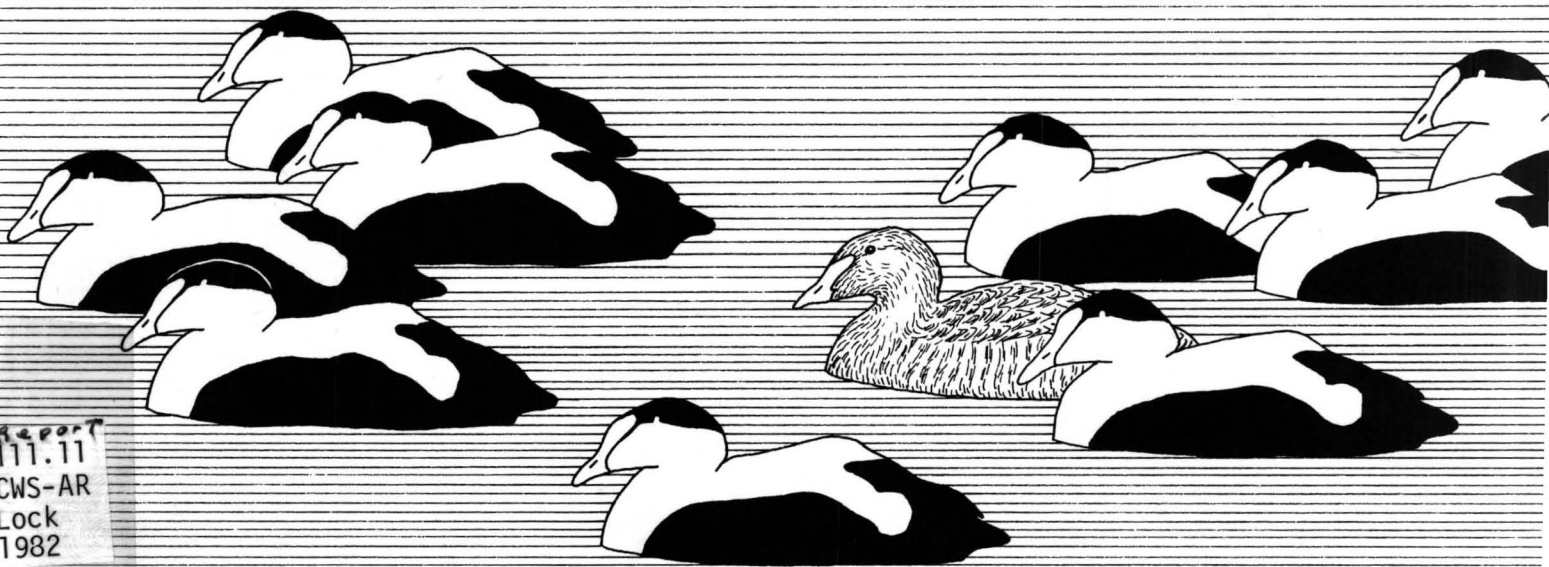


# AN ASSESSMENT OF THE LABRADOR BREEDING POPULATION OF THE COMMON EIDER



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An Assessment of the Labrador Breeding  
Population of the Common Eider

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TABLE OF CONTENTS

	<u>Page</u>
List of Tables .....	ii
List of Figures .....	iii
Abstract .....	1
Introduction .....	2
Methods .....	6
Results .....	10
Discussion .....	24
Acknowledgements .....	30
References .....	31

LIST OF TABLES

<u>Table No.</u>		<u>Page</u>
1	Numbers of waterfowl counted on the June, 1980 aerial survey of the Labrador coast .....	11
2	Common Eider colonies in Northern Labrador .....	14
3.	Common Eider colonies in Southern Labrador .....	15
4.	The numbers of active nests of Common Eiders on six segments of the Labrador coast compared with numbers of adult males counted on aerial and boat surveys .....	17



LIST OF FIGURES

<u>Figure No.</u>		<u>Page</u>
1	Aerial survey track near Makkovik .....	7
2	The coast of Labrador .....	9
3	Numbers of adult male Common Eiders counted on the June 1980 aerial survey .....	12
4	Numbers of "brown" eiders counted on the June 1980 aerial survey .....	13
5	Common Eider colonies to the south of Grenfell Sound .....	18
6	Some of the Galvano Islands showing positions of Common Eider colonies .....	19
7	Common Eider colonies in Seven Islands Bay .....	20
8	The position of the Ramah Bay Common Eider colony .....	21
9	Common Eider colonies near Hebron .....	22
10	Common Eider colonies near Table Bay .....	23

## ABSTRACT

In 1980 and 1981 the Canadian Wildlife Service worked on the coast of Labrador to determine the distribution of Common Eiders (Somateria mollissima) along the coast in breeding season and to estimate the size of the breeding population. A detailed aerial survey of the entire coastline was carried out in June 1980 and in the summer of 1981 colony censuses were done by two field parties, one in northern and one in southern Labrador.

Eiders breed irregularly along the coast with greatest numbers between 53°N and 57°N. In the two ground census areas, 4864 nests were found and 5419 adult males were counted in these same areas during the 1980 aerial survey: a ratio of 1:1.11 males per active nest. This is very close to the expected 1:1 ratio and the discrepancy is ascribed a dispersal of some males from the census areas after breeding and to incomplete censusing of the southern area. Fourteen thousand pairs of eiders are calculated to breed on the coast of Labrador and on the basis of some slender historical evidence it is concluded that the present breeding population is larger than that at the turn of the century.

## INTRODUCTION

Since 1978 the Canadian Wildlife Service, with support from Petro-Canada under the OLABS Program, has been investigating the numbers and distribution of marine birds on the coast of Labrador. The greater part of this work has been in locating and censusing alcid and larid colonies (Lock 1979) but in 1980 a two year project was started which was designed to assess summering waterfowl populations in Labrador coastal waters and to allow an accurate census of breeding Common Eiders.

In eastern America, Common Eiders breed on the coasts from southern Massachusetts to the Canadian High Arctic. Two subspecies occur on the Atlantic coast: S. m. borealis breeding in the northern part of the range and S. m. dresseri in the south. The zone of overlap centres on Groswater Bay in Labrador, extending from about 53° N to about 55° 30' N (Mendall 1980). Eiders are abundant, and breeding distribution is continuous throughout this range wherever suitable nesting habitat is found, except on the island of Newfoundland where intense human persecution has reduced the breeding population to a few hundred pairs, some nesting on isolated islands in fresh water lakes (R.I. Goudie, pers. comm.).

Because so much time is required to carry out accurate nest counts, a complete census of breeding Eiders has been made at only one of their breeding concentrations in Eastern Canada: the colonies in the St. Lawrence Estuary (Reed, 1973). Attempts to carry out aerial counts of breeding females are typically confounded by the similarity of immature birds of both sexes to adult females and the inconspicuousness of these essentially "brown" birds. However, in his aerial censuses of eiders breeding in Maine, Mendall (1968) counted all eiders seen and he was able

to classify a sufficient number of them that age/sex structure and population size could be reliably deduced.

Scandinavian workers (Almkvist and Andersson 1972, Almkvist et al. 1975, Andersson 1979) have found aerial counts of adult males to be an accurate method of estimating the size of the breeding population. In northern Europe breeding males gather after breeding in large, easily counted and photographed flocks at the seaward edges of the island groups on which breeding occurred. The number of breeding pairs in each area was found to be equivalent to the number of adult males counted.

When the problem of censusing breeding eiders in Labrador was confronted the difficulties of travel on the coast and the large number of islands to be searched prohibited any attempt to census the population by nest counts. It seemed that the simplest method of assessing the size and distribution of the breeding population would be by doing aerial counts of adult males shortly after the initiation of clutches. Such counts were made between 6 June and 9 July 1980 (Lock 1980) and it became apparent that, contrary to the European experience, in Labrador males did not gather in large flocks, but rather dispersed in smaller flocks which were observed deeper in the bays and closer inshore. Our lack of knowledge of the post-breeding dispersal of Labrador eiders and the observed differences from the northern European pattern prevented any confident assumption that the number of pairs breeding in Labrador was equivalent to the number of males counted. To make a reliable estimate of the breeding population, it was necessary to determine, on wide areas of the Labrador coast, both the numbers of active nests and the number of adult males present immediately following clutch initiation. It was not possible to carry out aerial

surveys and nest counts in the same breeding season but we made nest counts on all islands on two substantial portions of the Labrador coast in 1981 and correlated these with aerial counts of males made in the same regions in the 1980 breeding season.

