

# Inuvialuit ecological knowledge of King Eiders, Pacific Common Eiders, Black Brant, and some other birds near Holman and Sachs Harbour, Northwest Territories

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## Abstract

In 1992–1993, interviews of Inuvialuit hunters from Holman on Victoria Island and Sachs Harbour on Banks Island, Northwest Territories, were used to document local knowledge of King Eiders *Somateria spectabilis*, the Pacific race of Common Eider *Somateria mollissima v-nigra*, Black Brant *Branta bernicla nigricans*, Lesser Snow Geese *Anser caerulescens caerulescens*, and some other common species of birds. Interview topics included spring migration, nesting, moulting, brood rearing, fall migration, subsistence hunting, and general ecology. Much of the information provided by hunters was geographic in nature and is best represented on maps. From a waterfowl management perspective, information gathered on (1) the migration paths and nesting areas used by eiders near Holman and (2) the areas used by nesting Black Brant and migrating Lesser Snow Geese near Sachs Harbour is especially useful.

## 1. Introduction

Waterfowl are of great socioeconomic importance to the Inuvialuit of the Western Canadian Arctic. To guarantee the successful long-term management and conservation of waterfowl in the Inuvialuit Settlement Region, a better understanding of the basic biology of a number of species is required. In particular, better information on the habitat, distribution, and abundance of King Eiders *Somateria spectabilis*, the Pacific race of Common Eider *Somateria mollissima v-nigra* (referred to as Common Eiders or Pacific Common Eiders), and Black Brant *Branta bernicla nigricans* is necessary.

In northern Canada, an effective method of obtaining qualitative information on many species of wildlife is through discussions with Aboriginal hunters. Because of their need to harvest animals for food, the Inuvialuit and other native hunters can be expected to possess a good knowledge of the habitat, seasonal distribution, and abundance of many game animals. Migration routes, breeding areas, staging and moulting sites, behaviour, and body condition are all important considerations for subsistence hunters. The perceptions of native hunters concerning the abundance and distribution of harvested species can provide useful information that might not otherwise be available to wildlife managers.

In 1992 and 1993, the Canadian Wildlife Service interviewed Inuvialuit hunters residing at Holman on Victoria Island and at Sachs Harbour on Banks Island, Northwest Territories (Fig. 1). At that time, relatively few waterfowl surveys had been carried out on these mid-Arctic islands. The objectives of the interviews were to document local knowledge of the distribution, abundance, and ecology of King Eiders, Common Eiders, Black Brant, and other common species of waterfowl. We also recorded information on other species of migratory birds reported here, along with the findings on the focus species.

## 2. Study area

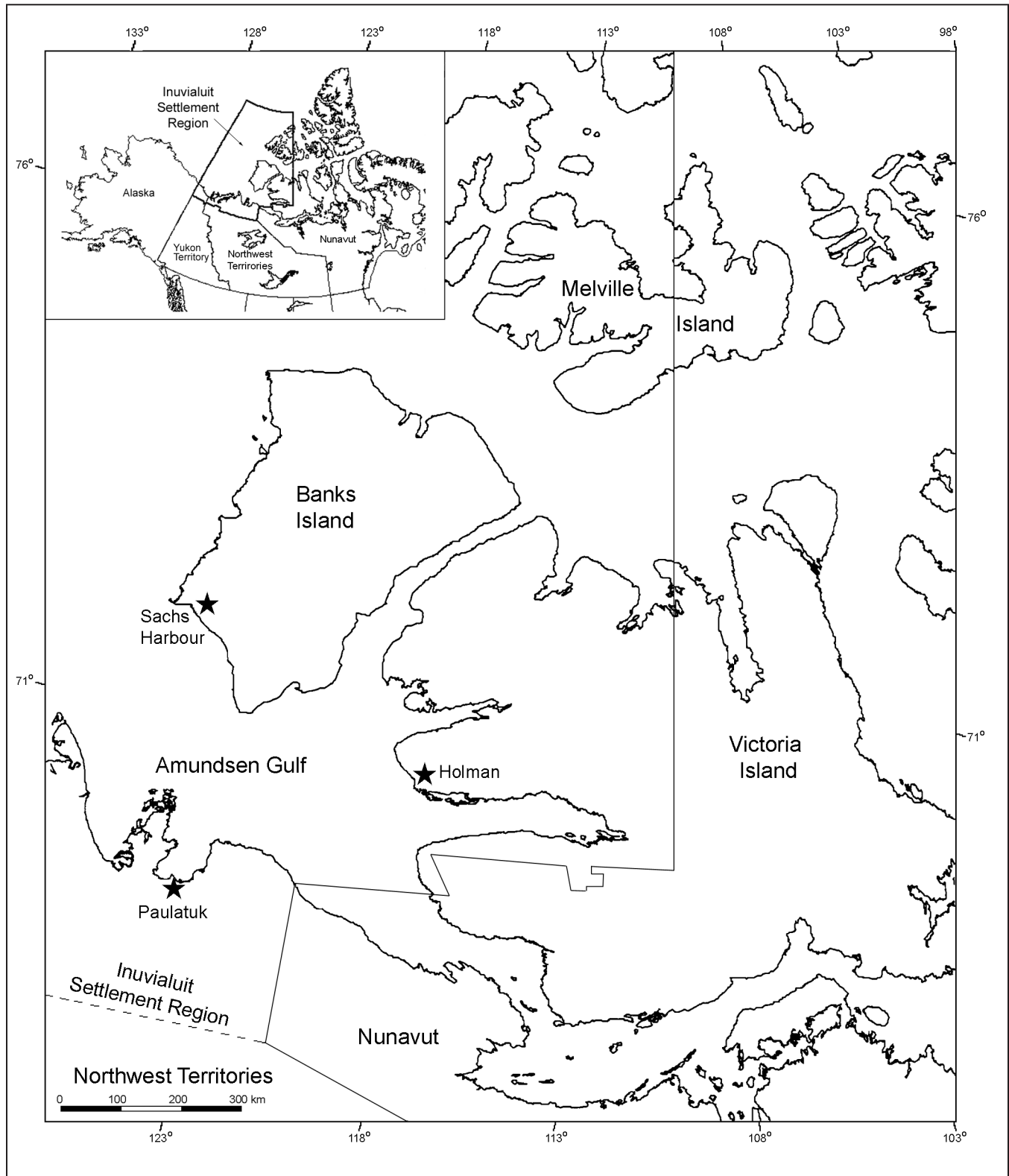
Interviews of Inuvialuit hunters were conducted at Holman (70°44'N, 117°45'W) (population 345) and Sachs Harbour (71°59'N, 125°10'W) (population 161), Northwest Territories, in 1992 and 1993 (Fig. 1). Residents of both settlements rely heavily on subsistence harvest of wildlife.

