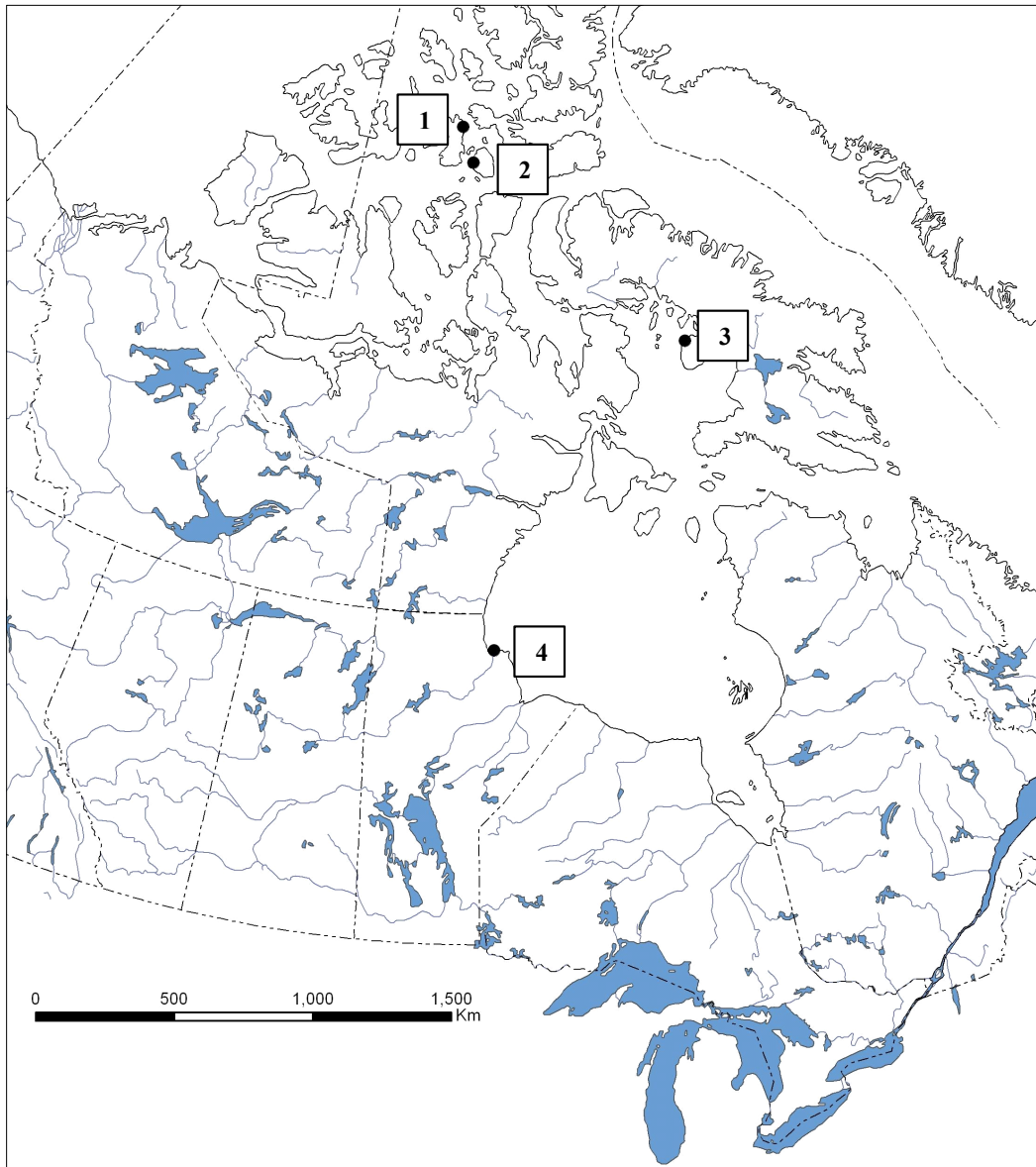


Figure 1. Known breeding occurrences of Ross's Gulls in Canada. Locations from the top are: 1. The Cheyne Islands, 2. Unnamed island in Penny Strait, 3. Prince Charles Island, 4. Churchill area. Modified from Environment Canada (Edmonton)'s data base.

