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9

The Distribution of Penguin Breeding Colonies on the Australian Antarctic Territory, Heard Island, the McDonald Islands, and Macquarie Island.

R.S.C. Horne

ANTARCTIC DIVISION
DEPARTMENT OF SCIENCE AND TECHNOLOGY

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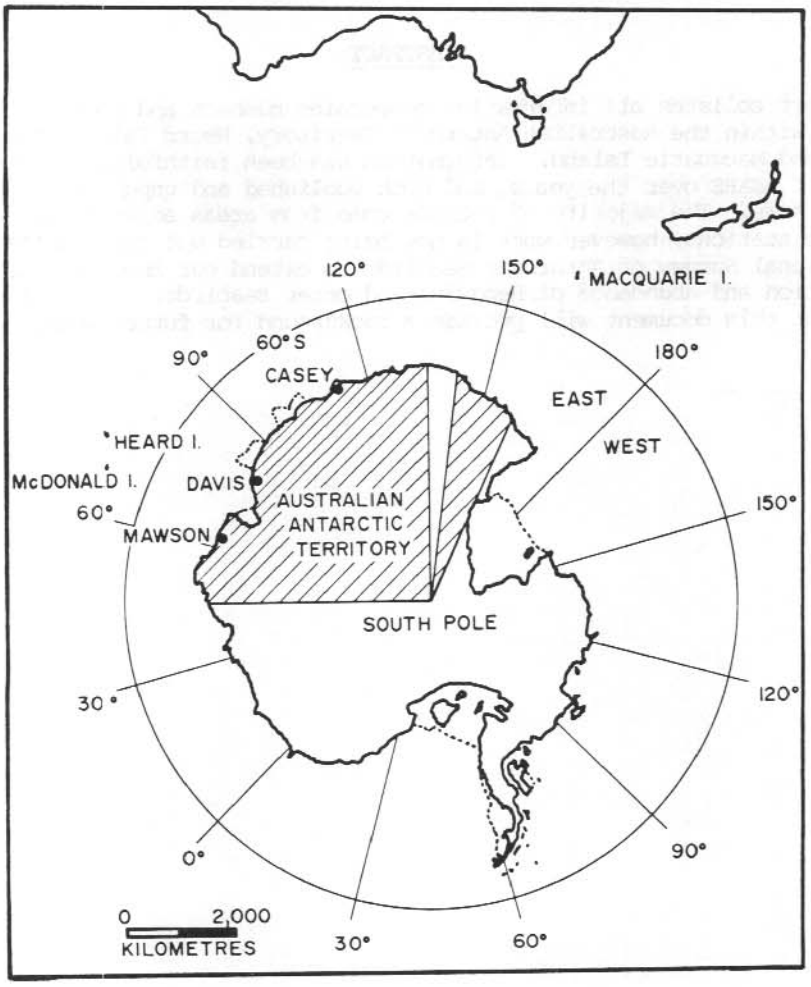
by R.S.C. Horne

Antarctic Division,
Department of Science and Technology,
Hobart, Tasmania, Australia

ABSTRACT

This report collates all information concerning numbers and location of penguin colonies within the Australian Antarctic Territory, Heard Island, the McDonald Islands and Macquarie Island. Information has been faithfully recorded by many members of ANARE over the years, and both published and unpublished data are included here. The majority of records come from areas adjacent to Australia's Antarctic stations, however work is now being carried out through the International Survey of Antarctic Seabirds to extend our knowledge of distribution and abundance of Penguins and other seabirds. It is therefore hoped that this document will provide a background for future work.



Map 1. Australian Antarctic Territory, Heard Island, the McDonald Islands, and Macquarie Island.

1. INTRODUCTION

During recent years the diminishing world supply of protein has focused attention on the virtually untapped resources of Antarctic waters. The Antarctic krill (Euphausia superba), a small shrimp-like crustacean, which abounds in southern waters has become the subject of much controversy. Krill is the major food source for many whales, seals, seabirds, fishes and squid and as such is a vital link in the Southern Ocean food chain. Already many thousands of tonnes are harvested each year by USSR, Japan, East Germany, Poland, South Korea, Taiwan, West Germany, Norway and Chile. The potential food value of krill is enormous but the effects on the environment of over-exploiting this resource could be catastrophic.