Areas for ground censusing were selected by the following criteria:

1. The area should contain a substantial breeding population; preferably greater than 1000 pairs.
2. It should be spatially isolated from other breeding concentrations in order that birds breeding in one area would be less likely to have moved to an adjacent area.
3. It should be of such a size that it could be censused by one field party in a single breeding season.

That section of coast north of 58° N appeared to satisfy these criteria but selection of a second ground census area was more difficult. There are notable irregularities in the distributions of adult male and "brown" eiders along the Labrador coast in June but it is apparent that these distribution patterns are very similar, with concentrations around St. Peter Bay, on the coast south of Groswater Bay, and in Nain Bight.

The concentration around St. Peter Bay was shown by a later inspection to have been composed either of non-breeding birds at a migratory staging point or of post-breeding birds from another area. The concentration in Nain Bight was thought to be insufficiently isolated from birds breeding to the south of it, and the many islands in that region could not be censused in one season. In southern Labrador the colonies between Black Tickle and Pompey Island are separated from a breeding concentration on the north shore of Groswater Bay by a 70-80 km stretch of coastline with few

islands and on which eiders breed. This breeding concentration was selected for censusing but because of the nearness to colonies in Groswater Bay was considered less satisfactory than the area chosen in northern Labrador.

## METHODS

The aerial survey was carried out from a Cessna 185 on floats flown at a height of 75 m (250 ft) and a speed of 160 kmph (100 mph) on a course approximately 120 m (400 ft) offshore. Every bay, fjord and inlet was examined and the flight line was extended to offshore islands and shoals. Figure 1 is a map of part of the Labrador coast on a scale of 1/250,000 showing a typical survey track. At the time of this survey high octane aviation fuel was available at only a few places on the coast and large amounts of fuel had to be carried inside the aircraft, allowing no room for a second observer. The pilot located waterfowl on his side of the survey path and made counts of smaller flocks, I counted all flocks of more than about 20 birds. The numbers and locations of all waterfowl seen were recorded on tape and the survey track was marked on 1/250,000 scale topographic maps.

All waterfowl observed were counted and areas of waterfowl habitat not immediately on the survey path were examined with 8 x 30 binoculars. All birds seen were counted carefully; by individuals in small flocks, by fives and tens in larger flocks. No guesses or vague estimates were made. Large flocks were circled at a suitable height and repeat counts were made of each flock to ensure accuracy. When mixed-sex flocks of eiders were encountered, adult males were counted first then either the adult females and immatures which were, together, categorised as "brown" birds were counted or their number was determined by subtracting the count of adult males from the count of the whole flock. If little time was available, the adult males were counted first, and the number of "brown" birds were

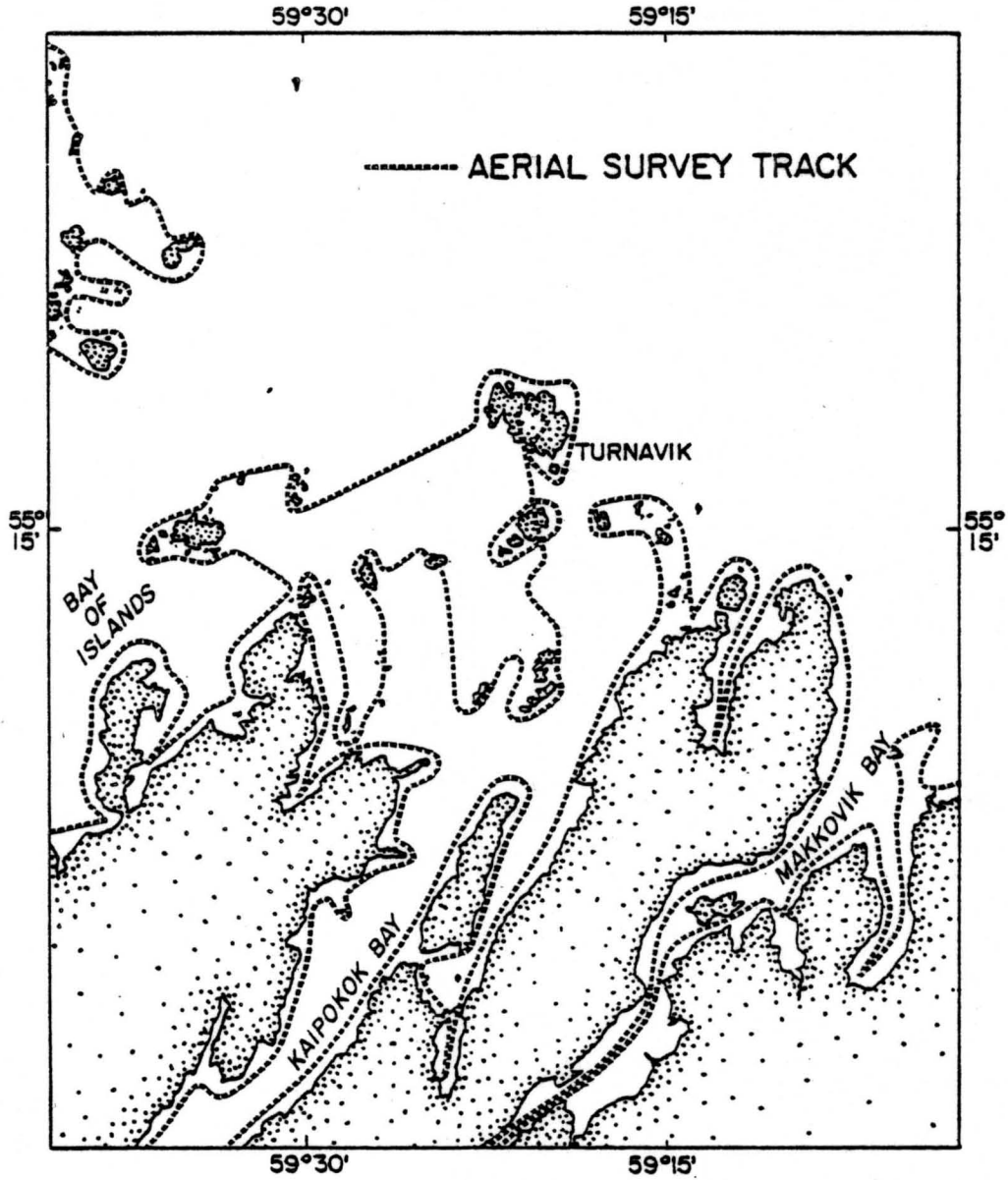


Figure 1. Aerial survey track near Makkovik.



derived from an estimation of the ratio of "brown" birds to adult males in the flock.

The general course of the survey was from south to north in order that each section of the coast might be censused at roughly the same part of the breeding cycle, but because of the time required to fly the entire coast it was not possible to synchronize the survey exactly with the beginning of incubation. Examination of the coast south of  $53^{\circ}\text{N}$  (Fig. 2) and parts of the north shore of Groswater Bay on 6-8 June showed that egg-laying had barely started; accordingly, the survey north of  $53^{\circ}\text{N}$  was carried out between 18 June and 9 July 1980.

Two parties carried out the 1981 ground censuses: A.R. Lock, D. Mitchell and P. Linegar in northern Labrador, and G. Hansen and S. Young in southern Labrador. Each party travelled in a Zodiac Mk II inflatable boat powered by a 9.9 or 15hp outboard motor, attempting to inspect all islands in its assigned area, and carrying out a careful search and enumeration of all nests on any island on which breeding eiders were found. All nesting areas were searched systematically and thoroughly; as nests were discovered each was marked with a piece of green vegetation to prevent its being recounted. In each area, counts began a week or ten days after the beginning of egg laying and continued until virtually all nests had hatched, at which time it was difficult to find and determine the status of nests.

Each nest discovered was categorized as active or inactive; those in the former category contained eggs, remains of hatched eggs or recently hatched ducklings; all other nests were considered inactive. By mid-July when most of the nests had hatched it was not possible to apply these criteria and colony censuses were suspended.