### 2.1 Sachs Harbour

Sachs Harbour is located on Banks Island, the most westerly island of the Canadian Arctic Archipelago (Fig. 1). Banks Island has a “polar desert” climate, with short, cool summers and long, dry winters (Steere and Scotter 1979). The annual mean daily air temperature at Sachs Harbour is –13.3°C. Mean daily temperatures during June, July, and August are 2.9, 6.8, and 3.5°C, respectively. Mean annual precipitation is 149.4 mm, and the mean annual snowfall is 105.4 cm (Environment Canada 2003). Leads (linear openings in the sea ice) typically form in late April, and watercourses begin to thaw by June. Freeze-up begins in mid-September, and streams are completely frozen by early November (Canadian Wildlife Service 1992).

Sachs Harbour is situated on a coastal lowland plain that covers central and western Banks Island (Steere and Scotter 1979). This plain is drained by a number of westward-flowing rivers, which originate in the uplands of eastern Banks Island. Broad, well-vegetated deltas have developed where these rivers enter the Beaufort Sea. A morainal belt along eastern Banks Island has created a gently rolling to rough topography east of Sachs Harbour. This moraine forms the principal drainage divide on Banks Island.

**Figure 1**  
Location of Sachs Harbour and Holman in the Inuvialuit Settlement Region of the Northwest Territories



A high plateau (Nelson Head) is the dominant landform at the southern end of Banks Island (Steere and Scotter 1979).

Approximately 20% of Banks Island is covered by grassland and marsh, 50% is well vegetated, and 30% consists of barren or near-barren uplands and hillsides (Manning et al. 1956). Low-lying, level areas of the coastal plain support extensive grass and sedge cover. Plant cover diminishes upslope, and hilltops support mainly sparse clumps of dwarf shrubs, cushion plants, and lichens (Canadian Wildlife Service 1992). The high plateau southeast of Sachs Harbour and the southeastern part of the island from De Salis Bay to Jesse Harbour are sparsely vegetated. In the latter areas, sedge- and grass-dominated meadows occur mainly near streams and ponds (Steere and Scotter 1979).

## 2.2 Holman

Western Victoria Island is in the same climate region as Banks Island (Maxwell 1980). The mean annual temperature at Holman is  $-11.7^{\circ}\text{C}$ , and only June, July, August, and September have mean daily temperatures above zero (4.2, 9.2, 6.6, and  $0.5^{\circ}\text{C}$ , respectively) (Environment Canada 2003). The total annual precipitation at Holman averages 162.4 mm, slightly over half of which occurs as snowfall (Environment Canada 2003).

The relief of western Victoria Island is gently rolling to hilly, and the landscape is dotted with numerous lakes (Allen 1982). Thick morainal deposits border the northwestern part of Prince Albert Sound and also occur on the southern portion of Diamond Jenness Peninsula. The rugged terrain of these areas consists of ridge-like and irregular-shaped hills. The Minto Inlet/Kuujjua River region has numerous cliffs and rock outcrops. The Shaler Mountains, a band of rugged ridges, high plateaux, steep escarpments, linear valleys, and summits rising to 500 m high, extend northeast from Holman, past the Kuujjua River to Hadley Bay (Thorsteinsson and Tozer 1962). The Kagloryuak River lowlands extend 100 km inland from the head of Prince Albert Sound.

Two dominant plant communities occur on western Victoria Island: dwarf shrub–sedge tundra on drier uplands and grass–sedge communities in lowland areas. Cover varies from continuous in some lowland areas to very sparse on drier uplands. Areas with more continuous vegetation include the Kagloryuak River lowlands, the area bordering the eastern half of Prince Albert Sound, and the small lowland at the head of Minto Inlet (Allen 1982).

## 3. Methods

Interviews were conducted following the “semi-directive” approach, with limited intervention by the interviewer. Nakashima and Murray (1988) considered this method to reduce interviewer bias, because it allowed hunters to discuss what they thought was important and of interest. All interviews were conducted by David Kay with the help of a local interpreter/assistant (David Kuptana in Holman and Geddes Wolkie, Sr. in Sachs Harbour). Interviews were recorded on audio tape, and the English dialogue between translator and interviewer was transcribed verbatim.

Geographic information was recorded on acetate overlays of 1:250 000 topographic maps. A new sheet of acetate was used for each interview, so that the results of one interview did not affect the results of another. Data from all interviews were transferred onto a master 1:250 000 map.