In 1976 the Scientific Committee for Antarctic Research (SCAR), recognising the need for precise information regarding the dynamics of the Antarctic marine ecosystem, implemented a multi-national study program - Biological Investigations of Marine Antarctic Systems and Stocks (BIOMASS). The ten year BIOMASS program is designed to study the biology of the Southern Ocean, with particular reference to those factors which influence the abundance and distribution of krill.

Any study of krill biology must include a knowledge of the role that natural predators play. Thus within the scope of BIOMASS an International Survey of Antarctic Seabirds (ISAS) has been implemented to study the requirements of seabirds, which rank with seals and whales as major predators of krill. It is hoped that by monitoring the breeding numbers and reproductive performance of selected seabird species known to prey on krill, any changes in distribution and abundance of krill that may arise from commercial exploitation may be detected.

Penguins were the principal species selected for study as they comprise about 80 per cent of the avian biomass in the Southern Ocean. The Adelie Penguin is the most numerous species in Antarctic regions and Royal/Macaroni Penguins are similarly important in the sub-Antarctic.

At the subcommittee meeting on Bird Biology held in Pretoria, South Africa, in August 1979, it was agreed that ISAS should comprise two principal components: (a) a compilation of all existing published and unpublished information on the distribution and numbers of breeding populations of selected species of seabirds along the coast of Antarctica and on the sub-Antarctic islands; and (b) an upgrading of this information by detailed field surveys aimed primarily at censusing breeding populations of Adelie and Royal/Macaroni Penguins along the coast of Antarctica and on the sub-Antarctic islands.

The overall objective is to produce comprehensive estimates of the total breeding populations of Adelie and the Royal/Macaroni Penguins for all the Antarctic coastline and off-shore islands and for the sub-Antarctic islands, which may be used to derive estimates of the total populations of the species, and the biomass of food they consume.

Australia's contribution to this international survey is presented here. All published and available unpublished data, up until 1980, concerning the distribution and abundance of all penguin species breeding within Australian Antarctic Territory and the sub-Antarctic islands Heard Island, the McDonald Islands and Macquarie Island, all of which are administered by Australia, have been included (Map 1).

2. PRESENTATION OF DATA

The data are presented in the format of Croxall & Kirkwood (1979) as recommended by the Report of the Subcommittee on Bird Biology held in Pretoria.

In the tables all counts are estimates of the number of breeding pairs except where otherwise indicated. The numerical estimates and counts are of three kinds, indicated by the coded N, C or A:

NESTS. (N = count of NESTS or breeding/incubating pairs)
The most accurate count of breeding pairs is that derived from a count of nests. This is usually carried out during incubation, but may also be made while chicks are still in the nest, before creches are formed. Such counts are only underestimates of breeding pairs by the number of breeding failures sustained between egg laying and the date of the count.

CHICKS. (C = count of CHICKS)
Late in the breeding season the only counts possible are those of chicks. In general most pygoscelid penguins raise one chick per pair per season, so a count of chicks gives a reasonable approximation of the original number of breeding pairs. However, season to season variation in breeding success can often be considerable. For example Yeates (1968) reports breeding success in Adelie Penguins at Cape Royds of twenty-six per cent, forty-seven per cent and sixty-eight per cent over three seasons. Also, Macaroni Penguins only raise approximately 0.5 chicks per pair per season, so that chick counts of this species may be a considerable underestimate of the true breeding population.

ADULTS. (A = count of ADULTS)
Many colony counts and estimates were expressed as total number of birds or adults. These figures are difficult to interpret as they depend on the time during the breeding season at which they were made. For some days prior to and until laying is finished, both birds of a pair will be present at the nest site while during incubation it is more likely that only one bird will be present. A further problem with counts of 'birds' is that they may include individuals who are not breeding and this gives an overestimate of the true breeding population. The counts of 'birds' or 'adults' which appear unqualified in log books have been divided by two to give an estimate of the number of breeding pairs. It must be stressed therefore that these counts are the least accurate.

The degree of accuracy of these counts is inevitably highly variable and it is often difficult to ascertain on what basis a figure was arrived at. For the present survey counts have been allocated to one of five degrees of accuracy.