Summer records away from the Nunavut sites in the Canadian Arctic include six specimens in breeding plumage taken on Seymour Island, Nunavut ($76^{\circ}08'N$, $101^{\circ}03'W$) in 1974 and 1975 (CMNAV 60081, 60082, 60083, S2074, S584, S845) (Macey 1981, M. Gosselin, pers. comm. 2006). There were sight records in 1973 at the McConnell River, Nunavut (Macey 1981, Alvo *et al.* 1996), and further sight records on the Boothia and Melville Peninsulas, Cornwallis Island, Prince Leopold Island, and Broughton Island (Godfrey 1986). A previous record of nesting Ross's Gulls on the Meighen Islands was subsequently shown to be erroneous (Macey 1981, Alvo *et al.* 1996).

Other summer records in Nunavut include East Bay, Southampton Island, in 2000 (Stenhouse *et al.* 2001), and Cambridge Bay on 28 June 1994, a sub-adult (Alvo *et al.* 1996) and on 28 June 2000, chasing a Long-tailed Jaeger (*Stercorarius longicaudus*) (J. Richards, pers. comm. 2006). Further records in the Canadian Arctic were of a probable adult female Ross's Gull taken on 14 June 1985 at Arctic Bay (73°01'N, 85°07'W) on Baffin Island by Glen Williams (CMNAV 86167, M. Gosselin, pers. comm. 2006),.

Status in other parts of Canada

Northwest Territories - Records from the Northwest Territories (NT) are remarkably few, especially in light of the autumnal migration of Ross's Gulls along the north shore of Alaska. The species is reported from the Mackenzie Delta region and may occur at the Taglu site and the Niglintgak site (A. Thompson, pers. comm. 2006, BSIMPI 2002). However, there are no known specimens or documented records of Ross's Gulls from the NT (J. Hines, pers. comm. 2006), nor from specific parts of the NT, such as the Inuvialuit Settlement Region (K. Thiesenhausen, pers. comm. 2006).

British Columbia – There is one record, a bird filmed and photographed at Clover Point, Victoria, British Columbia, on 27 October 1966 and 9 November 1966 (D. Fraser, pers. comm. 2006).

Ontario – The first record for subarctic Ontario occurred from 14 to 23 May, 1983, at Moosonee, an adult apparently migrating with Bonaparte's Gulls (*L. philadelphia*) (Abraham 1984). There was a report of a Ross's Gull on the Winisk River in August 2004 (D. Sutherland, pers. comm. 2006). This record is of interest as there appears to be suitable breeding habitat, such as sedge-bordered marshy taiga lakes with Arctic Tern (*Sterna paradisaea*) colonies, in the general vicinity of Peawanuck and elsewhere in the northern Hudson Bay Lowland, although considerable scouting of the area has produced no results (D. Sutherland, pers. comm. 2006). Elsewhere in Ontario, there have been a few records on the lower Great Lakes, such as at Port Weller, Lake Ontario, and Point Pelee, Lake Erie.

Quebec – In Quebec, the Ross's Gull is considered an "occasional visitor" (D. Banville, pers. comm. 2006). There are only five records, three in May and June, and two in November and December, from Sainte-Anne-des-Monts in 1976, Metabetchouan in 1991, Chambly in 1994 and 1995, and Bergeronnes in 1995 (David 1996).

Alberta, Saskatchewan, New Brunswick and Prince Edward Island – There are no known records of Ross's Gulls from these provinces and the species is classed as hypothetical (Semenchuk 1992, Smith 1996).

Nova Scotia – There are four records from Nova Scotia; December 1987 and June 1988 at the Canso Causeway, July 1995 at Ile Madame, and December 1995 at Chebucto Head (I. McLaren, pers. comm. 2006).

Newfoundland and Labrador – An adult in basic plumage was shot off Fogo Island, Newfoundland, on 18 December 1976 (CMNAV 70031) (with location given as ‘Seal Cove’) (Godfrey 1986, M. Gosselin, pers. comm. 2006, P. Linegar, pers. comm. 2006). Otherwise, records are of a first summer bird at Trepassey in May 1985, an adult or possible second winter bird photographed at Stephenville in January 1986 feeding in a sewage carrying stream, an adult 3 km off L’Anse-aux-Meadows in September 1986 and a summer plumaged adult in the harbour there in August 1991, an adult in Cow Head Harbour in December 1991, and an adult in breeding plumage near Ramea Harbour in June 1993 (P. Linegar, pers. comm. 2006).

Extent of occurrence and area of occupancy

The Extent of Occurrence (EO) is 300,000 km², calculated by including areas of all breeding locations (see Figure 1). The Area of Occupancy (AO) is 31,000 km², calculated by using a 50km radius around each of the four known breeding locations.

