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STATUS OF THE NESTING POPULATION OF COMMON EIDERS SOMATERIA  
MOLLISSIMA BOREALIS IN THE CAPE DORSET BIRD SANCTUARY,  
NORTHWEST TERRITORIES, JULY 1991

Jacques Sirois  
David G. Kay

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## ABSTRACT

Following suggestions that the Cape Dorset Bird Sanctuary should be abolished, we visited this Sanctuary on 18-24 July 1991. Our objectives were to determine the number of active nests of Common Eiders and to record all species of birds and mammals in and near the Sanctuary. We estimated that there were approximately 800 active nests of eiders on 23 islands and islets. This represents a substantial decline since the Sanctuary was established in 1958. This decline was apparently fuelled by hunting and eggging; two activities that will likely continue in the future.

The Sanctuary was originally established to facilitate the development of a commercial eiderdown industry, an objective that was never met. Also, unlike many other sites in the eastern Arctic, less than 1% of the national breeding population of northern Common Eiders Somateria mollissima borealis breed in the Sanctuary. Thus, we recommend that it be abolished.

As suggested by this survey and other surveys along the north coast of Hudson Strait, large numbers of eiders and Black Guillemots Cephus grylle likely breed among the myriad islands that occur along this coast. This should be assessed further by collecting information from local hunters and subsequently carrying out boat surveys.

## RÉSUMÉ

Par suite de certaines propositions en faveur de l'abolition du Refuge d'oiseaux de Cape Dorset, nous avons dénombré les nids actifs d'Eiders à duvet dans ce refuge entre les 18 et 24 juillet 1991. Nous avons aussi noté tous les oiseaux et les mammifères présents dans le refuge ou à proximité. Nous avons estimé qu'il y avait environ 800 nids d'eiders dans 23 îles et îlots, ce qui constitue un déclin important depuis la création du refuge en 1958. Il semble que ce déclin ait été causé par la chasse et la collecte des oeufs, deux activités qui ne seront vraisemblablement pas discontinuées dans le futur.

Le refuge de Cape Dorset fut établi pour favoriser le développement d'une industrie de production de duvet. Cet objectif n'a jamais été atteint. De plus, contrairement à plusieurs autres sites de l'Arctique de l'est, moins de 1% de la population nationale d'Eiders à duvet Somateria mollissima borealis niche dans le refuge. Par conséquent, nous recommandons que le refuge soit aboli.

Comme le suggèrent cet inventaire et des inventaires précédents le long de la côte nord du détroit d'Hudson, il est possible que d'importantes colonies d'eiders et de Guillemots à miroir Cephus grylle nichent parmi les milliers d'îles au large de cette côte. Cela mérite d'être évalué d'abord à l'aide d'une enquête auprès des chasseurs de Cape Dorset et Lake Harbour et ensuite par un inventaire mené par bateau.

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## ACKNOWLEDGEMENTS

We are indebted to P. Ottokie, who was our guide and skipper during the survey. We thank K. Robertson, Department of Renewable Resources, GNWT, Iqaluit, for his logistic and financial assistance. J. Ottokie and Q. Aningmiuq helped us search eider nests. F. G. Cooch, R.S. Ferguson and K.J. McCormick reviewed this report and provided useful comments. Autumn Downey drafted the figures. J. Hunt translated parts of the report in Inuktitut.

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## 1.0 INTRODUCTION

### 1.1 Objectives

The objectives of this survey were: (1) to assess the status of the nesting population of Common Eiders<sup>1</sup> in the Cape Dorset Bird Sanctuary and (2) to assess the importance of the Sanctuary to other bird and mammal species.

### 1.2 Historical background

Between 1939 and 1943, the Hudson Bay Company collected eiderdown on a large scale at Iqaluit, Lake Harbour and Cape Dorset, Northwest Territories (NWT). A total of 3 792 pounds of uncleaned down was collected, including 1 713 pounds from the Cape Dorset area (Cooch 1965). This project proved unprofitable and was terminated in 1942. It apparently caused the destruction of great numbers of Common Eider nests and a substantial decline in the regional population of eiders (Cooch 1965).

The idea of creating an eiderdown industry was revitalized by the Department of Northern Affairs and National Resources in the early 1950s (Cooch 1965). New initiatives were implemented, including an eider survey in Hudson Bay and Hudson Strait, in 1954 (Cooch 1954). That survey resulted in an investigation of eider breeding biology near Cape Dorset in 1955-56. Four areas with "eider farming" potential were identified: Sakkiak Island, the West Foxe Islands, Alareak Island, and some islands in Andrew Gordon Bay. An incomplete inventory carried out in 1955 indicated that there were at least 1 358 active nests and 5 876 old nest sites on some<sup>2</sup> of these islands. It was assumed that if eggging and hunting by local residents ceased, the number of active nests might

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<sup>1</sup> The subspecies Somateria mollissima borealis occurs in the Cape Dorset region and is sometimes called Northern Eider.

<sup>2</sup> Ooglukjuak, Blades, Tunitjuak, Dune, Coatsworth, Luke, Russell, Innuksuk, Sakkiak and South (or Illuviqtuuk) islands (Cooch 1965).

double within five years. Apparently as a result of hunting and egging, some excellent habitats were underpopulated, and most habitats were believed to support less than 20% of their carrying capacity (Cooch 1965).

As a result of Cooch's investigation, and with the support of local Inuit, the Cape Dorset Bird Sanctuary was created by Order-in-Council in 1958. The primary objective was to promote the establishment of an eiderdown industry (Allison 1977).

The creation of a Migratory Bird Sanctuary in 1958 coincided with numerous socio-economic changes at Cape Dorset, such as the establishment of numerous government services and a graphic art industry (Eber 1971, Eber 1975, Kemp 1976, Anon. 1990). Interest in developing an eiderdown industry apparently disappeared as new economic opportunities developed. Increasing numbers of powerboats also gave local hunters greater mobility (see Cooch 1976). This likely contributed to a further decline in the local eider population, and led to suggestions that the Migratory Bird Sanctuary had become irrelevant and should be abolished (Cooch 1976, 1977, 1981, 1986).

Following the release of the Northern Mineral Policy by the Department of Indian Affairs and Northern Development in December 1986, the Canadian Wildlife Service (CWS) undertook a review of the Migratory Bird Sanctuaries of the Northwest Territories. No new field studies were undertaken but the boundaries of the sanctuaries located north of 60°N were reviewed to assess whether the lands they contain are necessary to achieve the objectives for which the Sanctuaries were established (CWS 1989). The report suggested that the Cape Dorset Bird Sanctuary be abolished, pending a reassessment of the status of its breeding population of eiders.