Subsistence hunters (i.e., holders of Northwest Territories General Hunting Licences) at Sachs Harbour and Holman comprised a significant proportion of the population. Time constraints precluded the interviewing of all hunters, so a “short” list of potential interviewees was established using two main criteria: age and experience of the hunters. Older and more experienced hunters were chosen in order to obtain information on possible long-term changes in species population size and distribution. The list was further reduced after discussions with the two assistants to select interviewees who were most knowledgeable about wildlife in the region. In Holman, 43 individuals, ranging in age from 30 to 79 years, were interviewed. In Sachs Harbour, 14 people, ranging in age from 35 to 73 years, were interviewed.

Interview length ranged from less than one hour to more than three hours, depending on characteristics of the interviewees, such as knowledge, experience, and personality (e.g., how talkative they were). Information was acquired primarily on seven species/subspecies: Pacific Common Eiders, King Eiders, Black Brant, Canada Geese *Branta canadensis*, Lesser Snow Geese *Anser caerulescens caerulescens*, Tundra Swans *Cygnus columbianus*, and Sandhill Cranes *Grus canadensis*.

For each species, information was gathered on the following topics: (1) spring migration (chronology, routes, habitat use); (2) nesting (nest site selection, timing, duration, hatching, abundance); (3) moulting and brood rearing (location, habitat selection, chronology); (4) fall migration (chronology, patterns, habitat use); (5) subsistence hunting (location, timing); and (6) general ecology (species abundance, population changes, causes of mortality).

## 4. Results: Holman region

### 4.1 Spring migration

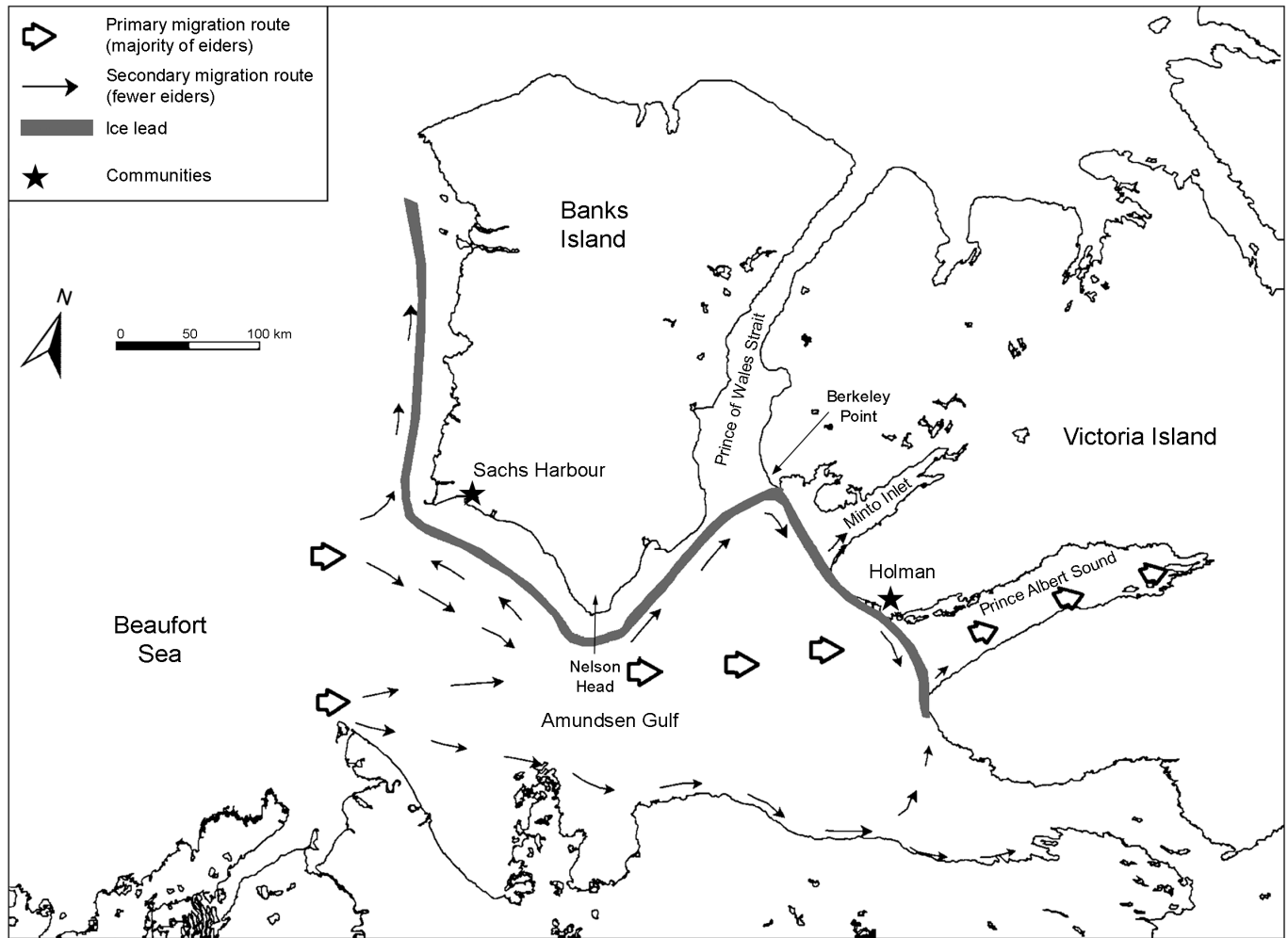
#### 4.1.1 Sandhill Cranes, Canada Geese, and Tundra Swans

The first birds observed in the Holman region are Sandhill Cranes, Canada Geese, and Tundra Swans. These species arrive in early May when bare ground first appears. Their observed migration route is from the south. Local residents indicated that these species cross to Victoria Island from the mainland near Dolphin and Union Strait and fly past Holman en route to nesting areas.