1. Pairs/nests essentially individually counted. The count is probably accurate to better than $\pm$ 5 per cent.
2. Numbers of pairs in a known area counted individually and knowing the total area of the colony, the overall total calculated. This technique is useful for very large colonies.
3. Accurate estimates; $\pm$ 10-15 per cent accuracy.
4. Rough estimate; accurate to 25-50 per cent.
5. Guesstimate; to nearest order of magnitude.

Many references are in the form ANARE (Johnstone) or simply ANARE. These refer to unpublished reports extracted from ANARE station biology logs. Those in the form Budd (1961) refer to published records and are listed in the references at the end of this publication.

The locations of some colonies are indicated on maps. Place names that have not yet been approved are shown in the tables and on the maps in parentheses, for example: (ROOKERY ISLAND).

3. AUSTRALIAN ANTARCTIC TERRITORY

3.1 EMPEROR PENGUIN (Aptenodytes forsteri)

The Emperor Penguin breeds only around the coastline of Antarctica. The first breeding colony discovered within the Australian Antarctic Territory was found at Haswell Island in 1912 during Sir Douglas Mawson's Australasian Antarctic Expedition. Six more breeding colonies were discovered during the 1950's following the establishment of Mawson station in 1954. A full account of the discoveries is reported in Willing (1958). These colonies have been well documented by ANARE personnel in subsequent years. Several other breeding colonies have been recorded, mainly in reports of Soviet expeditions in the vicinity of Mirny.

The colony assembles in early March and laying takes place from early May to early June. Hatching takes place from early July to early August and by early October most chicks have become fairly independent of their parents and are grouped in creches.

The females depart for the feeding grounds immediately after laying and return at the time of hatching two months later, leaving the males to carry out the entire incubation. Mean hatching date, on available data is approximately 20 July (Budd 1962). The first few weeks of brooding are carried out by the female while the male is away feeding, and thereafter the parents alternate until the time of creche formation, after which both may be absent at the same time. Because of this alternation of duties, and because an average of 90% of adults present during incubation and early brooding have eggs or chicks (Budd 1962), the number of adults in the colony at this time may be considered a reasonable estimate of the number of pairs in the breeding population.

KLOA ROOKERY 66°38'S, 57°18'E Map 2

Count	Nature	Date	Reference
5000	A4	25.9.57	ANARE (Clemence)
1600	C2	21.11.59	Budd (1962)
2300	A3	10.4.60	Budd (1962)
5000	A3	1961	ANARE
2173	C2	30.9.75	ANARE (Macey)
1250	A3	17.9.76	ANARE (Larsen)
3050	C1	12.9.77	ANARE (Nash)

FOLD ISLAND 67°18'S, 59°23'E Map 3

Count	Nature	Date	Reference
300-500	A4	12.5.56	ANARE (Lied)
500	A4	18.5.56	ANARE (Seaton)
1000	A4	18-24.5.56	ANARE (Bunt)
>200	A4	31.5.56	ANARE (Seaton)
200	C3	23.9.56	Budd (1962)
50	C4	10.10.56	ANARE (Seaton)
60	C4	27.10.56	ANARE (Seaton)
1250	A3	14.5.57	ANARE
980	A2	14.6.57	ANARE (Willing)
300	A4	13.10.57	ANARE (Willing)
220	C3	13.10.57	ANARE (Willing)
1030	A2	9.6.59	Budd (1962)
290	A3	22.10.59	Budd (1962)
230	C3	22.10.59	Budd (1962)
870	A3	10.8.60	Budd (1962)
820	C3	10.8.60	Budd (1962)
248	A3	9.10.62	ANARE (Wiggs)
563	C3	9.10.62	ANARE (Wiggs)
1010	A2	12.6.69	Moonie (1972)
1150	A2	5.6.71	Moonie (1972)
612	A2	17.8.73	ANARE (Bryant)
402	C1	8.9.73	ANARE (Bryant)
470	C2	10.74	ANARE (Werner)
550	C2	30.9.75	ANARE
516	A3	22.9.76	ANARE (Larsen)
450	C1	16.9.77	ANARE (Nash)