## 2.0 STUDY AREA

The Cape Dorset Bird Sanctuary comprises approximately 40 islands and islets within 70 km of Cape Dorset (64°14'N 76°32'W; Fig. 1 and 2). Three outpost camps also occur near the Sanctuary: Shartowituk, Kangia and Isoktok (Fig. 1).

The area is a part of the Frobisher Uplands, a unit of the Davis region of the Canadian Shield (Bostock 1970). The south coast of the Foxe Peninsula, Baffin Island, is deeply indented and features thousands of islands. Exposed bedrock of variable topography predominates. Ridges, ravines and faults provide catchment basins forming numerous ponds and lakes.

Shallow areas surround many islands and are exposed at low tides. The tidal range is large (6-7 m) and tidal currents are strong. Sea ice conditions can be extremely variable during the spring and summer (Markham 1981). In 1991, as a result of relatively "normal" spring conditions, coastal waters near Cape Dorset were navigable in early July. Ice was abundant (covering ca. 40% of the water surface near Cape Dorset) during the first day of our survey (18-24 July 1991), but disappeared almost entirely later on. In 1990, late spring conditions did not allow navigation in coastal waters until late August (P.Ottokie, pers. obs.). The ice pack is usually open near Cape Dorset by 2 July, but entirely ice-free marine waters do not occur until August (Markham 1981).

The region is characterized by a low-arctic climate moderated by marine influences (Maxwell 1981, Ecoregions Working Group 1989). The average annual number of days with fog is 60 (Phillips 1990). For a more detailed description of the Sanctuary, see Cooch (1965).

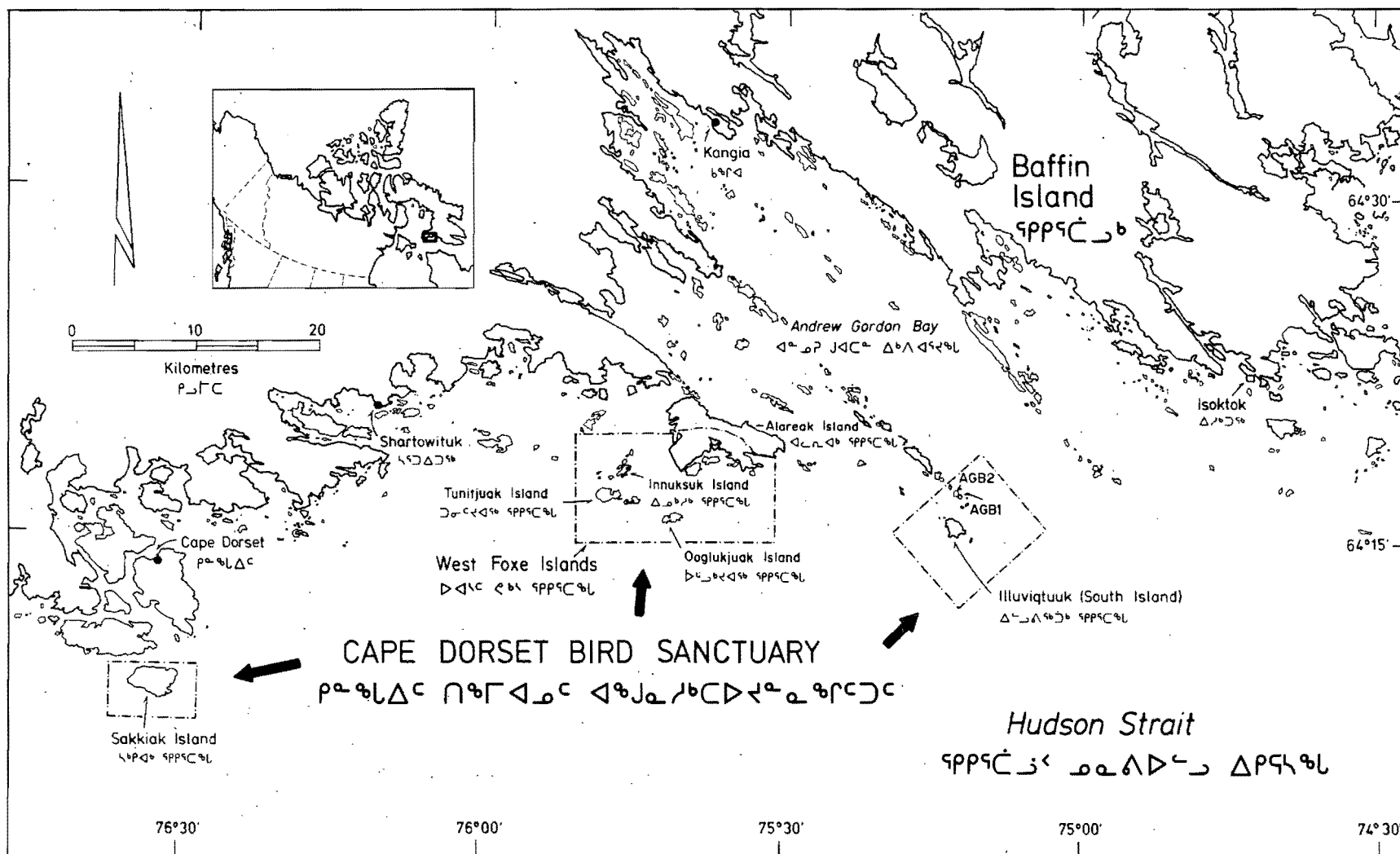


Figure 1. Location of the Cape Dorset Bird Sanctuary, NWT.