HABITAT

Habitat requirements

Ross’s Gulls are known to breed in a variety of habitats, the most common being marshy wetland and subarctic and boreal tundra (Blomqvist and Elander 1981). They also nest in High Arctic Tundra and gravel reefs (Macey 1981, Bechet *et al.* 2000). Nesting requirements include access to open water such as lakes, ponds, polynyas or open leads in the pack ice and frequently near Arctic Tern colonies (Macey 1981, Béchet *et al.* 2000).

Principal habitat in the bird’s Russian range is where melting snow on tundra underlain by permafrost creates a muddy boggy terrain interspersed with shallow pools dotted with sedge *Carex* and moss, and with small low islets partly within small trees *Alnus* and *Salix* (Cramp *et al.* 1983, Densley 1991). All sites are located near water, and many are close to Arctic Tern colonies and sometimes to nests of medium-sized shorebirds such as Spotted Redshank (*Tringa erythropus*) and Ruff (*Philomachus pugnax*). The site used in Churchill is evidently very similar to the lowland habitat in Kolyma, Russia; it consists of hummocks supporting grasses, lichens and dwarf willows, lower areas with grasses and sedges, small pools and some shallow lakes (Chartier and Cooke 1980, Macey 1981, Alvo *et al.* 1996).

On the Cheyne Islands, Nunavut, nests were placed on low-lying gravel islands, each about 400 m long and 1 m high, supporting freshwater ponds and vegetation such as mosses, a nesting habitat quite different from the low-lying tundra of the bird’s

Siberian range or the Churchill site. The nest site on the unnamed island in Penny Strait was on a gravel reef/island, near a colony of Arctic Terns; one nest was located on the elevated ridge running the length of the reef (Mallory *et al.* 2006). The nest on Prince Charles Island was located on a small island in a lake, on an elevated hump covered with moss and dwarf willow, in the transition zone from the wet coastal plain to the drier interior of the island, an area consisting of a network of medium-sized lakes on a low plateau on top of raised beaches (Bechet *et al.* 2000).

Habitat trends

There appears to be no evidence that nesting habitats have been lost or created which would impact nesting Ross's Gulls. It is possible that climate change could affect the permafrost layer, thereby changing the overlying structure and composition of the tundra, and rising sea levels could impact the low-lying gravel islands.

Habitat protection/ownership

The Churchill Special Conservation Area (35,823.1 ha), designated under the Manitoba Wildlife Act, was established to conserve and protect Ross's Gull nesting habitat around Churchill. This area is no longer used by Ross's Gulls. The current Churchill breeding location is more difficult to access, providing some protection for the bird. The northern breeding locations in Nunavut are also partially protected because of their remote and inaccessible locations.

BIOLOGY

Life cycle and reproduction

Ross's Gulls are thought to reach sexual maturity in their second year. Weather conditions affect the timing of nesting. Hatchings have occurred in Canada during the second week of June, although the usual hatch date is in mid-July (Macey 1981). Presumably poor weather conditions in spring in some years may dissuade the birds from nesting.

Ross's Gull nests are approximately 10-15 cm in diameter and can be a depression in the ground (a scrape), a moss cup, or located in sedge tussocks (Macey 1981). Nests are lined with vegetation such as dry grass, sedge, moss, willow or birch leaves, or seaweed (Macey 1981) or unlined with vegetation (Mallory *et al.* 2006). Eggs are olive with faint reddish-brown markings and are approximately 30 x 43-46 mm. Clutch size is usually 3 (range 1-3) (Macey 1981, Mallory *et al.* 2006). Nests are incubated by both parents, for 21-22 days and chicks fledge at 20+ days after hatch (Ehrlich *et al.* 1988).

Studies conducted on nesting colonies of Ross's Gulls in their Siberian range (e.g., Degtyarev *et al.* 1997) produced the following results. The average nearest-neighbour

distance was 43 m, and some nests were separated by 100 m or more (n = 85). Colonies never exceeded 20 breeding pairs, and the usual number was between two and eight pairs. After five days, chicks were visited by the adults only for feeding, and by 15 days chicks were fed only four times a day. From this time to fledging, at about 20 days, the colony appeared to be deserted; the adults were absent, foraging elsewhere, and the chicks were camouflaged, hiding in the undergrowth. The colonies were usually quiet, since calls were only given in defense against predators.

Predation

Ross's Gull eggs and chicks are preyed upon by Glaucous Gulls (*L. hyperboreus*), Herring Gulls (*L. argentatus*), jaegers (*Stercorarius* spp.), Arctic fox (*Alopex lagopus*), weasels (*Mustela* spp.), and polar bears (*Ursus maritimus*) (Densley 1991, Alvo *et al.* 1996). Adults have been taken by Peregrine Falcons (*Falco peregrinus*) (Burger and Gochfeld 1996).