TAYLOR ROOKERY 67°27'S, 60°52'E Map 4

Count	Nature	Date	Reference
2200	C2	21.10.54	ANARE (Dovers)
1800	C2	25.9.55	Budd (1962)
2250	A3	4.5.57	ANARE
2660	A2	12.6.57	ANARE (Willing)
1000	A3	30.10.57	ANARE (Willing)
1870	C3	30.10.57	ANARE (Willing)

Count	Nature	Date	Reference
2000	A3	6.5.58	ANARE
3000	A3	13.5.58	ANARE
2400	A3	6.7.58	ANARE (Brown)
4180	A2	11.6.59	Budd (1962)
1220	A3	20.10.59	Budd (1962)
1200	C3	20.10.59	Budd (1962)
4080	A3	29.5.60	ANARE (Newton)
3390	A3	27.7.60	Budd (1962)
1070	A3	4.10.60	Budd (1962)
840	C3	4.10.60	Budd (1962)
5000	A3	1961	ANARE
3294	A2	20.6.62	ANARE
3800	C3	6.10.62	ANARE
3000	A2	9.68	ANARE
4950	C2	9.68	ANARE
2540	A2	17.6.69	Moonie (1972)
3640	A2	9.6.71	Moonie (1972)
1903	C2	29.9.72	ANARE (Jones)
3444	A2	3.7.73	ANARE (Brophy)
2584	C2	10.10.73	ANARE
4452	A2	7.6.74	ANARE (Luders)
2794	C2	5.10.75	ANARE
1770	C2	20.9.77	ANARE (Nash)
2000	A3	16.8.78	ANARE (Chester)
3000	A3	15.8.79	ANARE (Reynolds)
1800	A3	11.8.80	ANARE (Kirkby)

AUSTER ROOKERY 67°23'S, 64°02'E Map 5

Count	Nature	Date	Reference
11000	A2	7.8.57	ANARE
12000	A3	21.8.57	ANARE (Willing)
11500	A3	9.5.58	ANARE (Brown)
10500	A3	30.5.58	ANARE (McLeod)
18000	A2	6.7.59	Budd (1962)
3960	A3	30.10.59	Budd (1962)
5220	C3	30.10.59	Budd (1962)
12000	A2	2.6.60	Budd (1962)
3500	A2	3.11.60	Budd (1962)
6500	C2	3.11.60	Budd (1962)
12000	A3	1961	ANARE
15000	A3	28.8.65	Cameron (1969)
13000	A2	8.68	ANARE
10000	A3	12.6.72	ANARE
18258	A2	25.7.74	ANARE
18300	C2	8.74	ANARE (Luders)
10-12000	A3	17.7.78	ANARE (Chester)

FLUTTER ROOKERY, CAPE DARNLEY 67°50'S, 69°45'E

Count	Nature	Date	Reference
5000	A4	16.8.58	Willing (1958)
5000	A3	1961	ANARE

SANDEFJORD BAY 69°40'S, 73°20'E

Count	Nature	Date	Reference
200	C2	26.1.68	ANARE (Collins)

AMANDA ROOKERY 69°16'S, 76°50'E

Count	Nature	Date	Reference
5000	A4	1956-57	Korotkevich (1964)
3000	A4	1957	ANARE
1500	A3	26.8.57	ANARE (Fisher)
3000	A3	1959-60	Budd (1961)
2000	A3	20.5.60	ANARE
1500	A3	1961	ANARE

WEST ICE SHELF (PENGUIN ISLAND) 65°40'S, 82°00'E

Count	Nature	Date	Reference
7500	A3	1956-57	Korotkevich (1964)

(KARELIN BAY) 66°30'S, 85°30'E

Count	Nature	Date	Reference
1000	A3	1.8.58	Korotkevich (1962)

GAUSSBERG 66°13'S, 89°35'E

Count	Nature	Date	Reference
4000	A4	5.10.02	Korotkevich (1962)

HASWELL ISLAND 66°13'S, 89°35'E

Count	Nature	Date	Reference
7000	C3	25.11.12	Falla (1937)
10000	A3	1956-57	Korotkevich (1958)
6-7000	A3	4.58	Makushok (1959)
7000	A3	1959-60	Budd (1961)
10000	A3	1960	Korotkevich (1962)
Large groups	A5	3.61	Korotkevich (1962)
9000	A3	1962	Pryor (1964)
8500	A3	1966	Kamenev (1967)
9000	A3	1962	Pryor (1964)
8500	A3	1966	Kamenev (1967)