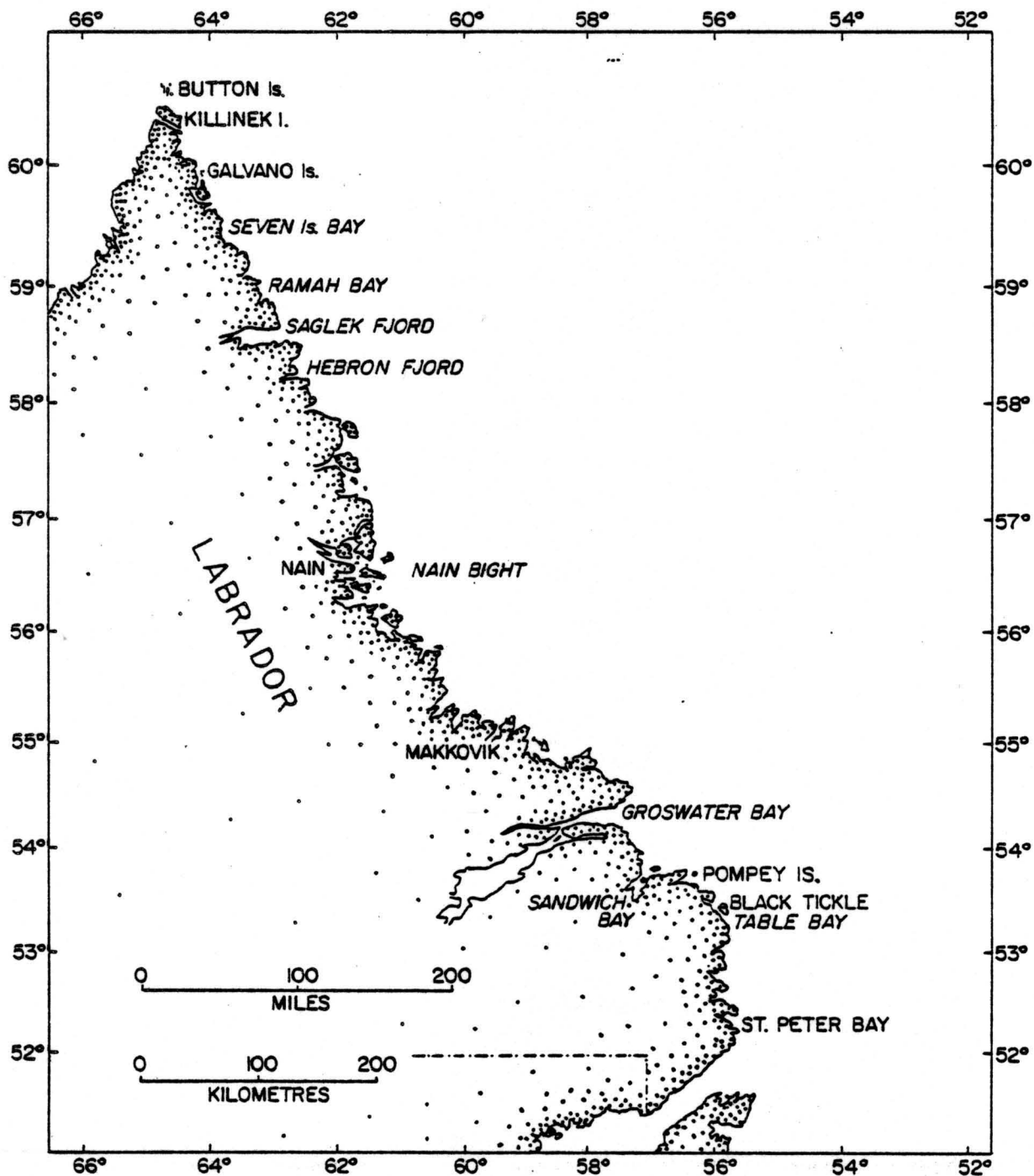


Figure 2. The coast of Labrador.

## RESULTS

Table 1 summarizes the abundance and distribution of all waterfowl counted on the June 1980 aerial survey of the Labrador coast, and Figs. 3 and 4 show the distributions of adult male and "brown" eiders (adult females and immatures of both sexes).

On the approximately 300 km of coastline between the Button Islands and Hebron Fjord, all islands presenting suitable nesting habitat were examined and eiders were found breeding on twenty-four (Table 2 and Figs 5 to 9). Two thousand and twenty-one active nests including fifteen recently destroyed nests in colony No. 2<sub>1</sub> in northern Labrador. <sup>were found</sup>

In southern Labrador, thirty-seven colonies were found in which 2,242 nests were counted. (Table 3 and Fig 10). In five of these colonies, complete nest counts were not performed, either because insufficient time was available to search out all nests in heavily wooded islands or because late in the season down had been blown from some abandoned nest cups making them very difficult to find. In these colonies the census crew made estimates of the total breeding population based on nest numbers and densities in searched portions of the colonies. Where such estimates were made the bracketed entries in Tables 2 and 3 are actual nest counts; the figure standing outside the brackets is an estimate of the total number of breeding pairs in a colony. In the southern census area two small areas which contain possible eider breeding habitat were not searched; these are circled in Fig. 10.

Table 4 compares the numbers of pairs of Common Eiders found to be breeding on six segments of the northern coast with the number of adult males counted on aerial and boat counts in the same areas.

Table 1. Numbers of waterfowl counted on the June 1980 survey of the Labrador coast.

Survey block	Male Elders	Brown Elders	Surf Scoters	W-W. Scoters	Canada Geese	Black Ducks	Goldeneye	Mergansers	Other	TOTAL
51½°-52°N	15	3	978	70	0	135	30	27	20	1278
52°-52½°N	2105	1670	84	212	10	22	62	15	7	4187
52½°-53°N	46	47	64	77	3	0	65	4	0	306
53°-53½°N	200	141	77	18	6	1	57	10	0	510
53½°-54°N	3714	3724	3847	200	42	173	22	18	0	11,740
54°-54½°N	1373	746	673	35	42	1087	0	0	44	4000
54½°-55°N	1312	1193	130	12	83	211	93	2	0	3036
55°-55½°N	938	790	1844	62	107	80	914	24	0	4759
55½°-56°N	512	455	1628	72	114	90	96	30	1	2988
56°-56½°N	1650	1333	7833	496	28	34	1027	75	0	12,476
56½°-57°N	1261	1287	1844	448	32	75	2204	24	17	7192
57°-57½°N	279	203	1476	6021	47	92	414	48	0	8580
57½°-58°N	58	56	0	0	35	49	421	2	0	621
58°-58½°N	146	95	98	51	0	0	148	19	0	557
58½°-59°N	825	941	1400	335	37	0	117	8	0	3663
59°-59½°N	379	899	0	0	26	0	44	8	0	1356
59½°-60°N	247	462	0	0	11	0	83	8	0	811
60°-60½°N	378	641	0	0	107	0	59	13	0	1198
60½°-61°N	5	11	0	0	0	1	0	0	0	17
TOTALS	15,443	14,697	21,976	8,109	730	2,040	5,856	335	89	69,275