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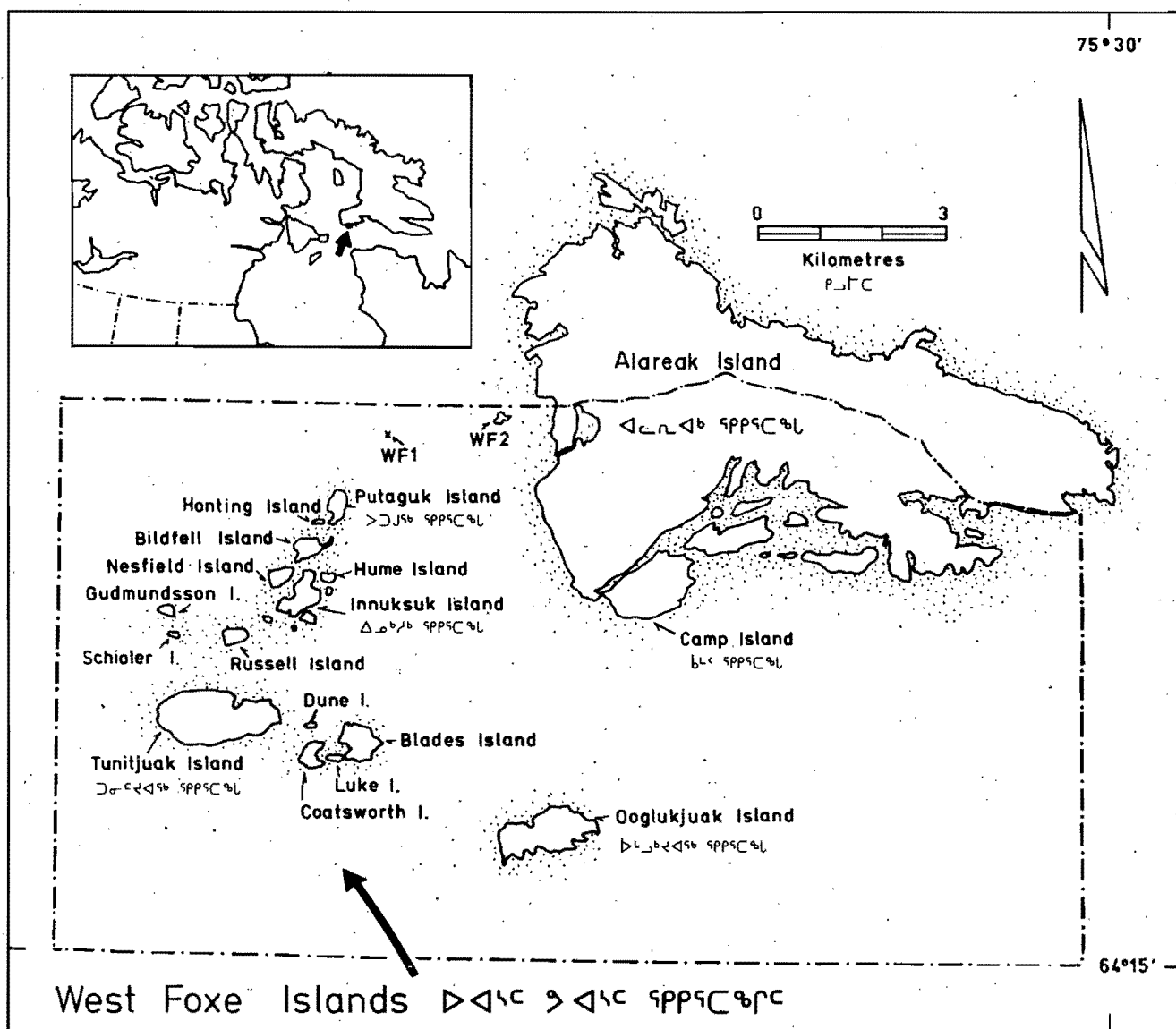


Figure 2. The West Foxe Islands and Alareak Islands, Cape Dorset Bird Sanctuary.

Figure 2. The West Foxe Islands and Alareak Islands, Cape Dorset Bird Sanctuary.

### 3.0 METHODS

#### 3.1 Survey techniques

We used a 22-foot motorboat to travel between Cape Dorset and the Migratory Bird Sanctuary. Ground counts of active eider nests<sup>3</sup> were conducted on 23 islands and islets. This was done by two to four persons positioned approximately 5-50 m apart, depending on terrain, visibility, and island size. Distance between observers was constantly adjusted to ensure the best possible coverage for each island, and to minimize the possibility of counting the same nest more than once. Nest searches of individual islands took from 15 minutes to eight hours, depending on island size. Almost all active nests were located by flushing incubating females. The distance at which female eiders reacted to an approaching observer varied considerably (0.5 to 30 m). A similar method was used in 1955, 1956, 1976 and 1981 (F.G. Cooch, pers. comm.).

After having recorded the clutch size, eggs were covered with down and the area vacated as quickly as possible. Old nest sites (cups without signs of use in 1991) were encountered frequently but were not counted.

In order to compare current and past habitat use by eiders, we also recorded two parameters documented in the past: presence of a shelter over or near the nests, and distance (estimated visually) between nests and the nearest water, marine or freshwater.

#### 3.2 Coverage

Our primary goal was to search for nests on islands that had been surveyed in the past, particularly the West Foxe Islands (Cooch 1965, 1981, 1986), in order to compare past and current numbers of nesting

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<sup>3</sup> Nests active in 1991, including nests with warm eggs or nestlings, or nests recently abandoned by hatchlings, or abandoned nests with cold eggs, or depredated nests apparently used in 1991.

eiders. However, time constraints, tides and weather conditions did not allow us to search four islands entirely, nor to visit about 20 minor islets near Alareak Is. and in Andrew Gordon Bay.

We searched the West Foxe Islands (ca. 370 ha in total) entirely except Ooglukjuak Island. We covered 80% of the latter island's 63 ha. We searched 20% of the portion of Alareak Island which is in the Sanctuary (1 357 ha), and all of nearby Camp Island (88 ha). In Andrew Gordon Bay, we searched 80% of Illuvituug Island (or South Island; 165 ha) and all of the two largest (9 and 24 ha) of 15 nearby islets which are in the Sanctuary. We walked around Sakkiak Island (596 ha) and searched all optimal eider nesting habitat (defined in Section 4.3), comprising a chain of lowlands and lakes in the center of the island. This accounted for only 40% of the surface of this large island. In total, we searched approximately 1 120 ha of the Sanctuary's 2 680 ha, or about 42% of the land area that it contains.

### 3.3 Methodological limitations

More than one nest survey on each island would have been necessary to assess the effectiveness of our survey methods and to determine margins of error. However, in light of practical considerations mentioned above, and the small size of most islands, we felt that one visit to each island was sufficient to get a reasonably accurate estimate of each island's nesting population of eiders.

Comparisons between our results and those of past surveys (Cooch 1965, 1981, 1986) must be made in light of the fact that although similar survey methods were used, nest search effort (i.e. surface specifically searched) on each island was likely not identical.

Estimates of active nests for the four islands that were not searched entirely (Sakkiak, Ooglukjuak, Alareak and Illuviqtuuk islands) are based on the assumption that nesting eiders were distributed uniformly on these islands.