POBEDA ICEBERG 64°40'S, 98°30'E

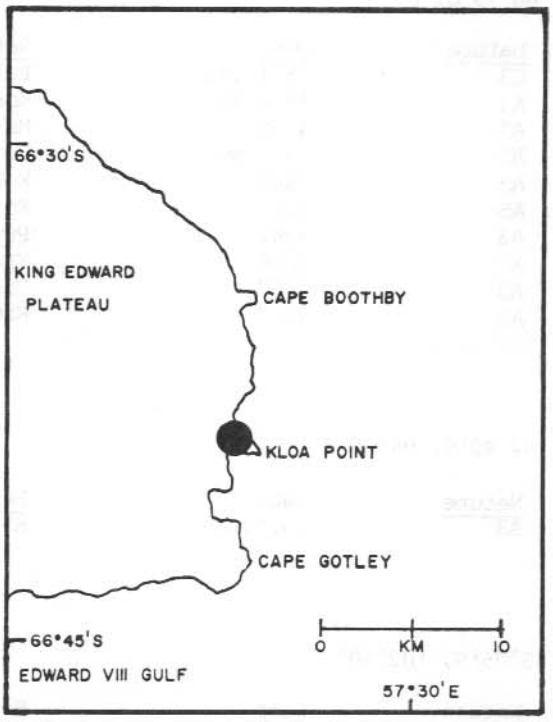
Count	Nature	Date	Reference
10000	A3	26.10.60	Korotkevich (1962)

BOWMAN ISLAND 65°05'S, 102°50'E

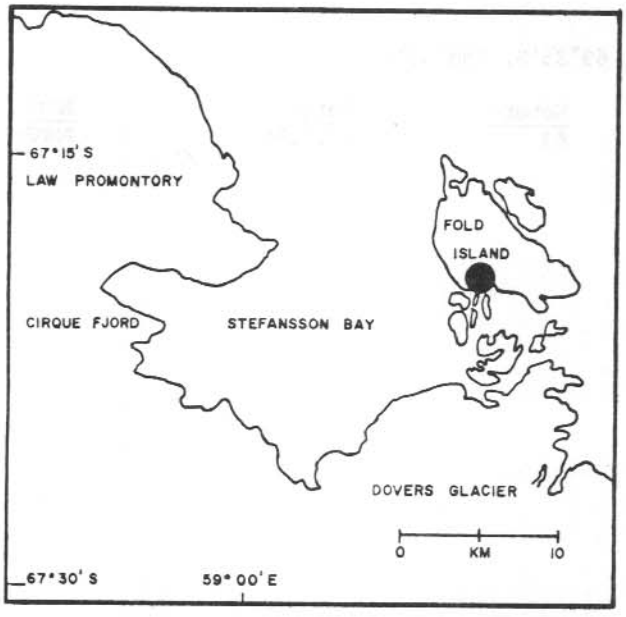
Count	Nature	Date	Reference
3000	A3	26.10.60	Korotkevich (1962)

WILSON HILLS 69°35'S, 158°30'E

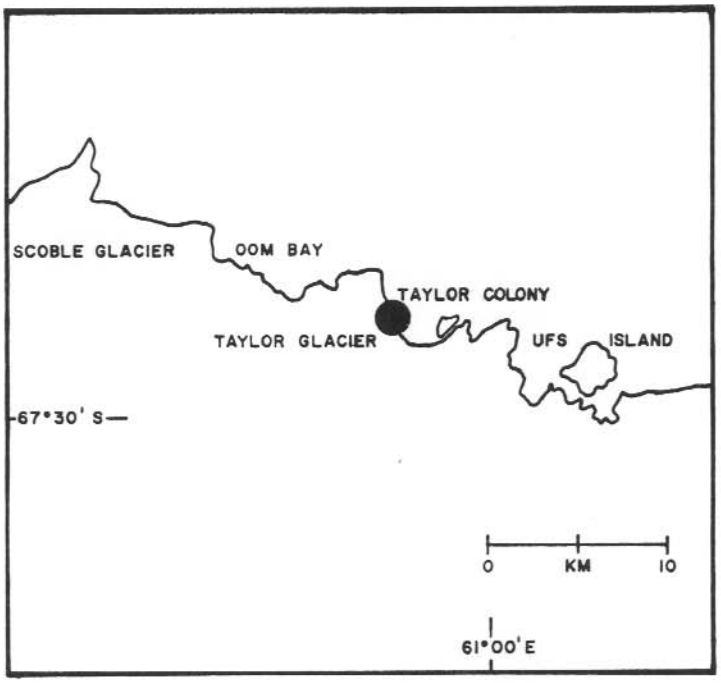
Count	Nature	Date	Reference
90	A4	21.2.59	ANARE (Dingle)