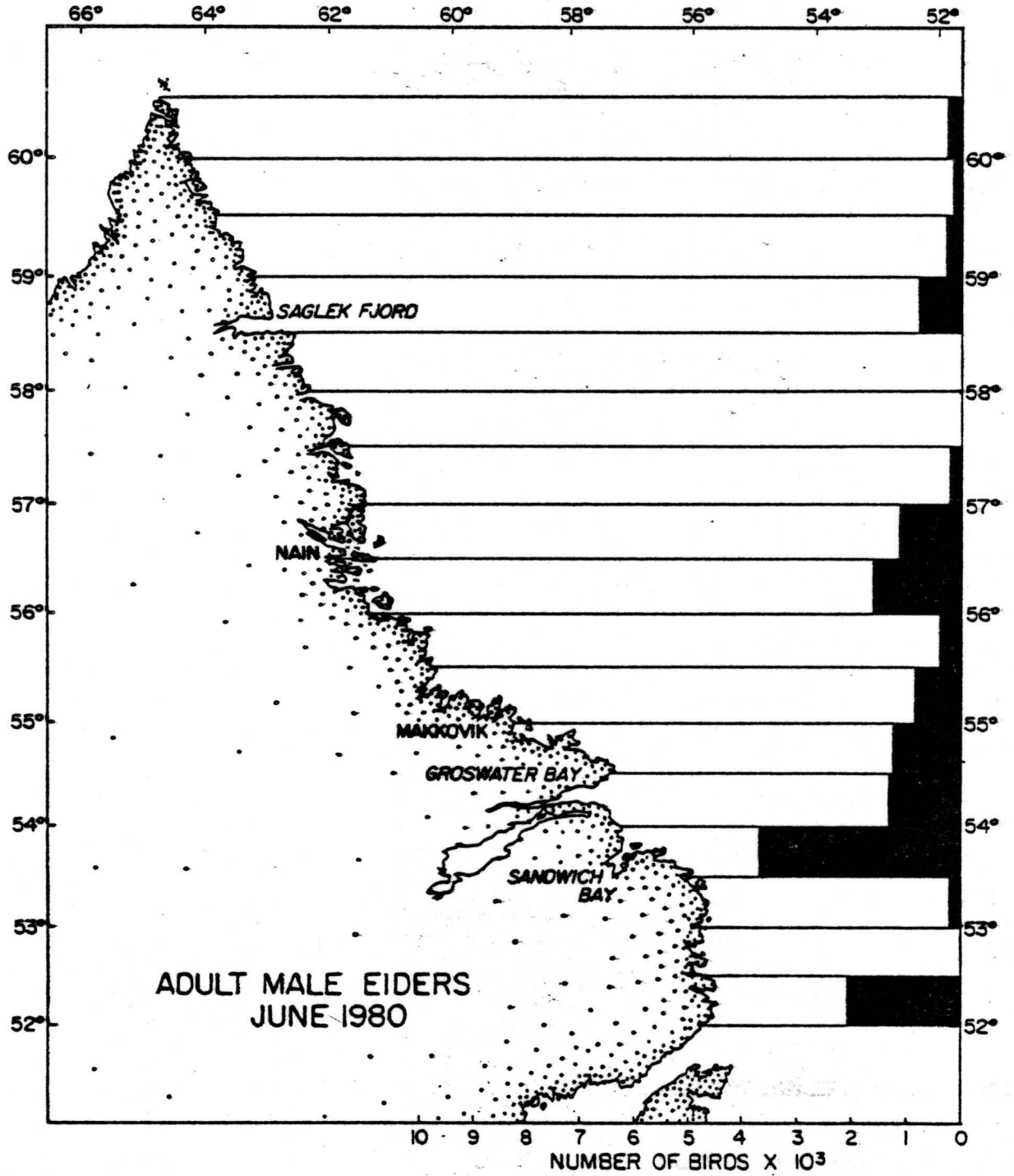


Figure 3. Numbers of adult male Common Eiders counted on the June 1980 aerial survey.

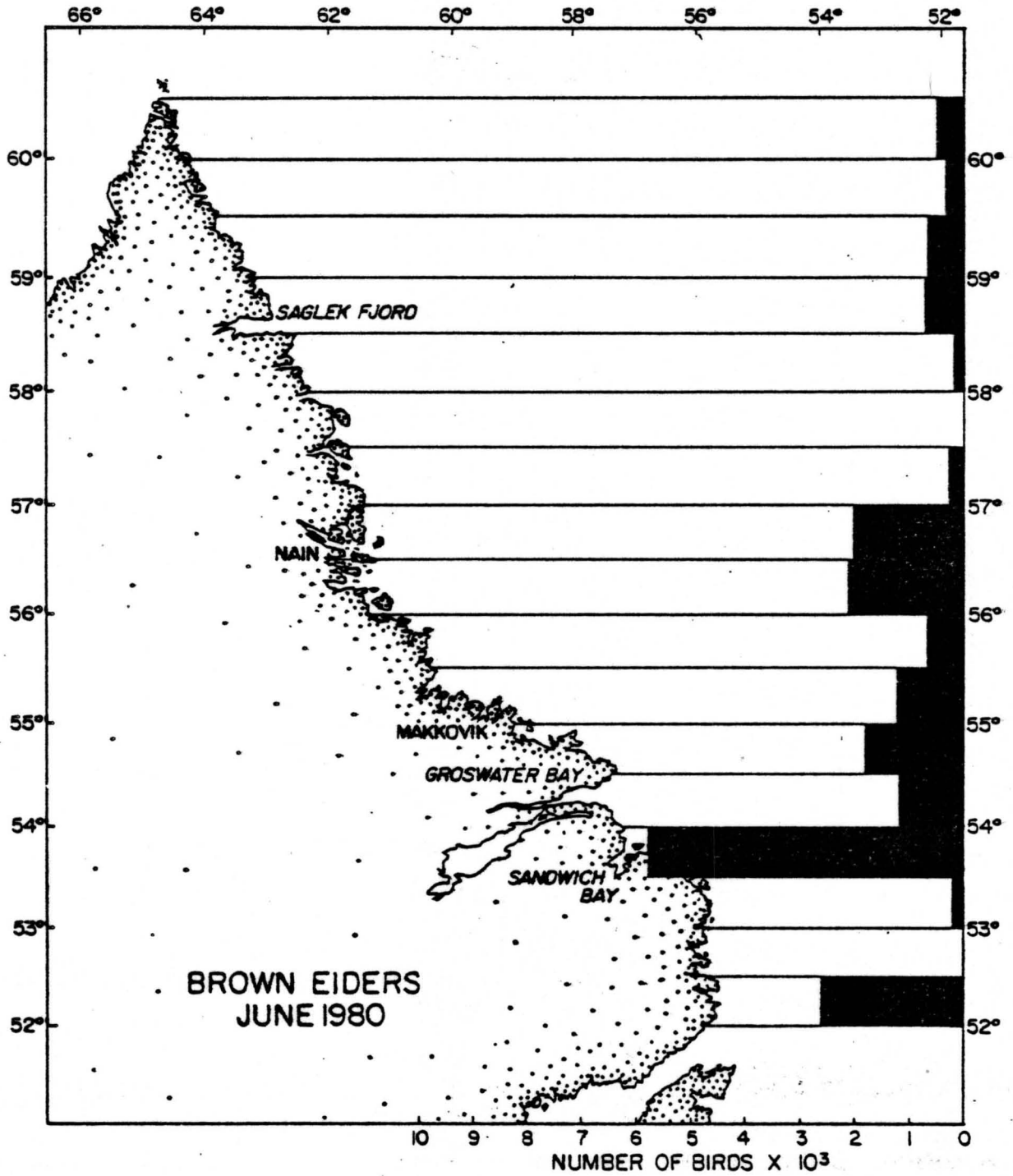


Figure 4. Numbers of "brown" eiders counted on the June 1980 aerial survey.

Table 2: Common Eider colonies in northern Labrador

Colony name or description	No.	Position		Census Date	No. of Breeding Pairs
		Lat	Long		
Austin I.	1	60°17'	64°22'	6 July	14
Second most northerly of the Duck Is.	2	60°14'	64°21'	6 July	16(1)
U. Islet N.W. of Kmock I	3	60°13'	64°21'	6 July	21
U.I. N. of the Hutton Peninsula	4	60°09'	64°17'	6 July	271
U.I.N. of Tait Point	5	60°04'	64°15'	8 July	226
Mikak I	6	60°02'	64°12'	8 July	134
Galvano Is	7	59°57'	63°57'	10 July	64
"	8	59°57'	63°57'	10 July	411
"	9	59°55'	63°58'	11 July	11
"	10	59°55'	63°58'	11 July	99
"	11	59°56'	63°58'	11 July	7
"	12	59°56'	63°58'	11 July	19
"	13	59°56'	63°58'	11 July	50
"	14	59°57'	64°00'	11 July	35
"	15	59°57'	63°57'	10 July	5
"	16	59°57'	63°57'	10 July	17
"	17	59°57'	63°57'	12 July	225
U. Islet N.E. of Kennard I	18	59°26'	63°40'	15 July	128
One of the Hog Is.	19	59°25'	63°40'	15 July	207
One of the Hog Is.	20	59°25'	63°40'	15 July	3
Southernmost of the Bryant Is.	21	59°22'	63°39'	15 July	27
U.I. at the mouth of Ramah Bay	22	58°54'	63°12'	19 July	24
Ukkalek	23	58°18'	62°37'	25 June	3
Dog Is.	24	58°12'	62°37'	22 June	4