#### 4.0 RESULTS AND DISCUSSION

##### 4.1 Number of nests and females.

We found 705 active nests of eiders throughout the Migratory Bird Sanctuary. This represents approximately 800 nests if we add the number of nests estimated to occur on four islands that were not searched entirely (Table 1). Based on our experience of islands and islets that we searched, we determined from the boat, without landing, that the 20 minor islets near Alareak Island and in Andrew Gordon Bay provided marginal eider nesting habitat and supported negligible numbers of active nests.

We found only three apparently depredated nests without eggs and with down scattered about, but we could not determine if they had been active in 1991. On at least 16 occasions, we could not locate nests after flushing a female from the ground.

Many eiders built their nest under or next to a shelter (rock, overhang, etc.). Accordingly, active nests were often well hidden and we may have missed some. Sixty-eight percent of the active nests were protected by a shelter, some of which were man-made<sup>4</sup>. In contrast with Cooch's (1965) earlier assessment (<10%) in relatively small study areas on Tunitjuak and Blades islands, a sizeable number of nests (>30%) were found in flat, open, grassy areas with no shelter. Incubating females were present on 96% of the active nests that we found. Unattended nests usually had warm eggs sprayed with fresh faeces, the result of a female leaving without being noticed.

We observed over 650 loafing adult eiders within the Sanctuary, including 210 females (Table 1). Most eiders were observed in flocks usually containing birds of the same sex. Loafing females were probably nonbreeders or failed breeders, but we could not determine how many had

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<sup>4</sup> Three-sided shelters with a roof, made with rocks by either local residents or F.G. Cooch and his team in the mid-1950s.



Table 1. Number of Common Eiders and nests in the Cape Dorset Bird Sanctuary, 18-24 July 1991.

Island	Size (ha)	Coverage <sup>1</sup> %	Active nests	Estimated <sup>2</sup> no. nests	Mean clutch size ± SE	Young	Loafing males	Loafing females	Loafing pairs
Sakkiak	596	40	3	8	3.33 ± 0.33	4	157	80	2
Tunitjuak	139	100	108	108	3.09 ± 0.09	0	25	23	0
Russel	13	100	9	9	2.89 ± 0.42	0	0	0	0
Schioler	4	100	0	0	-	0	0	0	0
Gudmundsson	6	100	2	2	3.50 ± 0.05	0	30	1	0
Nesfield	13	100	57	57	2.96 ± 0.15	0	0	0	0
Bildfell	15	100	14	14	2.86 ± 0.27	0	0	0	0
Ooglukjuak	63	80	125	156	3.15 ± 0.00	0	0	0	0
Blades	25	100	30	30	2.80 ± 0.14	0	2	20	0
Luke	5	100	10	10	3.60 ± 0.22	0	0	0	0
Innuksuk/Hume <sup>3</sup>	38	100	62	62	3.40 ± 0.12	0	1	23	0
Honting	4	100	22	22	3.45 ± 0.17	0	0	0	0
Putaguk	14	100	50	50	3.70 ± 0.14	0	1	10	0
Dune	5	100	5	5	2.60 ± 0.50	0	0	0	0
Coatsworth	19	100	4	4	3.50 ± 0.64	0	0	0	0
Alareak <sup>4</sup>	1357	20	3	15	-	0	116	2	0
Camp	88	100	0	0	-	0	57	0	0
WFI #1	<1	100	0	0	-	0	0	0	0
WFI #2	6	100	3	3	2.33 ± 0.33	0	50	0	0
Illuvigtuuk	165	80	171	214	3.16 ± 0.06	6	1	51	0
AGB #1	9	100	2	2	3.50 ± 0.50	0	1	0	0
AGB #2	24	100	25	25	3.08 ± 0.23	0	10	0	0
Total	2677	42	705	796	3.17 ± 0.03	10	451	210	2

1 Percentage of the island that was searched.

2 Estimated number of active nests with 100% coverage, assuming that nest density was uniform.

3 Includes all islets and islands accessible from Innuksuk Island at low tide, including Hume Island.

4 Approximately half of Alareak Island, or 1 357 ha, is in the Migratory Bird Sanctuary. Nests were searched only within the Sanctuary.

attempted to nest in the Sanctuary.

#### 4.2 Clutch size

Mean clutch size was  $3.17 \pm 0.03$  eggs (Table 1). We assume that most clutches were complete because a few eggs had already hatched (see below). This compares with with 3.44 eggs in 1956 ( $n=1298$ ; Cooch 1965) and 3.11 eggs in 1976 ( $n=429$ ; Cooch 1986). Cooch (1986) suggested that clutches were probably smaller in 1976 than in 1956 because bad weather delayed nest initiation, and on some islands, eiders had renested following eggging by people.

We observed few signs of hatching. We found only six ducklings on 23 July, on Illuvigtuuk Island, and four on 24 July on Sakkiak Island. They were approximately one to three days old. They were accompanied by hens and were swimming in ponds or small lakes. We did not find the nests from which the ducklings originated. In one nest, one egg had hatched minutes before our visit.

#### 4.3 Distribution of active nests

Seventy-one percent of the nests were located on 19 islands and islets of the West Foxe Islands, 28% on three islands in south Andrew Gordon Bay, and less than 1% on Sakkiak and Alareak islands (Table 1).

The West Foxe Islands are known to provide good eider nesting habitat. They have been used to monitor the sanctuary's eider population in the past (Cooch 1965, 1981, 1986). Eider nests were particularly numerous in the following areas: (1) near ponds and small lakes<sup>5</sup>, where brood-rearing occurs after the hatch; (2) areas covered with soil, vegetated or not, where birds could build a nesting cup; (3) areas with broken terrain and variable microtopography (e.g. hummocks,

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<sup>5</sup> We found that 57% of all nests were within 10 m of water, and 97% within 50 m. In 1956, Cooch (1965) found that 55% of the nests were within 60 m of water, and 94% within 300 m in some study areas.

tussocks, small terrasses, small cliffs and trenches), where nesting birds are less visible; and (4) areas cluttered with rocks and boulders, where potential nests shelters abound. These conditions were considered to be optimal nesting habitat and occurred regularly on the West Foxe Islands, where we also recorded the highest nest densities (e.g. Honting Island: 5.5 nests/ha; Nesfield Island: 4.38; Putaguk Island: 3.57; Ooglukjuak Island: 2.48; Luke Island: 2.0; Innuksuk Island: 1.63; Blades Island: 1.2; Dune Island: 1.0). Cooch (1965) also indicated that south-facing slopes where snow-free nesting sites occur early in the spring were also favoured by eiders.