Diet

Ross's Gulls are probably opportunistic feeders. At sea, the birds forage at the edge of the pack ice, where a large proportion of their food is comprised of Arctic cod (*Boreogadus saida*); 79% of Ross's Gulls (n = 24) collected in the Chukchi Sea in September and October contained Arctic cod (Divoky 1976). Amphipods were also frequently taken, especially *Apherusa glacialis* (Divoky 1976), but a wide variety of other prey including Coleoptera, Decapods, Polychaetes, Copepods, Euphausiids and Mysids were also found. On nesting grounds in Siberia, the main food of Ross's Gulls is insects (Macey 1981). Bechet *et al.* (2000) observed adult Ross's Gulls hovering low over the water or walking along the shoreline, probably foraging on insects and small invertebrates, and at Churchill, birds were observed taking small items from below the surface of ponds (Macey 1981). Other reports of diet and foraging include feeding on wave-washed "scum" along beaches, presumably picking up plankton; feeding on walrus (*Odobenus rosmarus*) dung; and gathering around dead animals (Burger and Gochfeld 1996).

Foraging

Ross's Gulls may forage in small loose flocks or solitarily, occasionally joining Sabine's Gulls and phalaropes. They will follow ships that are breaking through ice, capturing organisms on the undersurface of disturbed ice. Ross's Gulls feed by aerial dipping, sometimes surface dipping, and walking (Burger and Gochfeld 1996).

Physiology

There are no studies to date on Ross's Gull physiology.

Dispersal/migration

Non-breeding birds in summer.

During July, nonbreeding Ross's Gulls move into the Arctic Ocean north of Norway and Russia, probably coming from Russian breeding grounds (Hjort *et al.* 1997). The birds apparently exploit drift ice and shelf breaks as far north as there is open water, up to the North Pole. The gulls associate with shelf-breaks owing to high food productivity resulting from upwelling of nutrients. In 1996, Hjort *et al.* (1997) reported Ross's Gulls to be the most common bird in the central parts of the Arctic Ocean, north at least to 87°30'N, with large concentrations in the bathymetric corner between shelf-breaks and the St. Anna trough. Meltofte *et al.* (1981) also reported large numbers in the Arctic Ocean in July, from Franz Joseph Land, Svalbard and Greenland north to 82°30'.

Migration

The fall migration eastwards past Point Barrow on the north shore of Alaska has been known for some time (Fisher and Lockley 1954, Burger and Gochfeld 1996), and estimates of 20,000 birds have been reported heading east to previously unknown destinations. It is now known that Ross's Gulls move east from the Chukchi Sea to the area around Point Barrow, starting in August and peaking in late September, and then to feeding grounds in the Beaufort Sea in late September or early October. There is a return movement westward in late October and early November, presumably moving in response to the freezing of the ocean and foraging opportunities at the edge of the pack ice. The gulls move south via the Bering Strait to winter in the Bering Sea and Sea of Okhotsk (Zubakin *et al.* 1990, Degtyarev *et al.* 1997), although the wintering grounds are still poorly known.

Interspecific interactions

During the breeding season, Ross's Gulls frequently nest in or close by colonies of Arctic Terns, presumably taking advantage of the predator-mobbing behaviour of the terns. Nests located in Penny Strait were close to Arctic Tern colonies and sometimes nests of Sabine's Gulls; Sabine's Gulls appear to be much more aggressive toward humans than are Ross's Gulls (Mallory *et al.* 2006). However, Ross's Gulls will defend their eggs and young, despite their "invisibility" (Burger and Gochfeld 1996, Degtyarev *et al.* 1997), and will show vigorous tern-like nest defence towards humans (Mallory *et al.* 2006).

Little is known about the behaviour of Ross's Gulls away from their breeding grounds. Small loose flocks have been reported foraging along the edge of the pack-ice with Sabine's Gulls, with little interaction among flock members. Individual Ross's Gulls at Churchill have been harassed by Bonaparte's Gulls when the two are feeding close together (pers. obs.) but the harassment tends to be momentary.