#### 4.1.2 Pacific Common Eiders

A large shore lead forms from Ramsay Island south along the coast to Holman Island and across the mouth of Prince Albert Sound by the end of May (Figs. 2 and 3). Other openings form where tidal currents occur near the islands in Safety Channel (Fig. 4). Pacific Common Eiders are the first waterfowl to use these staging/feeding areas, arriving in late

**Figure 2**  
Open water leads and migration route of eiders in the Beaufort Sea/Amundsen Gulf region



May in small flocks composed of pairs. Courtship behaviour is exhibited by these early arrivals, and mating attempts are frequently observed. Pacific Common Eiders are reported to feed on molluscs and echinoderms at the main coastal shore lead. Shells and exoskeletons are sometimes seen along the ice adjacent to open water leads where eiders have been feeding.

#### 4.1.3 King Eiders

The first King Eiders arrive in the Holman area in early June. Observations made by people who camp at Berkeley Point, Minto Inlet, and Cape Ptarmigan suggested that the main flight path originates from the direction of Nelson Head on Banks Island, with smaller numbers of eiders coming south from Prince of Wales Strait/Berkeley Point (Figs. 2 and 3).

Hunters described the spring migration as occurring in “three waves.” The first wave consists of small groups of 5–10 pairs, which mix with Pacific Common Eiders already present in open water areas (Fig. 4). Feeding and courtship behaviours are exhibited by these early arrivals. A second wave arrives in mid-June in groups of 15–30 pairs. These migrants stage at open water leads and other areas that are

kept free of ice by tidal currents. Pacific Common Eiders begin to nest at colonies in Prince Albert Sound, Minto Inlet, Berkeley Point, and Ramsay Island about this time (Fig. 5).

The third or “main bunch” of King Eiders arrives at Masoyuk, the traditional eider hunting “pass,” around the third week in June (Figs. 3 and 4). These migrants do not stage in open water, and continuous flights of paired King Eiders are observed. Few Pacific Common Eiders are present in the final wave of migrating eiders.

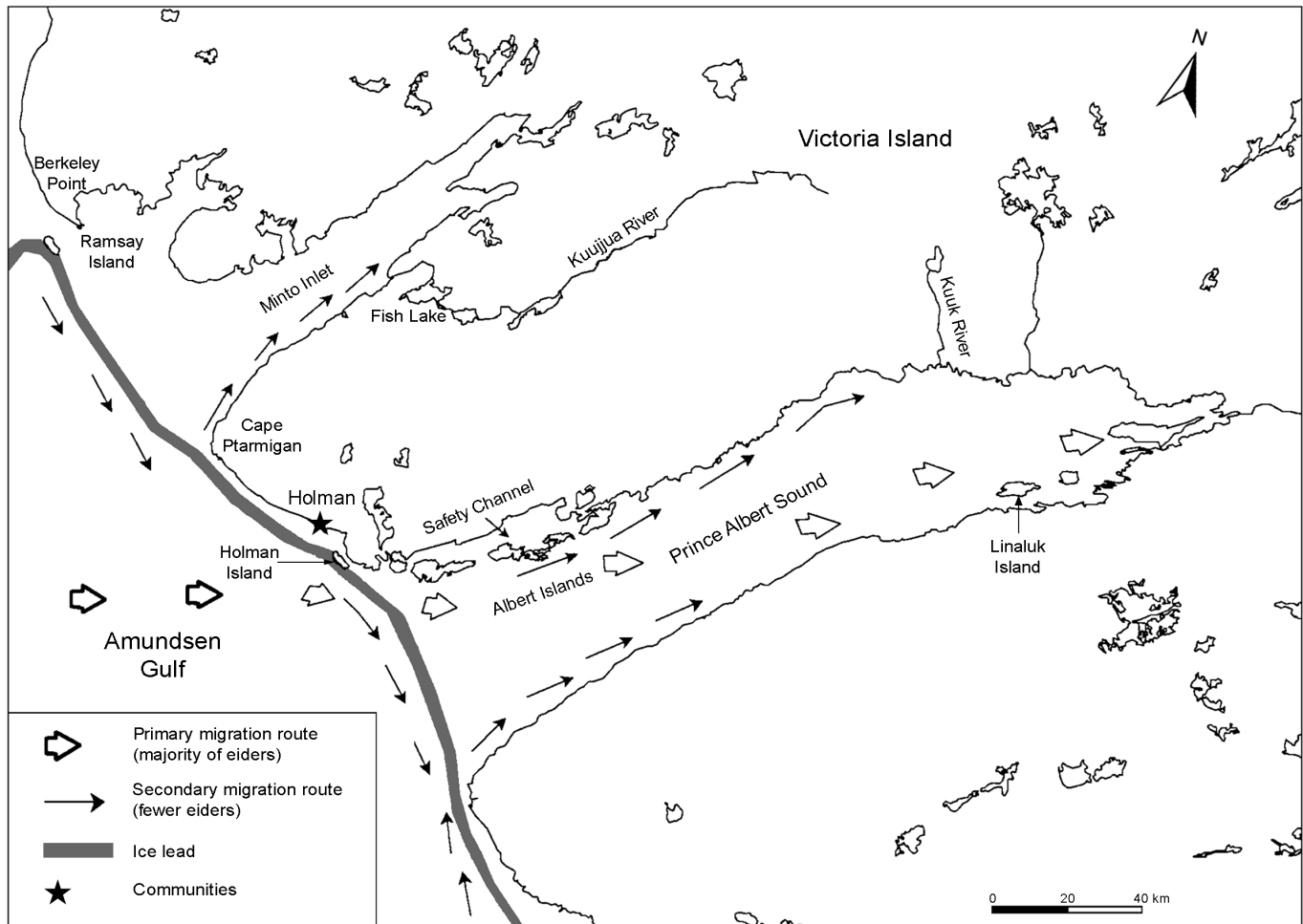
The main shore lead near Holman funnels King Eiders south through Masoyuk. Most eiders then fly eastward past the islands in the Safety Channel, across Prince Albert Sound, and along the southern coast of the sound towards the mouth of the Kagloryuak River (Figs. 3 and 4). The migration period lasts about one week and is finished by the end of June.