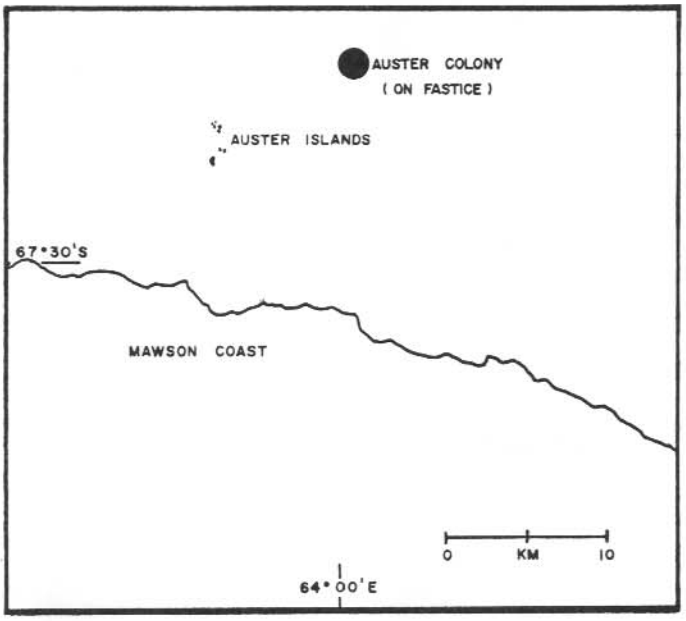
Map 2. Kloa Rookery Emperor Penguin colony.



Map 3. Fold Island Emperor Penguin colony.



Map 4. Taylor Rookery Emperor Penguin colony.



Map 5. Auster Rookery Emperor Penguin colony.

3.2 ADELIE PENGUIN (Pygoscelis adelie)

The Adelie Penguin nests circumpolarly on the coasts of the Antarctic continent and on rocky islands south of 60° South latitude.

The Adelie arrives at its breeding grounds from mid October to early November. Egg laying and incubation commence the second week in November. Two eggs are laid, an average of three days apart and incubation time averages 35 days (Penney 1968). The period of guarding and food collecting begins during the last two weeks of December and continues into the second week of January. Creches are then formed and these continue until the end of February. The colonies disperse at the beginning of March.

The best counts of Adelie breeding population are obtained during the incubation period while only one adult of the pair is at the colony. Some non-breeding adults will however be present at this time.

The colonies are listed by area in the following order.

Molodezhnaya area

Mawson Coast

Rookery Islands

Mawson area

Lars Christensen Coast

Rauer Islands

Davis area

Gaussberg

Haswell Islands

Casey area

Sabrina Coast

Wilkes Coast

Commonwealth Bay

Oates Land Coast

MYALL ISLANDS 67°40'S, 45°45'E (Molodezhnaya area)

Count	Nature	Date	Reference
Few Hundred	A5	-	S.A.E. unpub.

McMAHON ISLAND 67°39'S, 45°59'E (Molodezhnaya area)

Count	Nature	Date	Reference
Few Hundred	A5	-	S.A.E. unpub.