Table 3: Common Eider colonies in southern Labrador

Colony name or description	No.	Position		Census Date	No. of Breeding Pairs
		Lat	Long		
Tinker I	25	53°50'	56°35'	19 June	3
North Sister I.	26	53°48'	56°31'	19 June	4
South Sister I.	27	53°48'	56°31'	19 June	6
Islet at the top of Long I.	28	53°48'	56°37'	19 June	4
Flat Is.	29	53°45'	56°20'	8 July	12
U. Islet N. of Star I.	30	53°42'	56°31'	5 July	3
U. Islet N.E. of Star I.	31	53°42'	56°30'	5 July	5
Star I	32	53°41'	56°31'	5 July	1
U.I. 1 Km N.W. of Ledge I.	33	53°42'	56°33'	6 July	13
U.I. 2 Km E. of Suglo Pt.	34	53°43'	56°34'	6 July	675 (361)
U.I. S. of Ledge I.	35	53°40'	56°33'	6 July	225 (120)
U.I. S. of Ledge I.	36	53°40'	56°32'	6 July	26
U.I. 2 Km W. of Quakers Hat	37	53°41'	56°23'	27 June	144
U.I. 2 Km W. of Quakers Hat	38	53°40'	56°23'	29 June	19
Quakers Hat	39	53°39'	56°21'	25 June	209
Entry I.	40	53°42'	56°23'	29 June	138
U. Islet N.W. of Collingham I.	41	53°43'	56°18'	30 June	12
U. Islet N. of Collingham I.	42	53°43'	56°18'	30 June	107
U. Islet N.E. of Collingham I.	43	53°43'	56°18'	30 June	55
U.I. 3 Km S. of Devils Lookout	44	53°37'	56°18'	28 June	50
U.I. 2 Km E. of Cape Greep	45	53°41'	56°09'	20 July	395 (308)
U.I. 3 Km S.E. of Cape Greep	46	53°35'	56°09'	20 July	370 (295)
Eastmost of the Ferret Is.	47	53°41'	55°54'	19 July	40 (20)
Deer I.	48	53°34'	5°55'	20 July	11



Table 3 Continued

Colony name or description	No.	Position		Census Date	No. of Breeding Pairs
		Lat	Long		
U.I. 2 Km S.W. of Deer I.	49	53°33'	55°56'	19 July	5
U.I. 5 Km W. of White I.	50	53°32'	55°58'	18 July	49
White I.	51	53°32'	55°33'	18 July	6
U.I. 1 Km S.W. of White I.	52	53°32'	55°54'	18 July	3
Duck I.	53	53°31'	55°32'	14 July	1
U.I. 3 Km W. of Eagle I.	54	53°28'	56°03'	18 July	98
U. Islet N. of Eagle I.	55	53°29'	55°59'	14 July	34
U.I. N. of Eagle I.	56	53°29'	55°59'	14 July	11
Eagle I.	57	53°28'	56°02'	18 July	4
U. Islet S. of Eagle I.	58	53°28'	55°59'	17 July	17
U.I. 3 Km S. of Eagle I.	59	53°27'	55°59'	18 July	20
U.I. 3 Km S. of Eagle I.	60	53°27'	56°00'	18 July	43
U.I. in Porcupine Bay	61	53°26'	55°59'	17 July	25

TABLE 4: Numbers of active nests of Common Eiders on six segments of the northern Labrador coast compared with the numbers of adult males counted on aerial and boat surveys.

Latitude	No. of active nests	Number of adult males	
		1980 aerial count	1981 boat count
60°30' - 61° N	0	5	15
60° - 60°30' N	682	378	124
59°30' - 60° N	943	247	69
59° - 59°30' N	365	379	105
58°30' - 59° N	24	825	1626
58° - 58°30' N	7	146	109
<b>TOTALS</b>	<b>2021</b>	<b>1980</b>	<b>2048</b>

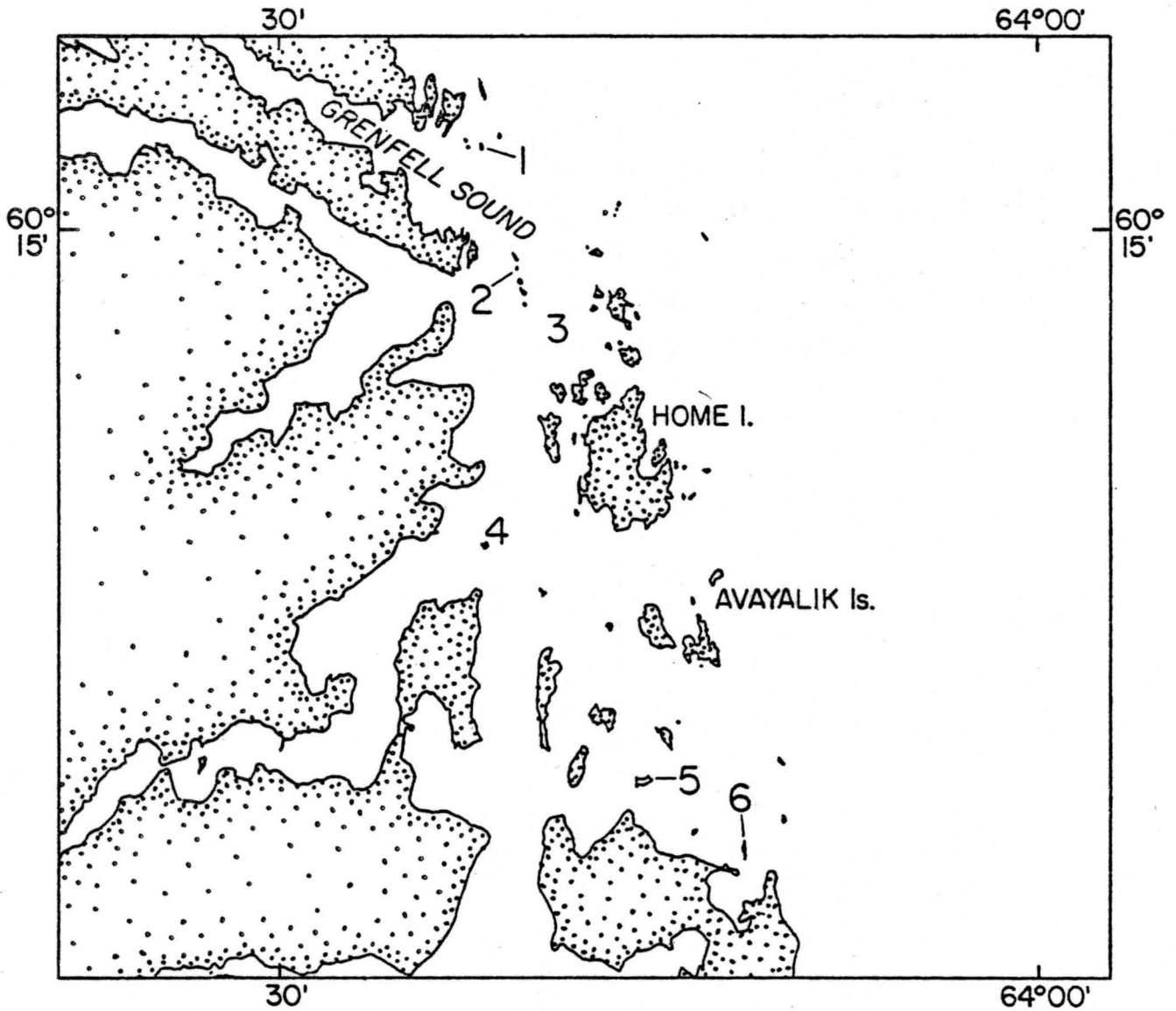


Figure 5. Common Eider colonies to the south of Grenfell Sound.