Adaptability

The level at which Ross's Gulls will tolerate disturbance by humans is not known. Disturbance by bird-watchers, photographers, and tourists is a potential threat to the Ross's Gull in Canada (Macey 1981). The trends emerging from the nesting sites at Churchill provide an indication of tolerance levels in this species. At least one nest at Churchill was abandoned because a photographer was too close (Alvo *et al.* 1996). However, Ross's Gulls are reported to nest successfully beside hunting camps in Russia (Alvo *et al.* 1996). Such contradictions indicate a need to investigate tolerance of disturbance levels at all stages of the breeding cycle.

POPULATION SIZES AND TRENDS

Search effort

The discovery of two of the known breeding sites in Canada of Ross's Gulls (the Cheyne Islands and Churchill) was not a result of systematic and organized searches for the species but rather fortuitous discoveries. The pair that nested on Prince Charles Island in 1997 was found during intensive terrestrial and aerial surveys of Prince Charles and Air Force Islands during the summers of 1996 and 1997 (Bechet *et al.* 2000). A.J. Gaston (pers. comm. 2006), who surveyed parts of Prince Charles Island in the 1980s, indicates "(t)he discovery of the breeding site on Prince Charles Island was made on the first serious land bird survey of an island the size of Prince Edward Island. Other islands in Foxe Basin with much the same sort of terrain have never been surveyed on the ground, or at most only a small proportion has been surveyed." Ross's Gulls were twice identified on a different part of Prince Charles Island by aerial surveys in 1984 (A.J. Gaston, pers. comm. 2006), although reports from other aerial surveys and visits to Prince Charles Island did not mention the species (Ellis and Evans 1960, Reed *et al.* 1980, Morrison 1997). Such information underscores the uncertainty about the status of this species in Canada.

The fourth known site, the unnamed island in Penny Strait, was a result of research and monitoring surveys of marine birds in High Arctic Canada (Mallory *et al.* 2006). The Canadian Wildlife Service, as part of research and monitoring of marine birds in High Arctic Canada, have conducted surveys for Ross's Gulls at known and potential nesting locations in Nunavut from 2002 through 2006 (Mallory *et al.* 2006). Surveys were carried out on islands in Penny Strait on one day each year between 1 and 16 July, from a Bell 206 L4 helicopter. In Penny Strait, 16 small islands were surveyed, and in 2003 – 2006 Seymour Island and the Cheyne Islands were resurveyed (Mallory *et al.* 2006). These surveys did not result in any sightings of Ross's Gulls between 2002 and 2004, but surveys in 2005 resulted in the discovery of the colony on the small unnamed island east of Crozier Island in Penny Strait, a location also surveyed between 2002 and 2004. In 2006, nesting pairs were relocated on the unnamed island and on the Cheyne Islands, the first time since the late 1970s (G. Gilchrist, pers. comm. 2006).

Abundance

There is little information during the last 15 years to indicate if the global population is stable. Censuses of Siberian breeding grounds during the 1980s indicate that the population was about 50,000 individuals (Degtyaryev 1991), considerably higher than the estimate of 10,000 sexually mature birds in the 1970s (Borodin *et al.* 1978, cited in Macey 1981). In the late 1980s, the Ross's Gull population in Alaskan waters in September-October was estimated to be at least 20,000 (Divoky *et al.* 1988) and the eastern movement at Point Barrow in 1984 was estimated at a minimum of 15,000 (Alvo *et al.* 1996). The pelagic population at the pack ice edge in the Chukchi Sea in 1970 was estimated at between 20,700 and 38,000 (Divoky 1988). A maximum of 4,300 individuals was observed feeding in a flock at Point Barrow on 29 September 1976 (Kessel and Gibson 1978). The global population was considered stable based on accounts of birds migrating by Point Barrow, Alaska in the 1980s (Divoky *et al.* 1988, Alvo *et al.* 1996).

In Canada, the Ross's Gull occurs at low population numbers, scattered throughout the low and high Arctic region. The total known breeding population has ranged from 0 to 10 pairs per year. However, as A.J. Gaston (pers. comm. 2006) points out, "the species might actually number in the hundreds of breeders, given the huge areas of unexplored habitat available; on the other hand, we cannot possibly pretend to know anything about its current population trends on the basis of the very scattered localities where populations have been followed to any extent – really just Churchill. Given the potential breeding habitat in Canada and the apparently rather peripatetic nature of the species, I think it certain that there are quite a few more that we have not yet found."

Churchill, Manitoba

Sightings of Ross's Gulls have been reported more often and more continuously in the area around Churchill than other known sites in Canada (R. Koes, pers. comm. 2006). Since the initial sighting in 1978, a photographed adult that occurred between 18–23 June (Manitoba Avian Research Committee 2003), the species has been recorded almost annually, with nestings documented at the Akudlik site in the 1980s and further up the Churchill River in recent years (Alvo *et al.* 1996, Manitoba Avian Research Committee 2003, R. Koes, pers. comm. 2006, IBA Site MB 003). The Churchill population has ranged from one to five pairs since 1980; the maximum number of known nests was five in 1982.