VECHERNYY HILL 67°39'S, 46°06'E (Molodezhnaya area)

Count	Nature	Date	Reference
968	N1	15.12.72	Ditrich (1979)

UFS ISLAND 67°28'S, 61°08'E Map 6 (Mawson Coast area)

Count	Nature	Date	Reference
850	A3	10.2.72	ANARE (Jones)

LOW TONGUE 67°33'S, 62°00'E (Mawson Coast area)

Count	Nature	Date	Reference
Large colony	A3	10.2.72	ANARE (Jones)

OLDHAM ISLAND 67°31'S, 61°43'E (Mawson Coast area)

Count	Nature	Date	Reference
Colony observed from air		10.2.72	ANARE (Jones)

FORBES GLACIER 67°36'S, 62°20'E Map 7 (Rookery Islands)

Count	Nature	Date	Reference
850	A3	10.2.72	ANARE (Jones)
213	C1	11.2.72	ANARE (Kerry)

GIBBNEY ISLAND 67°33'S, 62°19'E Map 7 (Rookery Islands)

Count	Nature	Date	Reference
Large colonies		18.2.72	ANARE (Jones)

GIGANTEUS ISLAND 67°35'S, 62°30'E Map 8 (Rookery Islands)

Count	Nature	Date	Reference
4850	C2	30.12.71	ANARE (Kerry)
7080	A3	17.11.72	ANARE (Jones)

(ROOKERY ISLAND) Map 8 (Rookery Islands)

Count	Nature	Date	Reference
12500	A4	4.11.54	ANARE (Dingle)
15020	A3	17.11.72	ANARE (Jones)

(ISLAND 2) Map 8 (Rookery Islands)

Count	Nature	Date	Reference
4765	A3	17.11.72	ANARE (Jones)

(ISLAND 5) Map 8 (Rookery Islands)

Count	Nature	Date	Reference
807	A3	17.11.72	ANARE (Jones)

(ISLAND 6) Map 8 (Rookery Islands)

Count	Nature	Date	Reference
2934	A3	17.11.72	ANARE (Jones)

(ISLAND 7) Map 8 (Rookery Islands)

Count	Nature	Date	Reference
1492	A3	17.11.72	ANARE (Jones)

(ISLAND 8) Map 8 (Rookery Islands)

Count	Nature	Date	Reference
698	A3	17.11.72	ANARE (Jones)

(ISLAND 9) Map 8 (Rookery Islands)

Count	Nature	Date	Reference
2031	A3	17.11.72	ANARE (Jones)

(ISLAND 10) Map 8 (Rookery Islands)

Count	Nature	Date	Reference
223	A3	17.11.72	ANARE (Jones)

(ISLAND 11) Map 8 (Rookery Islands)

Count	Nature	Date	Reference
326	A3	17.11.72	ANARE (Jones)

Colonies on three islands (3, 4, 12) have not been visited. These are marked with crosses on Map 8.

BECHERVAISE ISLAND 67°35'S, 62°50'E Map 10 (Mawson area)

Count	Nature	Date	Reference
200	A4	3.11.55	ANARE
550	A2	3.1.72	ANARE (Jones)
369	C1	10.2.72	ANARE (Jones)
744	A1	8.12.72	ANARE (Jones)

VERNER ISLAND 67°35'S, 62°53'E Map 11 (Mawson area)

Count	Nature	Date	Reference
1850	A2	3.1.72	ANARE (Jones)
1966	A1	8.12.72	ANARE (Jones)

PETERSEN ISLAND 67°35'S, 62°54'E Map 11 (Mawson area)

Count	Nature	Date	Reference
643	A2	3.1.72	ANARE (Jones)
500	A1	9.12.72	ANARE (Jones)

WELCH ISLAND 67°34'S, 62°56'E Map 12 (Mawson area)

Count	Nature	Date	Reference
2000	A3	8.11.55	ANARE
3000	A3	2.1.72	ANARE (Kerry)
9445	A2	8.12.72	ANARE (Jones)
1000	A3	27.10.77	ANARE

KLUNG ISLAND 67°33'S, 62°59'E Map 13 (Mawson area)

Count	Nature	Date	Reference
4419	A2	8.12.72	ANARE (Jones)

(MACEY ISLAND) 67°24'S, 65°49'E (Lars Christensen Coast area)

Count	Nature	Date	Reference
434	C1	11.2.72	ANARE (Jones)

SCULLIN MONOLITH 67°48'S, 66°42'E Map 14 (Lars Christensen Coast area)

Count	Nature	Date	Reference
100000	A4	13.2.31	BANZARE
100000	A4	15.2.72	ANARE (Jones)