Similar habitat conditions prevail on Illuvigtuuk Island, in Andrew Gordon Bay, where eider nests were also numerous (Table 1). Of all the islands that we searched Illuvigtuuk Island supported the largest number of active nests. With 1.3 nests/ha, it was also among the 10 islands with the highest nest densities. This was likely caused by three main factors: 1) this island is one of the largest in the Sanctuary; 2) most of this island is covered by optimal nesting habitat; and 3) it is likely less subject to human disturbance. Of all the Sanctuary's islands, it is the farthest (70 km) from Cape Dorset (Fig. 1). However, an outpost camp (Isoktok) occurs 25 km to the northeast.

We found only three active nests on Alareak Island after a four-hour search covering 20% of that section of the island which is in the Sanctuary (Fig. 2). We found no nest on adjacent Camp Island, which we searched entirely. Alareak and Camp islands, and nearby islets, have little or no soil and are relatively flat and featureless. Compared to the West Foxe or Illuvigtuuk islands, they provide marginal eider nesting habitat. More eiders used to nest on Alareak Island, but it has been subjected to heavy egging in the past (Cooch 1965). It is also joined to the mainland at low tide, and is large enough to support a population of weasels and foxes (Cooch 1965). This island has never been surveyed completely. It was originally included in the Sanctuary because it features sheltered marine waters and tidal pools that are good brood-rearing habitat for eiders nesting on the nearby West Foxe

Islands (Cooch 1965).

We found only three active nests on Sakkiak Island after an eight-hour search covering 40% of the island. Much of this large island consists of bare, rocky outcrops and 100<sup>+</sup>-m cliffs, and provides marginal nesting habitat for eiders. However, there are ponds and lakes surrounded by well vegetated lowlands where, as indicated by dozens of old nest cups, numerous eiders nested in the past. We concentrated our search in these lowlands and found only three active nests. The low numbers of eiders on Sakkiak Island has probably much to do with human disturbance. We saw much spent ammunition on the ground, and Cape Dorset is only 10 km away. The island has been heavily egged in the past (Cooch 1965).

#### 4.4 Evidence of predation

We observed little evidence of mammalian or avian predation. We found 16 eggs, apparently taken by gulls or ravens, within 1-50 m of active eider nests. We found most depredated eggs (10) on Ooglukjuak Island, where the largest gull colony is located. Iceland, Glaucous and Herring gulls were the most common and widespread potential predators throughout the Sanctuary.

We saw one Common Raven on Tunitjuak Island, where three inactive raven nests were found on a small cliff. We saw one Peregrine Falcon on the ground near eider nests on Ooglukjuak Island, but found no evidence of predation. One Arctic Fox was present on Camp Island, where we did not find any old or active eider nests. In contrast with earlier accounts (Cooch 1965, 1977), we did not see jaegers.

On the other hand, we observed signs of human presence (abandoned camping, hunting and trapping equipment, spent ammunition, litter, etc.) on most islands. There was one camp (the occupants were not present during our visit) on Innuksuk Island, where we found collected eider eggs and down, and remains of eiders. We were unable to determine how many nests had been affected by egg and down collections.

#### 4.5 Past and current populations of nesting eiders

If we compare past and current estimates of the breeding populations of eiders, it must be done in light of the methodological limitations outlined above, and in view of the fact that the Sanctuary has never been surveyed entirely. Also, the number of nests recorded in 1976 was likely affected by adverse weather and ice conditions (Cooch 1986). The most comprehensive information available comes from the West Foxe Islands, which were searched entirely in 1956 and 1991, and partially in 1976 and 1981 (Cooch 1965, 1981, 1986).

Nest counts at 13 of the West Foxe Islands, in July 1956 and 1991, suggest that the nesting population of eiders has declined by approximately 60% in this archipelago (Table 2). The number of nests was higher on some islands in 1991, but lower on others, particularly Tunitjuak Island. Nest counts from 1956, 1976, 1981 and 1991 at four West Foxe Islands indicate that this population never ceased to decline since the Sanctuary was established (Table 3).

On Sakkiak Island, following an incomplete survey after the hatch, on 16 August 1955, Cooch (1965) estimated that nearly 380 nests had been used that year. He also indicated that "many more eiders are known to use the area". On 24 July 1991, after having walked around the entire island and having paid particular attention to the areas with good eider nesting habitat, we found only three active nests with eggs and one brood on a lake.

The only island where we found more active nests than in the past was Illuvigtuuk Island, in Andrew Gordon Bay: 171 nests compared to 98 nests in 1955 (Cooch 1965).

#### 4.6 Significance of the eider population nesting in the Sanctuary

Assuming that the national population of northern Common Eiders Somateria mollissima borealis comprises 93 000 breeding pairs (Abraham and Finney 1986), and that approximately 800 pairs nest in the

Table 2. Number of active eider nests at 13 of the West Foxe Islands in 1956 and 1991 (islands for which data are available).

Island	Number of nests	
	18-23 July 1956	18-24 July 1991
Bildfell	36	14
Gudmundsson	26	3
Innuksuk + Hume	111	62
Ooglukjuak	86	132
Nesfield	21	58
Blades	102	30
Dune	22	5
Honting	16	22
Russell	47	9
Schioler	36	0
Putaguk	26	50
Tunitjuak	755	108
Total	1284	493

Table 3. Number of active eider nests at four of the West Foxe Islands, 1956, 1976, 1981 and 1991 (islands for which data are available).

Island	1956	1976	1981	1991
Innuksuk	94	153	100	62 <sup>1</sup>
Blades	102	159	189	30
Russell	47	27	30	9
Tunitjuak	755	56	68	108
Total	998	395	387	209

<sup>1</sup> Includes Hume Island.

Sanctuary, less than 1% of that population currently breeds in the Sanctuary. Thus, the designation of Key Habitat Site (Alexander et al. 1991) given to the Sanctuary is not entirely warranted. Several Key Habitat Sites with much larger number of eiders have been identified for this subspecies in other areas of the eastern Canadian Arctic (Alexander et al. 1991).

Nonetheless, more than 1% of the national population of northern Common Eiders may nest along the north coast of Hudson Strait. Following aerial surveys in the early 1980s, Gaston and Cooch (1986) suggested that there were probably at least 10 000 pairs of Common Eiders between Cape Dorset and Markham Bay, a large bay located 250 km east of Cape Dorset.

#### 4.7 Other bird and mammal species in or near the Sanctuary

Excluding Common Eiders, we observed 22 species of birds during our survey and found droppings of Rock Ptarmigan and feathers of Snowy Owl (Appendix 1). Combined with past observations (Macpherson 1959, Cooch 1965, 1977, 1981, Bromley 1983, Bromley and McLean 1986), at least 58 species have been reported in or near Cape Dorset Bird Sanctuary since 1956 (Appendix 2). We did not record any significant observation of mammals during our survey (Appendix 1).