People who have camped near Minto Inlet in spring report having seen very few migrating King Eiders and that Pacific Common Eiders, in relatively small numbers, are the main migrants. Some Holman residents formerly camped and hunted at the east end of Prince Albert Sound along the northern shore of Linaluk Island. Similar numbers of eiders are said to pass through this area as at Masoyuk (Fig. 3).

As the “third wave” of eider migration is finishing, small flocks of male King Eiders begin to arrive in the



**Figure 3**  
Open water leads and migration route of eiders in the Holman region



Holman region from breeding areas farther east, suggesting that early nesting females are well into egg laying and that the pair bonds have broken (Lamothe 1973). These emigrant males follow the same route as immigrating flocks but pass through the Holman area without stopping to rest or feed. Their numbers increase into the first week of July, and the return migration past Holman is completed by mid-July. Most hunters believe that these migrants return to their distant moulting and wintering grounds, and no hunters reported seeing moulting King Eider males.

Based on the relative amounts of intra-abdominal and subcutaneous fat present in birds harvested at Masoyuk, female King Eiders are said to be in better body condition than males. Eggs with shells are frequently found in the reproductive tracts of harvested females, indicating the advanced breeding condition of these females. Less effort is made by hunters to hunt flocks of emigrant males, apparently because these birds are not very fat. Small numbers of emigrant male King Eiders are harvested (as are Pacific Common Eider males) for preparation as dry meat.

No subadult males are believed to be present at Holman during spring migration, and only drakes in full adult plumage are present. This observation concurs with that reported by T.W. Barry (in Palmer 1976), who suggested that very few subadult males enter the Beaufort Sea. Yearling females are thought to be present at Holman, however, and

hunters believe that they can be distinguished from adults (which are said to have lighter plumage).

#### 4.1.4 Black Brant

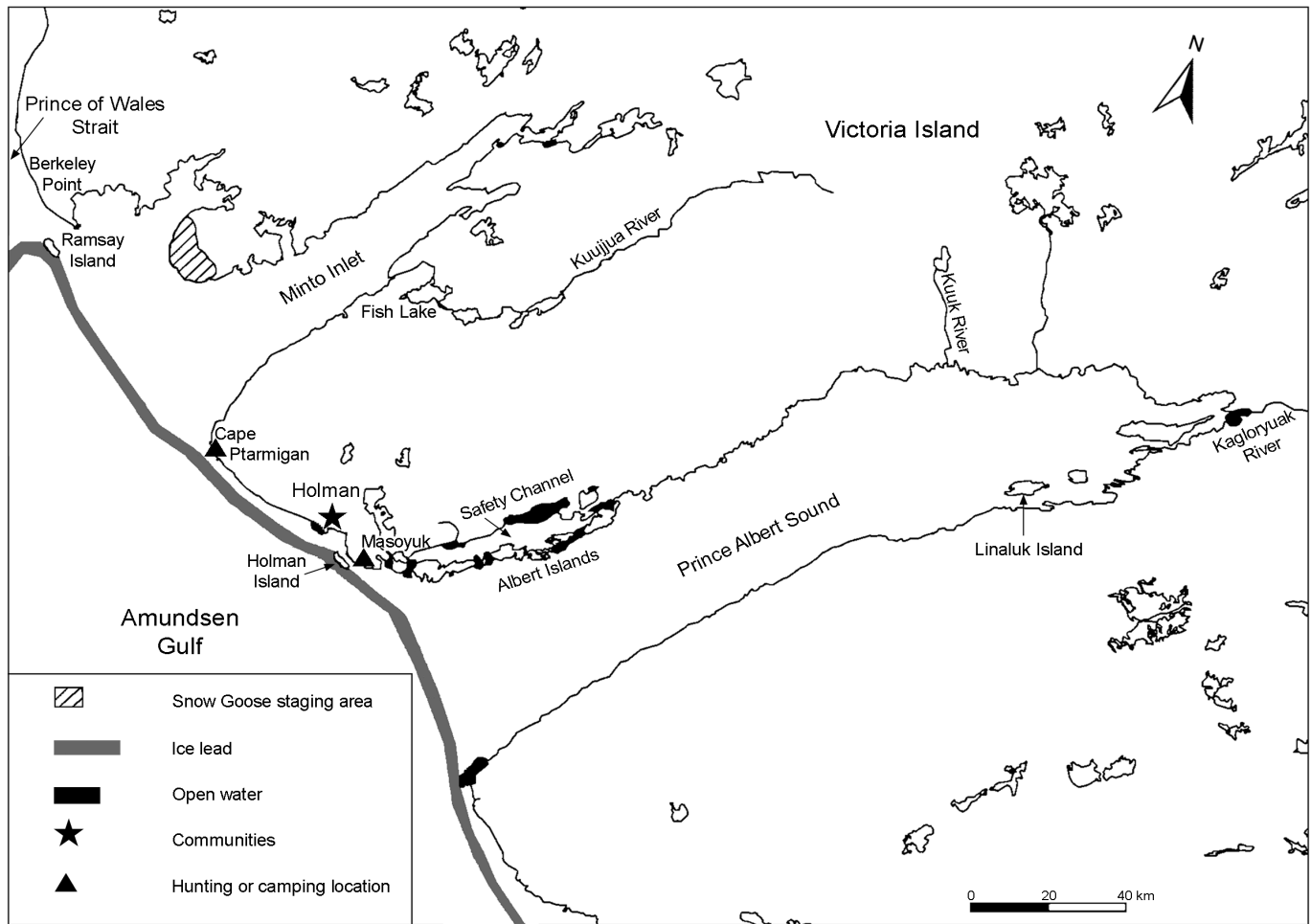
Black Brant arrive near Holman in mid- to late June, slightly before the main eider migration. Black Brant follow the same migration route as King Eiders and therefore are thought to originate from the same staging areas as well. Relatively few Brant come through the Holman area, and Brant are sparsely represented in local harvest surveys.