Since the mid-1990s, the traditional breeding sites at Churchill appear to have been abandoned. There have been persistent reports of nesting pairs upstream from the end of the Hydro Road (R. Koes, pers. comm. 2006), and apparently there were five nests there in 2002. After the mid-1980s locations of nests have usually been kept secret (if any were found), therefore an incomplete picture of the status each year at Churchill has emerged. Only a single bird has been reported in some years, and up to four in others (R. Koes, pers. comm. 2006); for example, four were reported in 2005.

Other records in suitable habitat in northern Manitoba include two adults seen by J.D. Reynolds on June 10, 1984, at La Perouse Bay, flying inland from Hudson Bay (Alvo *et al.* 1996).

Specimens from the Churchill site are in the Canadian Museum of Nature (CMNAV 70983, 71120 and 71121, adults in July 1980 and 1981, and E4311 and E4781, eggs collected in 1981 and 1988; M. Gosselin, pers. comm. 2006). Two downy chicks were collected in 1982, and one in 1983, and are now in the Manitoba Museum collection (R. Koes, pers. comm. 2006).

Cheyne Islands, Nunavut

Three pairs nested on the island in 1976, and six pairs nested in 1978 with an additional eight unpaired birds also present, hence a maximum of 20 birds present (Macey 1981), and it is possible that they had nested here for several years (MacDonald 1978, Alvo *et al.* 1996). Although no nests were found at the Cheyne Islands in 1977 or in 1979, birds were seen there in 1974 and 1979 (Macey 1981). Further surveys did not find Ross's Gulls on the islands in 1986 (Alvo *et al.* 1996), nor between 2002 and 2005 (Mallory *et al.* 2006). However, in 2006, three pairs were found in locations where they had nested previously (G. Gilchrist, pers. comm. 2006).

Although all three islands were used for nesting, Ross's Gulls have not bred regularly in any one location within the islands. Ross's Gulls, apparently already paired, arrived in early June and nesting was usually completed by mid-July. Breeding attempts appeared to have been unsuccessful, although a juvenile bird was seen flying over Bathurst Island in 1979 (MacDonald 1978, Macey 1981, Alvo *et al.* 1996). The polynyas present on the eastern side of Penny Strait appeared to provide an important feeding area for the gulls (Canadian IBA Site Catalog 2006).

Unnamed Island in Penny Strait

A previously undiscovered small colony of four and possibly five breeding pairs was located on an unnamed island in Penny Strait in 2005 (Mallory *et al.* 2006), and one pair was found nesting there in 2006 (G. Gilchrist, pers. comm. 2006). This location is only 80 km from the nesting sites on the Cheyne Islands. The island was also surveyed in 2002 through 2004, with no birds being located. Mallory *et al.* (2006) note that colony occupation by Ross's Gulls in the Canadian High Arctic appears to be intermittent, and the birds may move nesting locations in response to predation or annual snow and ice conditions.

Prince Charles Island

Bechet *et al.* (2000) reported a breeding pair of Ross's Gulls at the northwest corner of Prince Charles Island on 8 July 1997, a locality only 200 km from the first collected specimen in 1823 on the east coast of the Melville Peninsula. No additional birds were found on Prince Charles or nearby islands during aerial and terrestrial

surveys in 1996 and 1997, and there is no information on occupancy by Ross's Gulls of Prince Charles Island in recent years.

Fluctuations and trends

The low numbers of Ross's Gulls that occur at any one site in Canada precludes analysis of fluctuations and population trends. The nesting occurrences in the High Arctic appear not to be consistent from year to year, presumably as a result of variables such as predation pressure or snow and ice conditions. The North American Waterfowl Conservation Plan (2002) lists the species as showing an apparent decline, although no details are given.

Rescue effect

The known breeding population of Ross's Gulls in Canada and Greenland represents less than 1% of the total global breeding population. The current status of the global Ross's Gull population is unknown; reports documenting global populations in the 1980s indicate that the world's population of Ross's Gulls was about 50,000 and had not changed significantly since the end of the 1800s (Alvo *et al.* 1996). Rescue from the Siberian population is clearly possible, although it is not known whether the population breeding in Canada is part of the total global breeding population, or if it constitutes a distinct breeding population separate from the major nesting areas in Siberia.