##### 4.7.1 Black Guillemot

Black Guillemots were the most numerous birds during our survey. We recorded nearly 2 600 individuals and found over 20 active nests incidentally while searching for eider nests. Intensive searches in rock crevices and under boulders would have yielded a considerably larger number of nests. The largest concentration of adults (575) occurred at Ooglukjuak Island.

There were apparently more guillemots in the Sanctuary in the past. F.G. Cooch (pers. comm.) estimated that there were 2 500<sup>+</sup> guillemots on Russell Island alone, where he banded 500 individuals in 1955. However,

rigorous counts of guillemots have never been done in the Sanctuary.

Biologists have tried to estimate the size of guillemot breeding colonies using correction factors and visual counts of birds on the water, near nesting sites. Several counts are necessary for each colony, and factors such as time of the day, weather conditions, and stage in breeding season must be considered (Cairns 1979, Ewins 1985). From our single counts at each site we cannot estimate the size of the breeding population of guillemots in the Sanctuary. All birds observed had the typical plumage of breeding adults.

Assuming that the national population comprises approximately 70 000 pairs (Nettleship and Evans 1985), the Cape Dorset area, including the Migratory Bird Sanctuary and other islands along the north coast of Hudson Strait may support over 1% of the Canadian breeding population. Gaston (1991) suggested that Nettleship and Evans' (1985) estimate of 10 000 pairs for Hudson Strait, eastern Hudson Bay, western Foxe Basin and southeast Baffin Island was probably too low by a factor of at least three.

#### 4.7.2 Gulls

Gulls were also common, particularly Iceland Gulls. All Iceland Gulls appeared to be Larus glaucooides kumlieni, a subspecies also known as Kumlien's Gulls (see Macpherson 1961, Godfrey 1986). In contrast to Glaucous and Herring gulls, and as reported by Macpherson (1961), Iceland Gulls always nested in colonies. The largest colony was on Ooglukjuak Island and comprised 57 nests, most of which (31) were empty. Six nests contained one egg, 19 nests contained two eggs, and one nest contained three eggs. Approximately 150 birds, including breeders and nonbreeders, were present at the colony site.

The second largest gull colony was on the cliffs of Sakkiak Island. It comprised 40 adult Glaucous Gulls and 23 nests, most of which (18) were empty. One nest contained two eggs, and six young were present in or near the other four nests. The oldest nestlings were approximately



10-15 days old. The third largest colony was also located on Sakkiak Island. It comprised 15 adults and seven young Iceland Gulls in four nests. The young were less than one week old.

#### 4.7.3 Falcons

The Cape Dorset region is also known for its population of Peregrine Falcons and Gyrfalcons. Up to 50 nests sites have been located in the region (Bromley 1983, Bromley and McLean 1986). This prompted the recognition of the Cape Dorset area as an "Area of Special Interest" for raptors (Ferguson 1987). We saw only one Peregrine Falcon during our survey. We suspect that Peregrines occasionally prey on eiders. Prey remains at Gyrfalcon nests sites have indicated that this species feeds largely on guillemots and gulls (Bromley and Mclean 1986).

#### 4.7.4 Canada Goose

Other observations of interest include those of a small race of Canada Goose, probably Branta canadensis hutchinsii. We found four families with goslings (the oldest were 15-20 days old) on the cliffs of Sakkiak Island, near the Glaucous Gull colony. The occurrence of geese on the cliffs appeared unusual, particularly in light of the presence of more typical goose habitat in the interior of the island: large, flat and well vegetated areas surrounding lakes and ponds. This was the largest concentration of geese that we saw. According to Macpherson (1961), both Branta canadensis hutchinsii and B. C. interior occur in this region.

### 5.0 CONCLUSION AND RECOMMENDATIONS

1) Evidence of a decline in the breeding population of Common Eiders of the West Foxe Islands since 1955-1956 was recorded in 1976 and 1981, and substantiated in 1991. Also, nesting eiders have almost disappeared from Sakkiak and Alareak islands, but more active nests were found on Illuviktuuq Island, in Andrew Gordon Bay. Overall, the nesting eider population of the Cape Dorset Bird Sanctuary has declined substantially

since the Migratory Bird Sanctuary was established in 1958.

2) Human disturbance, including hunting and eggging, apparently caused this decline. It is unlikely that the population of nesting eiders will recover to former levels if human disturbance at nesting islands continues unabated. Since local Inuit have been hunting in this area for decades and the Sanctuary is in Cape Dorset's "backyard", it is also unlikely that human disturbance will cease.

3) The original objective of the Migratory Bird Sanctuary - the establishment of a commercial eiderdown industry - has never been met. Currently, there appears to be no interest in developing a commercial eiderdown industry at Cape Dorset. It is doubtful that the Sanctuary's current population level could support a viable, commercial eiderdown industry (see McDonald and Fleming 1990).

4) The Cape Dorset Bird Sanctuary supports less than 1% of the Canadian breeding population of northern Common Eiders. Several other sites in the Canadian eastern Arctic support larger numbers of nesting eiders. Other islands along the north shore of Hudson Strait, east of the Sanctuary, may support significant numbers of nesting eiders.

5) More than 1% of the national population of Black Guillemots may breed in and near the Cape Dorset Bird Sanctuary. Significant numbers of guillemots likely nest east of the Sanctuary, along the north shore of Hudson Strait, as well.

6) During a visit to Cape Dorset and a meeting with the local Hunters and Trappers' Association, in July 1991, most residents that we talked to seemed to know little about the Sanctuary's history, purpose and specific location. HTA members agreed that the future of the Sanctuary should be discussed in a public meeting.

Accordingly, we recommend that:

- a) The Cape Dorset Bird Sanctuary be abolished.
- b) Concentrations of eiders and guillemots along the north coast of Hudson Strait be identified in the next decade by 1) collecting information from Cape Dorset and Lake Harbour residents, and 2) by subsequently carrying out boat surveys, and that a new protected area be designated if and where the number of birds warrant it.
- c) These conclusions and recommendations be discussed by Cape Dorset residents and HTA members, and the Nunavut Wildlife Management Board.