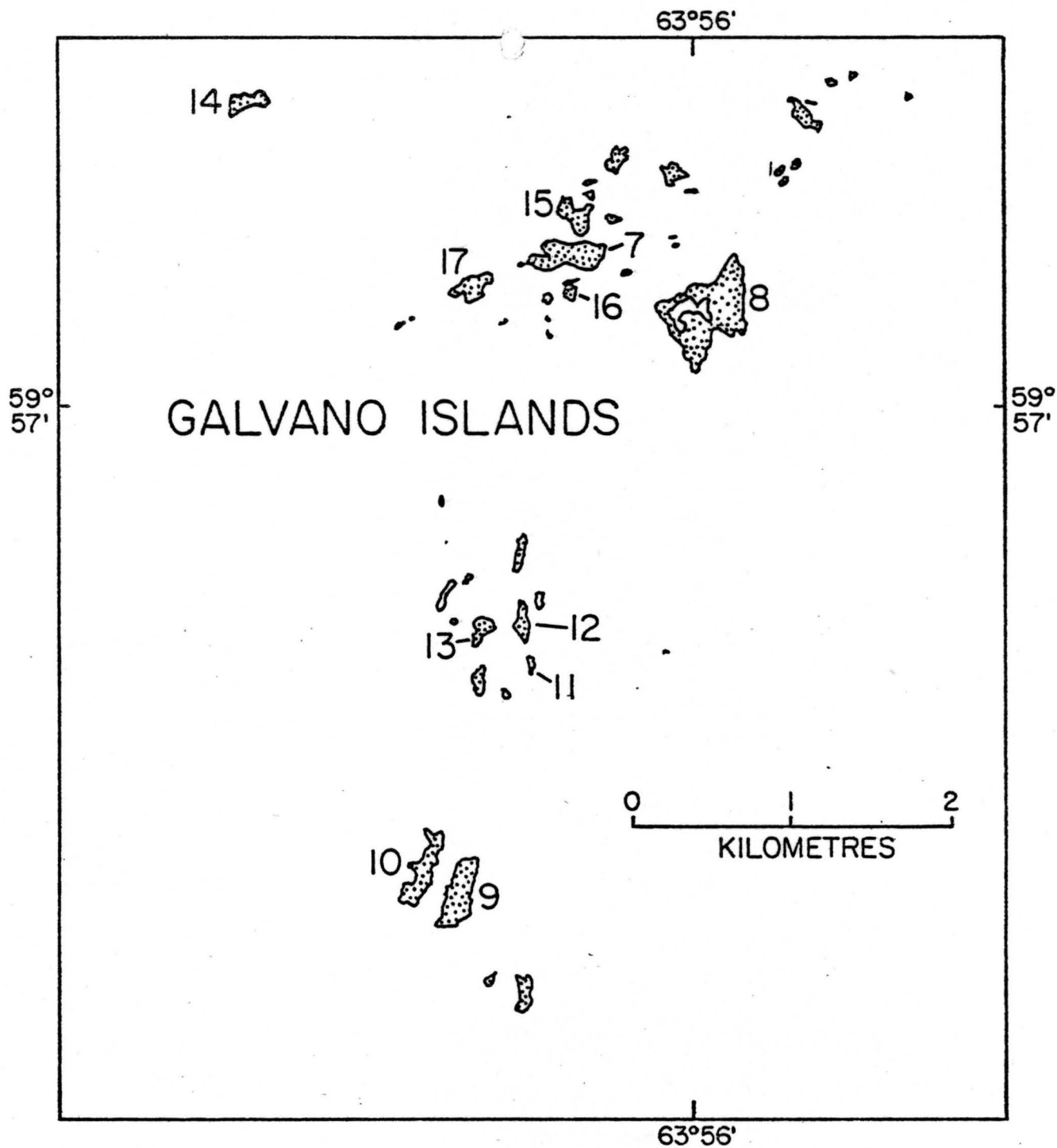


Figure 6. Some of the Galvano Islands showing positions of Common Eider colonies.

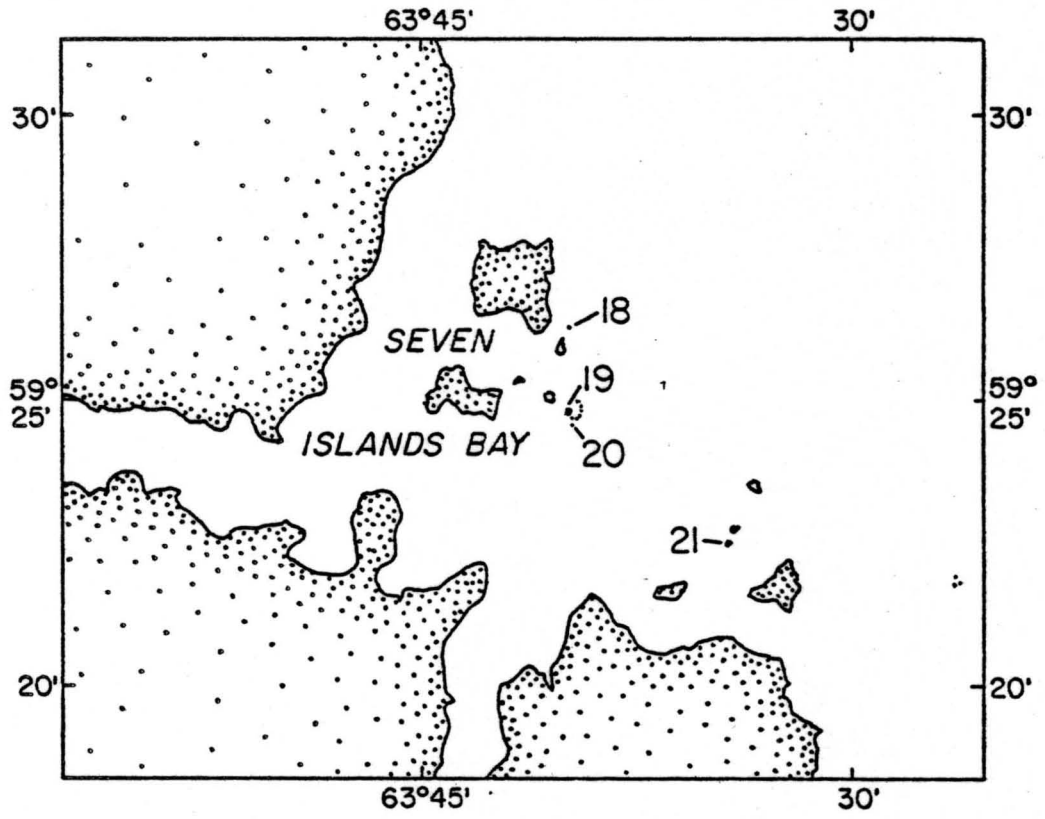


Figure 7. Common Eider colonies in Seven Islands Bay.