LIMITING FACTORS AND THREATS

Industrial activity

Oil development in the Beaufort and Chukchi Seas poses a potential threat (Burger and Gochfeld 1996, Alvo *et al.* 1996). The concentrations of birds during September and October as they head east into the Beaufort Sea, and then west into the Chukchi and Bering Seas makes the species particularly vulnerable to oil spills, either directly as oil accumulation on the bird itself or in impacting prey availability (Alvo *et al.* 1996). Breeding sites in Canada are relatively remote and are not at risk from industrial development at present, although there are significant oil and gas reserves in the Canadian Arctic that might be exploited at some future date.

Climate change

Given the rate at which climate change is affecting the Arctic, any obligate Arctic-adapted species should be considered under imminent threat (A.J. Gaston, pers. comm. 2006). Annual snow and ice patterns are probably major limiting factors influencing the decision to breed in any given year, since one critical variable is the presence of open water close to the nesting site. Weather events such as floods and periods of cold weather may also decrease reproduction substantially (Macey *et al.* 1981); in 1986, a

heavy rainstorm killed five of six hatched chicks in a population in Siberia (Densley 1988). Climate change, therefore, represents an unknown effect on the reproductive ecology of Ross's Gulls.

Human disturbance

Disturbance by humans is a potential threat to the Ross's Gull in Canada (Macey 1981). The discovery of Ross's Gulls at Churchill in 1978 has resulted in Churchill being among the most popular of Arctic and subarctic locations for bird-watchers and photographers to visit (Hamel 2002). At least one nest was abandoned because a photographer was too close (Alvo *et al.* 1996). However, Ross's Gulls are reported to nest successfully beside hunting camps in Russia (Alvo *et al.* 1996), whereas observers within 100 m from a nest are reported to disturb the gulls (Béchet *et al.* 2000).

In the Churchill area, there have been persistent reports of nests upstream from the end of the Hydro Road (R. Koes, pers. comm. 2006). Although more remote than the Akudlik site, the new sites are still vulnerable to disturbance from airboats and helicopters travelling south along the river. The remoteness of breeding sites in Nunavut offers some protection to nesting Ross's Gulls.

There likely still is a black market for the sale of Ross's Gull eggs; a Ross's Gull egg was apparently a valuable acquisition for oologists, with an estimated value of \$10,000 to \$20,000 on the black market in the early 1980s (Alvo *et al.* 1996). The theft of a nest and eggs in 1981 bears testament to the ongoing trafficking in bird's eggs (Alvo *et al.* 1996).

Habitat destruction

Of the four known nesting localities of Ross's Gulls in Canada, the three High Arctic sites are probably fairly immune to possible habitat alteration but the known sites at Churchill are potentially vulnerable. Reports that Manitoba Hydro flooded the Akudlik Marsh in 1984 (Alvo *et al.* 1996) appear to be groundless. Why the shift in nesting locations at Churchill occurred remains undetermined.

SPECIAL SIGNIFICANCE OF THE SPECIES

Before the 1980s, Ross's Gulls had a remarkable mystique among the bird-watching community for their rarity (Manitoba Avian Research Committee 2003, Berger 2005, ENature 2006). The discovery of nesting Ross's Gulls in Churchill resulted in a continuing economic boost for the community, as birders, naturalists and photographers flocked to the area and indeed still do (Macey 1981, Alvo *et al.* 1996, Newton *et al.* 2002, R. Koes, pers. comm. 2006).

ABORIGINAL TRADITIONAL KNOWLEDGE

Subsistence harvest of Ross's Gulls in Canada is probably negligible, although there are reports of the harvesting of birds at Point Barrow and migrant birds being shot for food by Alaskan Inuit (Macey 1981, Burger and Gochfeld 1996). In general, this species appears to play a minor role in the life of Inuit of Arctic Canada. Mallory *et al.* (2001) interviewed Inuit hunters in southern Baffin Island communities. These hunters were familiar with the Ross's Gull, which could be birds migrating from colonies in Foxe Basin. However, they noted that the bird was very uncommon.

EXISTING PROTECTION OR OTHER STATUS DESIGNATIONS

The species was designated "Special Concern" by COSEWIC in April 1981. Its status was examined and confirmed in April 1996, and then re-examined in November 2001 and designated "Threatened". Section 33 of the *Species at Risk Act* (SARA) prohibits damaging or destroying the residence of a listed threatened, endangered, or extirpated species. In addition to SARA, this species and its nest are protected under the *Migratory Birds Convention Act* of 1994. These regulations prohibit the hunting or collection of eggs, nests, and birds in Canada and the United States. Ross's Gulls are protected under the *Canada National Parks Act* where it occurs in Wapusk National Park, although the species is not known to nest there.