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Appendix 1. Bird species other than Common Eiders and mammals observed in and near the Cape Dorset Bird Sanctuary, 18-24 July 1991.

pecies	Sak	Tun	Rus	Sch	Gud	Nes	Bil	Oog	Bla	Luk	Inn	Hon	Put	Dun	Coa	Ala	Cam	WF1	Ill	A#2	A#3	ENR
ed-throated Loon	31	4	-	-	-	-	-	-	1	-	-	-	-	-	-	6	-	-	5	-	-	-
acific Loon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	1	-	-	-
orthern Fulmar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
anada Goose	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21	-	-	-	-	-	-
ing Eider	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	6	-	-	-
ldsquaw	16	2	-	-	-	-	-	-	-	-	-	-	-	-	-	13	1	-	3	-	-	-
ed-breasted Merganser	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
eregrine Falcon	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
tarmigan sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	dro	-
esser Golden-Plover	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
emipalmated Plover	4	7	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	2	-	-	-
anderling	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-	-	-	-	-	-	-	-
emipalmated Sandpiper	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
hite-rumped Sandpiper	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	-	-	3	-	-	-
urple Sandpiper	2	-	-	-	-	-	-	-	2	2	6	-	-	-	-	7	2	-	2	-	-	-
erring Gull	20	1	4	-	1	2	3	4	-	-	4	-	-	-	2	6	-	-	2	-	-	-
celand Gull	22	-	-	-	-	-	-	150	-	-	-	-	-	-	-	-	-	-	-	-	-	-
laucous Gull	76	2	-	1	2	-	-	-	-	4	1	-	2	-	-	5	1	2	-	2	-	-
hick-billed Murre	1	6	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	60	-	-	20
lack Guillemot	25	445	115	20	110	30	10	575	225	-	-	60	70	40	40	-	-	-	115	30	280	400
nowy Owl	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	fea	-
ommon Raven	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
merican Pipit	10	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
now Bunting	32	14	1	-	-	2	1	7	5	-	5	-	-	-	-	-	-	10	9	-	3	-
rtctic Hare	-	1	1	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	1	-
rtctic Fox	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
olar Bear <sup>3</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
alrus <sup>4</sup>	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
inged Seal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
arren-ground Caribou <sup>5</sup>	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Sak: Sakkiak Island	Nes: Nesfield Is.	Inn: Innuksuk Is.	Ala: Alareak Is.	A#3: AGB#3
Tun: Tunitjuak Is.	Bil: Bildfell Is.	Hon: Honting Is.	Cam: Camp Is.	ENR: En route between
Rus: Russell Is.	Oog: Ooglukjuak Is.	Put: Putaguk Is.	WF1: WFislest #1	Cape Dorset and
Sch: Schioler Is.	Bla: Blades Is.	Dun: Dune Is.	Ill: Illuvigtuk	Mig. Bird Sanct.
Gud: Gudmundsson Is.	Luk: Luke Is.	Coa: Coatsworth Is.	A#2: AGB#2	

Only droppings were found. In light of local habitat characteristics, we suspect that they were from Rock Ptarmigans.  
Three feathers were found at one location.  
One female and two cubs at Cape Dorset.  
Walrus was found dead in a tidal pool.  
Caribou droppings were observed on several islands.

Appendix 2. Bird species recorded in or near the Cape Dorset Bird Sanctuary, 1954-1991.

Common name <sup>1</sup>	Scientific name <sup>1</sup>	Status <sup>2</sup>
Red-throated Loon	<u>Gavia stellata</u>	CB
Pacific Loon	<u>Gavia pacifica</u>	Cb
Common Loon	<u>Gavia immer</u>	CT
Yellow-billed Loon	<u>Gavia adamsii</u>	RT
Northern Fulmar	<u>Fulmarus glacialis</u>	RT
Tundra Swan	<u>Cygnus columbianus</u>	RT & b
Brant	<u>Branta bernicla hrota</u>	RB
Canada Goose	<u>Branta canadensis interior</u>	RB
	<u>Branta canadensis hutchinsii</u>	UB
Lesser Snow Goose	<u>Chen caerulescens caerulescens</u>	CM; RB
Green-winged Teal	<u>Anas crecca</u>	RT
Northern Pintail	<u>Anas acuta</u>	RT
Common Eider	<u>Somateria mollissima borealis</u>	CB
King Eider	<u>Somateria spectabilis</u>	CM, Ub
Oldsquaw	<u>Clangula hyemalis</u>	CM; UB
White-winged Scoter	<u>Melanitta fusca</u>	UT & Mo
Red-breasted Merganser	<u>Mergus serrator</u>	UB
Rough-legged Hawk	<u>Buteo lagopus</u>	CB
Peregrine Falcon	<u>Falco peregrinus</u>	UB
Gyr Falcon	<u>Falco rusticolus</u>	UB
Rock Ptarmigan	<u>Lagopus mutus</u>	UB & Re
Black-bellied Plover	<u>Pluvialis squatarola</u>	RT & M
Lesser Golden-Plover	<u>Pluvialis dominica</u>	RT & M
Semipalmated Plover	<u>Charadrius semipalmatus</u>	CB
Ruddy Turnstone	<u>Arenaria interpres</u>	CM
Sanderling	<u>Calidris alba</u>	UT
Semipalmated Sandpiper	<u>Calidris pusilla</u>	CB
Least Sandpiper	<u>Calidris minutilla</u>	UM
White-rumped Sandpiper	<u>Calidris fuscicollis</u>	CB & M
Baird's Sandpiper	<u>Calidris bairdii</u>	UM
Purple Sandpiper	<u>Calidris maritima</u>	CB & M
Dunlin	<u>Calidris alpina</u>	UM
Red-necked Phalarope	<u>Phalaropus tricolor</u>	UM
Red Phalarope	<u>Phalaropus fulicaria</u>	CM
Pomarine Jaeger	<u>Stercorarius pomarinus</u>	RT
Parasitic Jaeger	<u>Stercorarius parasiticus</u>	CT & b
Long-tailed Jaeger	<u>Stercorarius longicaudus</u>	UT
Herring Gull	<u>Larus argentatus</u>	CB
Iceland Gull	<u>Larus glaucoides kumlieni</u>	CB
Glaucous Gull	<u>Larus hyperboreus</u>	CB
Great Black-backed Gull	<u>Larus marinus</u>	RT
Black-legged Kittiwake	<u>Rissa tridactyla</u>	RT
Sabine's Gull	<u>Xema sabini</u>	RT & b
Arctic Tern	<u>Sterna paradisaea</u>	UT & b



Appendix 2. Continued.