## 4.2 Nesting

### 4.2.1 Sandhill Cranes, Canada Geese, and Tundra Swans

Sandhill Cranes, Canada Geese, and Tundra Swans are the earliest species observed nesting in the Holman area, and all seem to have similar nesting chronologies. Egg laying is initiated shortly after arrival in early or mid-May. These species are described as being common throughout the area near Fish Lake Road (a travel route frequently used by Holman residents) and nest at low densities around inland lakes and ponds (Fig. 5). Some other areas were described as having higher densities of nesting Canada Geese. Several

**Figure 4**  
Important hunting areas and open water staging areas for waterfowl in the Holman region



islands in Fish Lake (near the mouth of the Kuujjua River) were reported as having “lots” of nesting Canada Geese, although numbers could not be quantified (Fig. 5).

The coast and uplands to the northwest of Holman, as well as the northern coast of Prince Albert Sound (between Halahivik and the east end of Safety Channel), were stated by many people as being a “good” place for Canada Geese (Fig. 5). These people were familiar with the typical densities along the Fish Lake Road, and so this area should be considered as having relatively higher densities of nesting geese.

At the east end of Safety Channel are high cliffs that support a colony of both gulls (probably Thayer’s Gulls *Larus thayeri*) and small Canada Geese (Fig. 5). It was not possible to quantify the number of goose nests present there from the interviews.

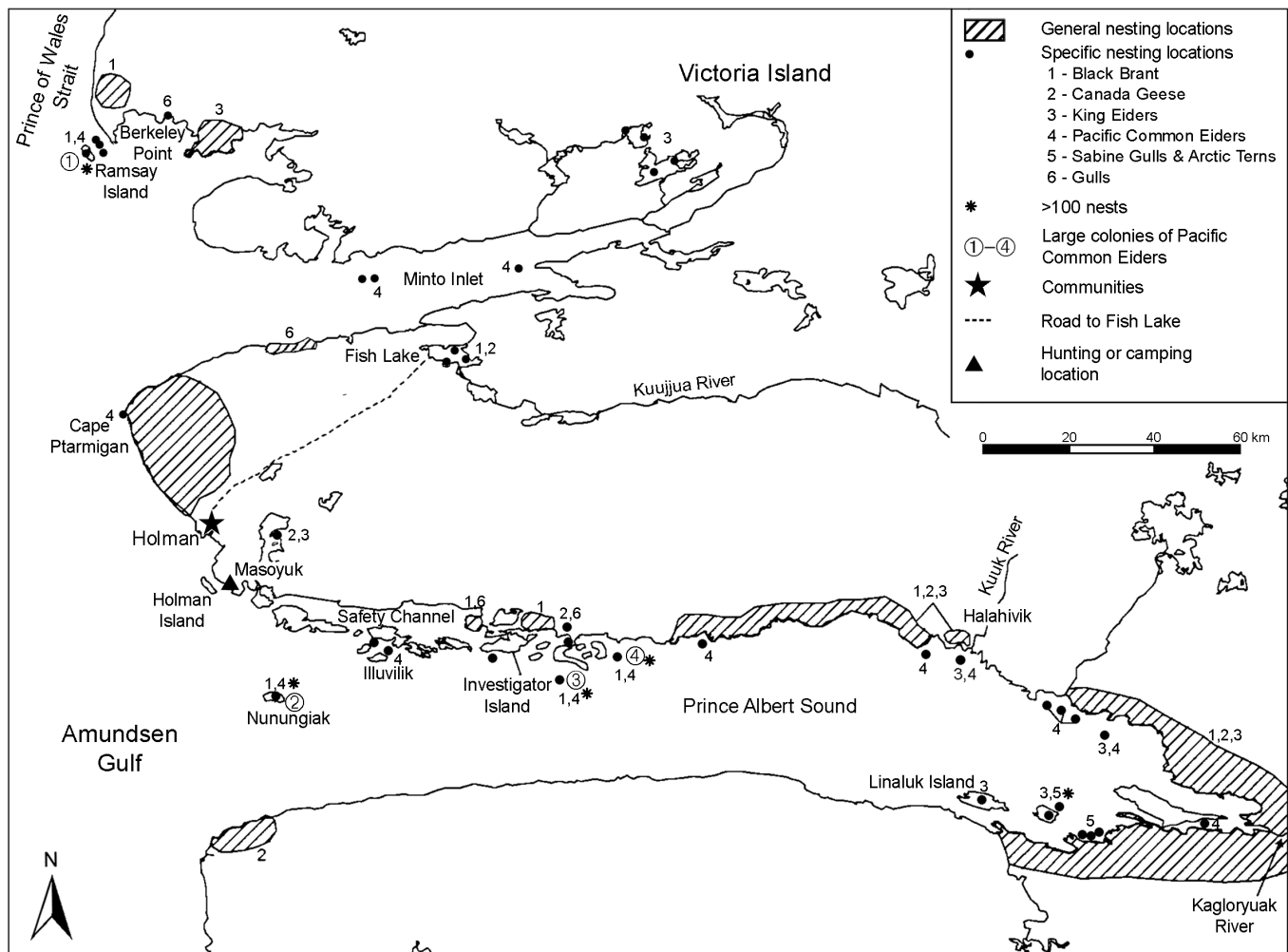
The most consistently noted area used by Canada Geese was the coast and lowlands at the head of Prince Albert Sound. An extensive area of several hundred square kilometres, stretching from the Kuuk River on the north coast down through the Kagloryuak River and along the south coast as far west as Linaluk Island, was identified as an important region for Canada Geese (Fig. 5), having the highest density of nesting Canada Geese of all areas mentioned.