Ross's Gull is considered vulnerable/apparently secure (NatureServe 2005:G3G4 in Canada: Manitoba and the United States: Alaska) and not globally threatened (Burger and Gochfeld 1996). It is federally listed as Threatened on Schedule 1 of the *Species at Risk Act*, and is considered rare nationally (N2B) and critically imperiled in Manitoba (S1B) (NatureServe 2004). It is globally ranked as G3G4, vulnerable, and its national status in the United States is not assessed except in Alaska where it is classed as S3N, also vulnerable.

TECHNICAL SUMMARY

Rhodostethia rosea

Ross's Gull

Mouette rosée

Range of Occurrence in Canada: Nunavut Territory and Manitoba

Extent and Area Information	
<ul style="list-style-type: none"> Extent of occurrence (EO)(km²) Calculated by including areas of all breeding locations, including historical ones (e.g. Cheyne Islands) 	300,000 km ²
<ul style="list-style-type: none"> Specify trend in EO 	Unknown
<ul style="list-style-type: none"> Are there extreme fluctuations in EO? 	No
<ul style="list-style-type: none"> Area of occupancy (AO) (km²) Calculated by selecting the four known breeding locations and using a 50km radius around each location 	31,000 km ²
<ul style="list-style-type: none"> Specify trend in AO 	Unknown
<ul style="list-style-type: none"> Are there extreme fluctuations in AO? 	No
<ul style="list-style-type: none"> Number of known or inferred current locations 	3 known in 2005/06: Churchill, Penny Strait, Cheyne Islands
<ul style="list-style-type: none"> Specify trend in # 	Unknown
<ul style="list-style-type: none"> Are there extreme fluctuations in number of locations? 	No
<ul style="list-style-type: none"> Specify trend in area, extent or quality of habitat 	Stable
Population Information	
<ul style="list-style-type: none"> Generation time (average age of parents in the population) 	>10 years
<ul style="list-style-type: none"> Number of mature individuals 	Up to 20 observed, likely more
<ul style="list-style-type: none"> Total population trend: 	Unknown, but likely stable
<ul style="list-style-type: none"> % decline over the last/next 10 years or 3 generations. 	Unknown
<ul style="list-style-type: none"> Are there extreme fluctuations in number of mature individuals? 	No
<ul style="list-style-type: none"> Is the total population severely fragmented? 	Based on known groups, yes
<ul style="list-style-type: none"> Specify trend in number of populations 	Stable
<ul style="list-style-type: none"> Are there extreme fluctuations in number of populations? 	No
<ul style="list-style-type: none"> List populations with number of mature individuals in each: 1. Churchill – 4 (2005); 2: Penny Strait – 10 (2005); 3: Cheyne Islands – 6 (2006); 4: Prince Charles Island - ? 	
Threats (actual or imminent threats to populations or habitats)	
Industrial development Human disturbance Climate change	
Rescue Effect (immigration from an outside source)	
<ul style="list-style-type: none"> Status of outside population(s)? Major breeding population in Siberia; unknown trend, but possibly stable 	
<ul style="list-style-type: none"> Is immigration known or possible? 	Yes
<ul style="list-style-type: none"> Would immigrants be adapted to survive in Canada? 	Yes
<ul style="list-style-type: none"> Is there sufficient habitat for immigrants in Canada? 	Yes
<ul style="list-style-type: none"> Is rescue from outside populations likely? 	Yes
Current Status	
COSEWIC: Threatened (2001, 2007)	

Status and Reason for Designation

Status: Threatened	Alpha-numeric code: Met criterion for Endangered, D1, but designated Threatened, D1, because there is potential for rescue and because more birds likely occur in unsurveyed areas.
Reason for Designation: In Canada, this species is known to occur in small numbers in very few locations. Threats include disturbance in some breeding areas and changes in ice and snow patterns associated with climate change.	
Applicability of Criteria Criterion A: (Declining Total Population): Does not meet criterion. Criterion B: (Small Distribution, and Decline or Fluctuation): Does not meet criterion. Criterion C: (Small Total Population Size and Decline): Does not meet criterion. Criterion D: (Very Small Population or Restricted Distribution): Meets D1 Endangered because known population < 250 mature individuals. Criterion E: (Quantitative Analysis): No quantitative analyses.	

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