Common name <sup>1</sup>	Scientific name <sup>1</sup>	Status <sup>2</sup>
Thick-billed Murre	<u>Uria lomvia</u>	CT
Razorbill	<u>Alca torda</u>	RT
Black Guillemot	<u>Cepphus grylle</u>	CB
Snowy Owl	<u>Nyctea scandiaca</u>	RB
Eastern Kingbird	<u>Tyrannus tyrannus</u>	Ac
Horned Lark	<u>Eremophila alpestris</u>	CM
Common Raven	<u>Corvus corax</u>	UB
Northern Wheatear	<u>Oenanthe oenanthe</u>	RB
American Pipit	<u>Anthus rubescens</u>	CB
Yellow-rumped Warbler	<u>Dendroica coronata</u>	Ac
White-throated Sparrow	<u>Zonotrichia albicollis</u>	Ac
White-crowned Sparrow	<u>Zonotrichia leucophrys</u>	RT
Lapland Longspur	<u>Calcarius lapponicus</u>	CB & M
Snow Bunting	<u>Plectrophenax nivalis</u>	CB & M
Common Redpoll	<u>Carduelis flammea</u>	UM

<sup>1</sup> AOU (1983, 1985, 1989).

<sup>2</sup> R: rare; U: uncommon; C: common; Ac: Accidental; T: transient;  
M: migrant; Mo: moulter; B: confirmed breeder; b: suspected breeder;  
Re: resident.

N.B. The status of some species may change significantly over time. For example, Lapland Longspur was a common nesting species in 1955 and 1956, but it was rare in 1976 and absent in 1991. Semipalmated Sandpiper was a common breeding species in 1955 and 1956 but only one individual was seen in 1976 and 1991.

Sources: Macpherson (1959); Cooch (1965, 1977, 1981); Bromley (1983); Bromley and McLean (1986); Sirois and Kay (1993).

### Appendix 3. Summary of key information in Inuktitut.

1.0 ກ່ຽວກັບ ດຳລັດ

### 1.1 ၂၄၆၆၄၁

[illegible]

1.2  $\Gamma \vdash \Delta \Rightarrow \Gamma \vdash \Delta$   $\Gamma \vdash \Delta \Rightarrow \Gamma \vdash \Delta$

[illegible][illegible]

ᐱ ᑕᓚᐅᐸ ᑦᑎᐃᓂᔭᖃᑕᐃᒪᑦ ᖃᑦᑐᐳᐊᑕᑦ Somateria mollissima borealis-ᑥᐄᑆᖃᑕᑦ ᑦᑎᐃᓂᔭᖃᑕᐃᒪᑦ ᐃᐳᐅᐣᖃᑕᐃᒪᑦ ᑦᑎᐃᓂᔭᖃᑕᐃᒪᑦ ᑕᓚᐅᐣ.

2 ትጋረፍ, Blades, ጋፍረፍ, Dune, Coatsworth, Luke, Russell. ልግግ. ነግፍ ለጋ ልጋልጋፍ ምግግር.





[illegible]

2.2  $D^c \supset \mathbb{R}^c \hookrightarrow D^{qb} C D^c \cong \mathbb{R}^L \mathbb{R}^c$

[illegible][illegible][illegible]

5D-ጋሃኖ 57-ጎሳኖ ልሊድ 'ፔቦንትሮፕሊር 10 ገጋ'ው 'ፔቦቡርጋብ' ላሂጋ  
97-ጎሳኖ 50 ገጋ'ው 'ፔቦቡርጋብ'. 1956-ገ, Cooch (1965) 'ፔፕረፕሪሲሂር ድጋሃኖ  
55-ጎሳኖ 60 ገጋ'ው ልሊጽ 'ፔቦቡርጋብ' . ላሂጋ 94-ጎሳኖ 300-ገጋ'ው 'ፔቦቡርጋብ'







2.5 ንፍሃድሚኦ ንፍሊኦ ለፍልጎር፡፡ ለፍልጎር፡፡ ለፍልጎር፡፡ ለፍልጎር፡፡ ለፍልጎር፡፡

[illegible][illegible]

**3.0**      ᐃᓯᓯᑦ ᐅᓴᐅᑦ ᓂᓲᐅᑦ, ᐱᓐᐱᐅᑦ ᐅᐸᐸᓴᓴᓂᑦ ᓴᓂᓯᓴᓂᑦ,

ለኤምባሲዎች ምክር ቤት 22-ኛው ምዝገባ በሚገኝ ርዕስ ስር  
 የፍትሕ ምክር ቤት ልማት ምክር ቤት ርዕስ ስር ስለሚገኝ ርዕስ ስር  
 (የሚገኝ ርዕስ ስር 1-፡፡) የሚገኝ ርዕስ ስር ርዕስ ስር (Macpherson 1959,  
 Cooch, 1965, 1977, 1981, Bromley 1983, Bromley ርዕስ ስር Mclean 1986),  
 58-ኛው ምዝገባ በሚገኝ ርዕስ ስር የሚገኝ ርዕስ ስር ርዕስ ስር  
 ለፍትሕ ምክር ቤት ልማት ምክር ቤት 1956-፡፡ (የሚገኝ ርዕስ ስር 2-፡፡)  
 የፍትሕ ምክር ቤት ልማት ምክር ቤት ርዕስ ስር (የሚገኝ ርዕስ ስር 1).

### 3.1 ለጥያቄ

[illegible][illegible]

ᐱᑦᓂᕈᓪ ᓄᕋᓴᓂᕐ ᐃᕐᓂᕈᓪ ᐱᐅᓂᐅᕐᒃ 13-ᓂᕐ West Foxe  
 ᓄᕋᓂᐅᕈᓪᓂᕐ 1956-ᑦ ᐱᕐᓴᓴ 1991-ᑦ (ᓄᕋᓂᐅᕐ ᓂᐃᕈᕋᓂᐅᕈᓲᕐ).

[illegible]

1 ለፍጥረትና ስራ ምክር ቤቱ





Appendix 4. Poster made by Nuyaliak Mathewsie (Pitseolak School, Cape Dorset) for the 1985 National Wildlife Week poster contest.

Δελφίνια σπονδύλινος Ρωμαιο-Κυβερνήτης 4. ΔΡωμαιο-Κυβερνήτης Δελφίνιος 1985-Γ  
 βαλάντιο ΠΟΝΤΟΣ-ΠΕΛΑΓΟΣ ΔΕΛΦΙΝΙΟΝ ΛΑΛΕΙΝ ΤΟΝ ΑΝΘΡΩΠΟΝ ΔΕΛΦΙΝΙΟΝ  
 ΔΕΛΦΙΝΙΟΝ-ΠΟΝΤΟΣ ΡΩΜΑΙΟΣ.