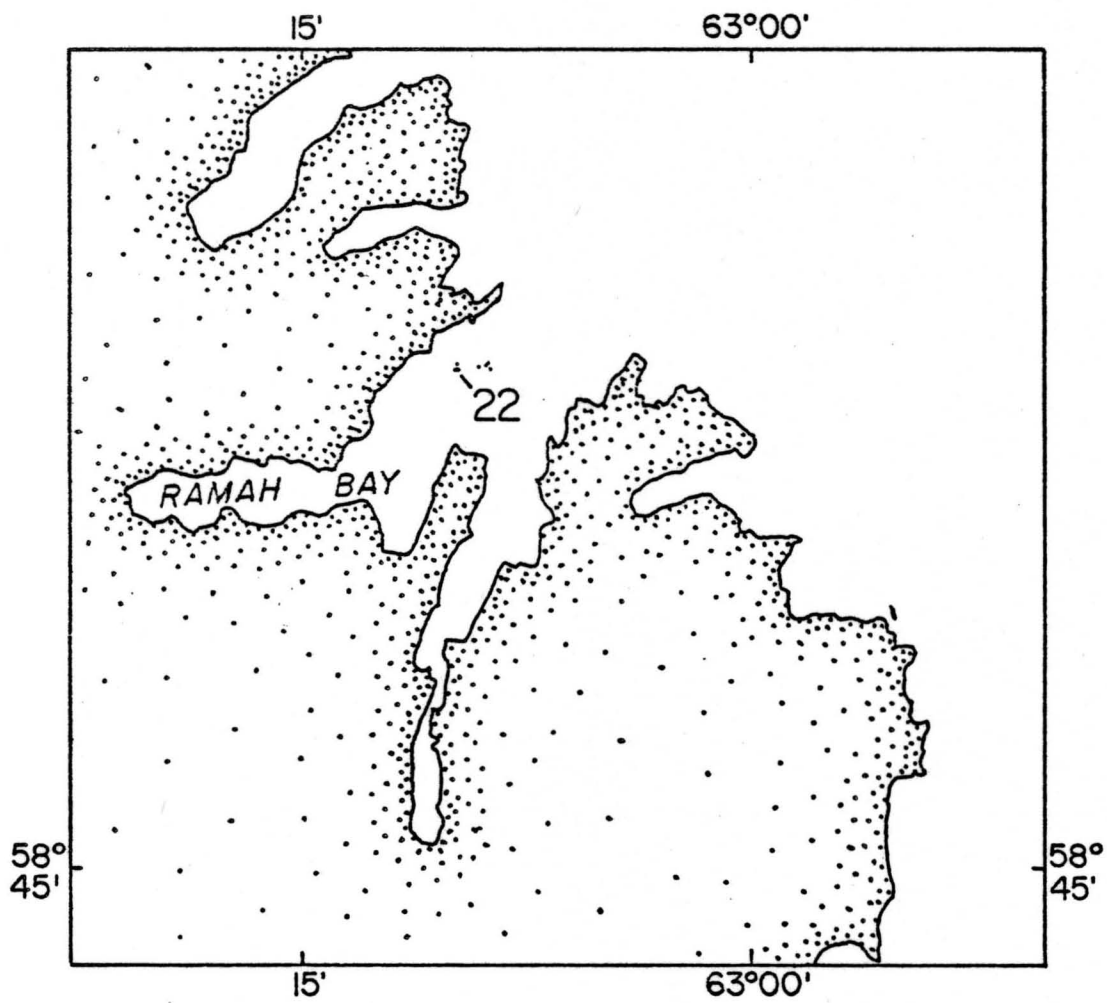


Figure 8. The position of the Ramah Bay Common Eider colony.

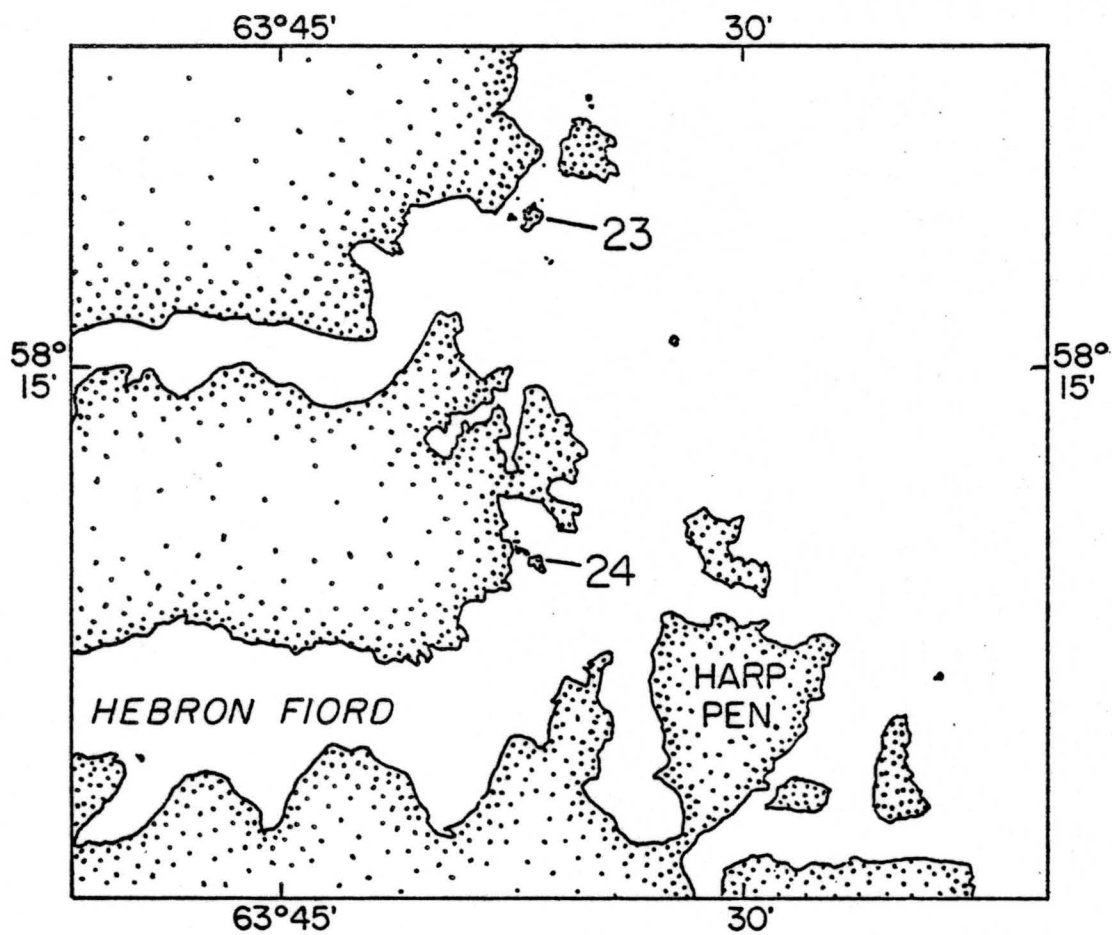


Figure 9. Common Eider colonies near Hebron.

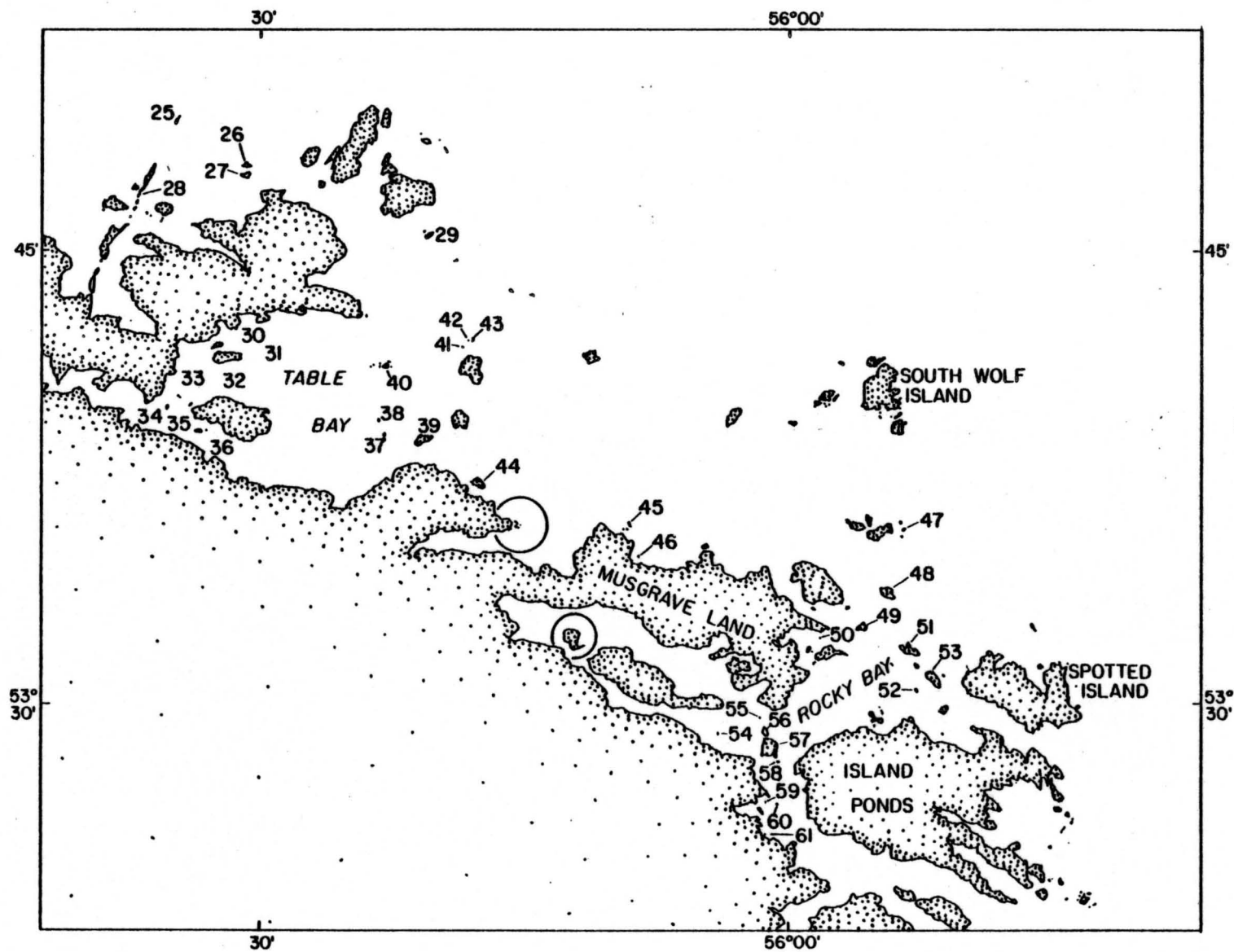


Figure 10. Common Eider colonies near Table Bay.