#### 4.2.2 Pacific Common Eiders

Pacific Common Eiders were observed to initiate nesting earlier than either King Eiders or Black Brant. Typical nesting dates for this species are from mid- to late June. Initiation may be delayed into July in late springs. Around the third week in June, groups of male Pacific Common Eiders are observed, suggesting that incubation has begun at nesting colonies (Abraham and Finney 1986). Twenty-two nesting colonies were identified by Holman hunters, all on offshore islands in Prince Albert Sound, in Minto Inlet, or near Ramsay Island (Fig. 5). The abundance of nesting eiders is fairly uniform from site to site, with most having 10–50 nests. Four sites were described as having “hundreds” of nests: colony 1 — Ramsay Island off Berkeley Point; colony 2 — Nunungiak (Horizon Islets) at the mouth of Prince Albert Sound and including two nearby unnamed islets in Prince Albert Sound; colony 3 — to the southeast of Investigator Island; and colony 4 — to the east of the Safety Channel archipelago (Fig. 5). All of the larger colonies had nesting Black Brant and Glaucous Gulls *Larus hyperboreus* as well as eiders. Colony 4 was described as having close to 100 Brant nests.

Pacific Common Eider pairs are observed throughout laying and into the first part of incubation. Pairs favour gravelly areas for nesting, the next most preferred areas

**Figure 5**  
Important nesting areas for waterfowl in the Holman region



being those with plant cover. Pairs occasionally nest on solid rock and use mosses and sedges to line the nest. Old nest sites are reused, and some hunters believe that females return to the same nest they used in the previous year. Incubated clutches typically contain four eggs, although six- and seven-egg clutches were reported. Several people reported seeing both males and females incubating. This phenomenon was also reported by Inuit in Northern Quebec (Nakashima and Murray 1988).

Males tend to leave nesting females when the eggs are being incubated. Unlike King Eiders, male Pacific Common Eiders do not leave the breeding grounds immediately, and many males gather in protected bays and around islands to moult. Important moulting areas for male Pacific Common Eiders are the Safety Channel Islands in Prince Albert Sound and the coastal waters east of Berkeley Point (Fig. 6).

Small numbers of bird eggs are harvested by local people, but eggging is not widespread. Gull eggs are preferred over those of eiders and other species. Apparently, the amount of eggging is limited by ice conditions at peak nesting time, which restricts human access to nesting islands.

Hatching of Pacific Common Eider clutches peaks in mid- to late July, and large crèches of ducklings and females are seen around nesting islands about this time. Brood rearing occurs quite close to nesting islands (Fig. 6),

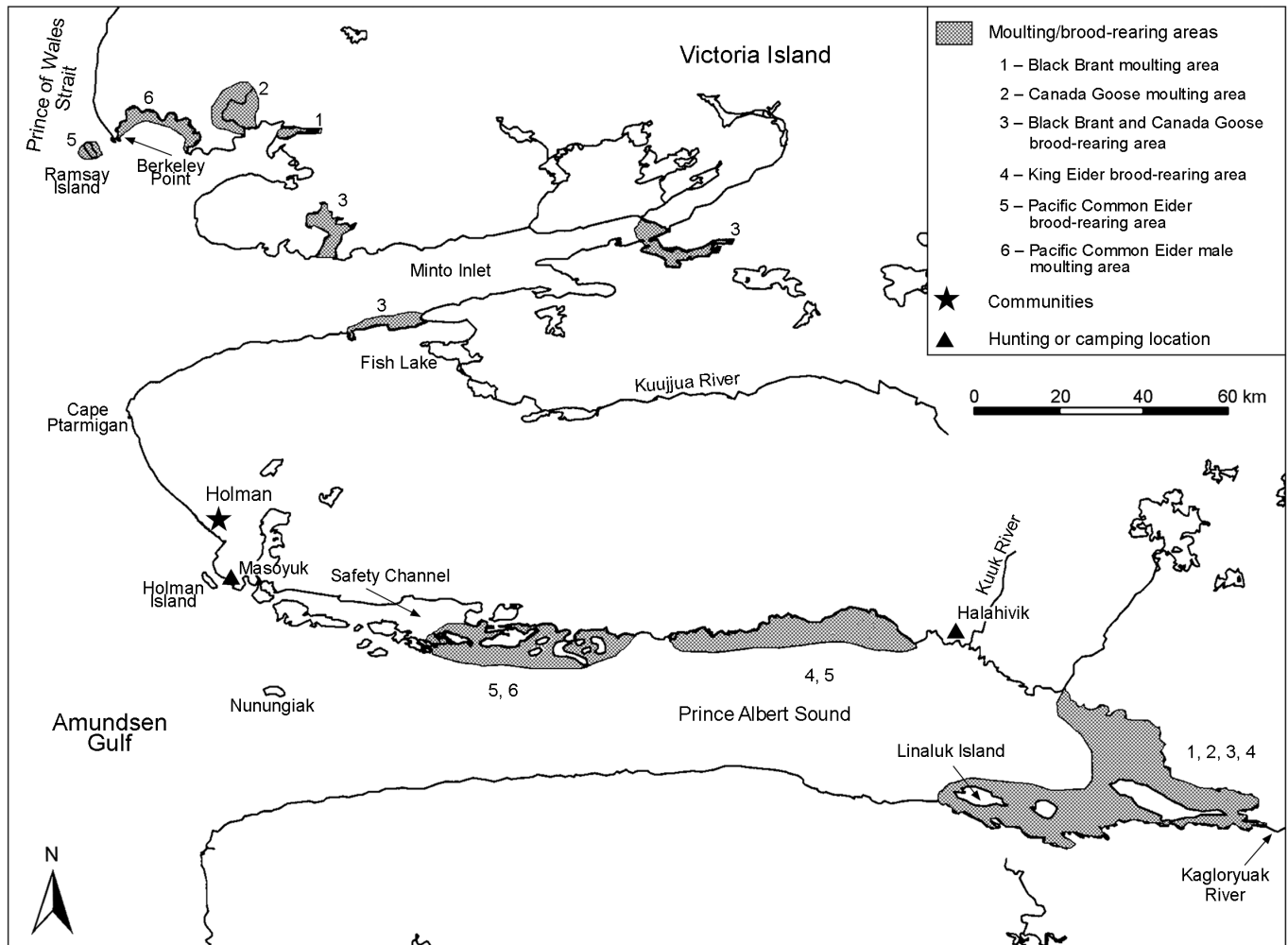
and most people believe a main criterion influencing nest site selection is proximity to good feeding areas for ducklings. Crèche size in Prince Albert Sound is typically 3–10 females plus 20–50 ducklings. Crèches in the Ramsay Island area are generally larger, with hundreds of ducklings forming large rafts along the coasts. The fledging date for Pacific Common Eiders is usually early to mid-September.

#### 4.2.3 King Eiders

King Eiders nest at low densities near ponds and lakes throughout the Holman area. Concentrations occur east of Berkeley Point, at a large lake complex north of Minto Inlet, and at Uyuoktok Lake (east of Holman). Other nesting areas occur along the coast of Prince Albert Sound from Safety Channel to Halahivik and from the Kuuk River through the Kagloryuak River valley and west to Linaluk Island (Fig. 5). One island colony, south of Investigator Island, is reported to have 20–50 females nesting beneath shelves of rock. At the east end of Prince Albert Sound, two islands were identified as having both King and Pacific Common eiders (Fig. 5).

The Linaluk Island area on the southeastern coast of Prince Albert Sound is reported to have two colonies of King Eiders (Fig. 5). One, on a small island northeast of Linaluk, is reported to contain large numbers of King Eiders as well

**Figure 6**  
Important brood-rearing and moulting areas for waterfowl in the Holman region



as Sabine's Gulls *Xema sabini* and Arctic Terns *Sterna paradisaea*.

Nest initiation for King Eiders occurs at the end of June and continues into the first part of July. Males leave nesting females shortly after laying begins and congregate in large groups, which leave for unknown moulting areas west of Holman. Nests are situated on islands in inland lakes and around pond margins. Occasionally, nests have been found in upland areas some distance from water.

Hatching occurs in late July to early August, and females with young move to coastal areas for brood rearing. Broods hatching at inland areas near the east end of Prince Albert Sound move to rivers and then downstream to the coast. The east end of Prince Albert Sound is by far the most important brood-rearing area for King Eiders (Fig. 6). Crèches of 20–50 ducklings with attendant females can be seen at protected bays and islands there. Female King Eiders are thought to stay with broods until fledging, and no female moult migration is known to occur.

Flying young are first seen in mid- to late August. Flocks of young and female King Eiders start to move through the Holman area by early September.

#### 4.2.4 Black Brant

Black Brant begin nesting in mid-June. Colonies of Brant occur at Berkeley Point, the islands in Fish Lake, the northeastern coast of Safety Channel, and some Pacific Common Eider colonies. Black Brant also nest in low densities along the coast northwest of Holman and along the northern and eastern coasts of Prince Albert Sound (Fig. 5). Most hunters agree that Brant are much more numerous at the head of Prince Albert Sound than near Holman and attribute this to the presence of Sabine's Gulls and Arctic Terns that nest there. Brant tend to nest in association with these and other avian species that aggressively defend the area around their nests against potential egg predators (Cotter and Hines 2001). Hatching occurs in early to mid-July, and large numbers of moulting Brant and young can be seen near the eastern end of Prince Albert Sound. Knowledge of fledging and fall movements is limited, as Black Brant are infrequently seen near Holman in the late summer and fall.