## DISCUSSION

The aerial survey revealed notable irregularities in the distribution of both adult male and "brown" eiders along the Labrador coast, though the patterns of distribution of each were quite similar. Aerial counts are notoriously unreliable where the sizes of large flocks must be quickly estimated but the numbers of adult male eiders shown in Table 1 and Fig. 3 are counts of individuals in relatively small and well-dispersed flocks. Coverage of the coast was thorough (Fig. 1) and these estimates are thought to be quite exact.

In northern Labrador, the colony censusers kept a running count of the number of adult male eiders seen and these, totalled over half degrees of latitude are presented in Table 4 compared with numbers of active nests and aerial counts of adult males. While the overall totals of breeding pairs and of adult males seen were very close, there was little agreement between counts of adult males and breeding pairs on small segments of coast. The totals of males counted from the water and the air were comparable, but the distributions among the six census blocks were less similar. The boat counts showed a greater concentration in one block (58° 30' N to 59° N) which included a notable eider concentration near the north shore of Saglek Fjord where no eiders breed. In 1980 this area was censused on 8 July but not until 21 July in 1981. The different distributions presumably reflect a movement of males to Saglek Fjord at this time of year, perhaps a moult migration to sheltered waters with abundant food. (Salomonsen 1968)

For the isolated breeding group in northern Labrador the ratio of aerial counted males to breeding pairs was 0.98:1; in southern Labrador, the agreement was, not unexpectedly, less exact, with 3439 adult males

counted but only 2843 breeding pairs estimated: a ratio of 1.21 males per pair. No ground counts of males were made there.

In searches of eider colonies some nests inevitably will be missed; Kadlec and Drury (1968) showed that in gull colonies only about 90% of nests were found on a first search. Furthermore, isolated nests and small groups of nests apart from the main colony may occasionally be missed, and nests predated shortly before the count or second nests in which eggs had not been laid would also remain uncounted. Thus, estimates of numbers of breeding pairs based on a single nest search are somewhat conservative. In the northern census area none of the colonies had tree or shrub cover, and counts there are probably more accurate than those done in the south. In addition, two island groups in the southern census area which may have had breeding eiders were not searched (Fig. 10). Had it been possible to census the southern area more thoroughly, the numbers of males and breeding pairs would likely have been closer.

It is apparent then that carefully executed aerial counts of adult males may allow an adequate estimate of the breeding population of Common Eiders if carried out at the correct time and if the censused area is not too small. The 15,443 adult males counted on the 1980 aerial survey may be taken as a good estimate of the number of pairs breeding on the coast, though the presence of some 1500 birds in St. Peter Bay ( $52^{\circ} 03' N$ ) on 8 June may detract from the exactness of the estimate. It is known that very few birds now breed in this former sanctuary, and it is likely that most birds seen there bred elsewhere. The post-breeding dispersal pattern of males varies with location, depending on the availability of suitable moulting and feeding habitat, and is not known for this region. If the

1,505 males counted in St. Peter Bay are subtracted from the total, we can estimate that close to 14,000 pairs of Common Eiders breed on the Labrador coast at present.

The concentration of breeding eiders in the Groswater Bay and Nain Bight regions parallels the breeding distribution of Labrador Alcids. Over 95% of the Labrador murrelets, Puffins and Razorbills also breed in these same areas (Lock 1979). No investigations of sea bird or eider feeding biology in Labrador have been completed and data on food abundance which might explain the concentrations are not yet available.

The remoteness of the Labrador coast, which over the course of this century attracted many ornithologists, has at the same time hindered systematic and quantitative assessments of the species that breed there. The Common Eider is usually considered "abundant" or "common" in Labrador, but there are no records of accurate colony censuses. However a single series of summer counts made in 1906 may be compared with another series made in the same area under similar conditions 73 years later. Townsend and Allen (1907) travelled from Blanc Sablon (Quebec) to Nain ( $56^{\circ} 32' N$ ) and back on coastal steamers in July 1906. Between 18 and 24 July they carried out the return trip from Rigolet ( $54^{\circ} 11' N$ ) to Nain and they stated that "except when we were eating or sleeping we were always on deck either on the bridge or in the bow, making note of all the birds seen, using constantly strong binoculars, ..." (sic). In their account of "Birds of Labrador" they presented a table giving approximate numbers of birds seen on different parts of the cruise. In 1979, between 6 and 13 July seabird counts were made from the coastal boat "Bonavista" on a return trip between Rigolet and Nain (Maclaren Marex 1980). On this trip 101 standard P.I.R.O.P. (Brown et al.

1975) counts of 10 minutes each were made, covering approximately 340 km of the ships course. In order to make constructive comparisons between these two series of observations, they must be standardized in some way, as by comparing them to counts of a species which was equally abundant at the time of both censuses.

The only species of seabird thought <sup>not</sup> likely to have changed much in numbers between the two surveys is the Black Guillemot (Cephus grylle). It has not benefited from human activities nor is there evidence of a decline in numbers. As a widely dispersed breeder it is likely to be fairly sampled by boat observers, unlike species which gather in large flocks or breed in a few large colonies. Townsend and Allen counted an average of only 0.134 Eiders for each Black Guillemot while the MacLaren Marex observers counted 0.625 Eiders per Guillemot; an increase of 4.7 times. Obviously the validity of this comparison depends on many assumptions: that numbers of Black Guillemots had not changed in the intervening years, that the ships' courses were sufficiently similar, and that both censuses fairly sampled both Eider and Guillemot populations. The assumption of an unchanged Black Guillemot population is supported by the calculation that to have counted 673 Black Guillemots, Townsend and Allen must have counted birds over about 800 km of the ship's course. The return trip was approximately 1500 km, so this is not an unreasonable assumption.

The difference between the counts is sufficiently great that it most likely does indicate a real increase in the breeding Eider population of Labrador. The apparent changes in numbers of other species of marine birds counted by both censuses and compared by this procedure are all

reasonable on the assumption of a general increase in species which formerly were hunted or egged on the Labrador coast.\*

The decrease in persecution and increase in numbers of marine birds in Labrador has resulted partly from a reduced need for wild food in summer as a result of imports of fresh food to the coast. More important is the change in fishing practices in the Labrador near-shore waters; until recent decades the cod fishery was prosecuted from schooners and many small summer fishing stations on coastal islands which relied on eider and alcid colonies for supplies of eggs and meat. Most fish are now taken by larger offshore trawlers and long-liners and marine bird colonies are no longer so heavily exploited.

In the northeastern United States and in the Maritime Provinces, eider populations also had been drastically reduced by the beginning of the twentieth century, and since that time <sup>have</sup> ~~none~~ made a dramatic recovery (Mendall 1968). This is in strong contrast to the Greenland situation (Salomonsen 1967) where populations were healthy until late in the last

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Now geese and ducks and nameless numbers more,

In social flocks are ~~found~~ on every shore

Their eggs we seek, we rove from Isle to Isle,

Eager to find, and bear away the spoil:

These in abudnace every hand picks up,

And when our toil is over, on these we sup.

G. Cartwright (1792)

Labrador: A Poetical Epistle

century but have been gradually declining since then. Apparently the Labrador eider population had not been so drastically reduced in the early years of this century as the populations to the south of it, nor has its growth in this century been so dramatic.

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