MURRAY MONOLITH 67°47'S, 66°54'E Map 14 (Lars Christensen Coast area)

Count	Nature	Date	Reference
100000	A4	13.2.31	BANZARE
extensive	A5	15.2.72	ANARE (Jones)

(TONGHOLMANE ISLAND) 68°46'S, 77°50'E Map 15 (Rauer Islands)

Count	Nature	Date	Reference
1000	A3	2.3.74	ANARE (Williams)

(STRELKA ISLAND) Map 15 (Rauer Islands)

Count	Nature	Date	Reference
800	N2	2.3.74	ANARE (Williams)

MULE ISLAND 68°39'S, 77°49'E Map 17 (Davis area)

Count	Nature	Date	Reference
250	A3	7.12.63	ANARE (Lugg)
3000	A4	4.11.76	ANARE (Watt)

HAWKER ISLAND 68°38'S, 77°51'E Map 17 (Davis area)

Count	Nature	Date	Reference
2500-7500	A3	1963	Johnstone (1973)
6000	A4	20.11.69	ANARE
2500	A4	27.12.70	ANARE (Westbrook)
2500	A4	27.10.75	ANARE
3500	A4	4.11.76	ANARE (Watt)

GARDNER ISLAND 68°35'S, 77°52'E Map 18 (Davis area)

Count	Nature	Date	Reference
125	A3	16.10.60	ANARE (Stabbey)
4000	A3	31.10.60	ANARE (Stabbey)
1000	A4	28.2.61	ANARE (Brown)
7500	A4	29.10.61	ANARE (Hay)
Thousands	A5	8.11.62	ANARE (Bradley)
7000	A2	14.11.63	ANARE (Lugg)
5000	A4	1.12.69	ANARE
2000	A4	22.10.70	ANARE (Williams)
5500	A4	22.11.70	ANARE (Westwood)
6500	C4	Jan-Feb 72	ANARE
Thousands	A5	19.10.72	ANARE

ZOLOTOV ISLAND and KAZAK ISLAND 68°40'S, 77°51'E Map 19 (Davis area)

Count	Nature	Date	Reference
5500	A3	7.12.63	ANARE (Lugg)

UNNAMED ISLAND WEST OF REDFEARN ISLAND 68°37'S, 77°52'E Map 20 (Davis area)

Count	Nature	Date	Reference
7500	A4	29.10.61	ANARE (Hay)
2500–7500	A3	1963	Johnstone (1973)
6500	A3	17.12.63	ANARE (Lugg)
500	A4	31.10.76	ANARE (Kath)

WARRINER ISLAND 68°37'S, 77°54'E Map 20 (Davis area)

Count	Nature	Date	Reference
7500	A4	29.10.61	ANARE (Hay)
>7500	A3	1963	Johnstone (1973)
10000	A4	15.11.70	ANARE (Westwood)

TURNER ISLAND 68°33'S, 77°53'E Map 21 (Davis area)

Count	Nature	Date	Reference
10000	A4	29.10.61	ANARE (Hay)
>7500	A3	1963	Johnstone (1973)
8500	A4	16.11.63	ANARE (Lugg)
5000	A4	6.12.70	ANARE (Westwood)
4000	A4	Jan–Feb 72	ANARE
160	A4	12.10.74	ANARE (Williams)
3500	A4	9.11.75	ANARE
7000	A4	9.11.76	ANARE (Watt)
150	A4	19.10.75	ANARE
2500	A4	31.10.76	ANARE (Kath)

MAGNETIC ISLAND 68°32'40"S, 77°54'27"E Map 21 (Davis area)

Count	Nature	Date	Reference
6000	C4	30–31.1.55	ANARE (Oldham)
9000	A4	29.10.61	ANARE (Hay)
hundreds	A5	11.11.62	ANARE (Bradley)
>7500	A3	1963	Johnstone (1973)
5000	A3	16.11.63	ANARE (Lugg)
5000	A4	6.12.70	ANARE (Westwood)
6000	A4	Jan–Feb 72	ANARE
200	A4	12.10.74	ANARE (Williams)
4000	A4	9.11.76	ANARE (Watt)

LUGG ISLAND 68°32'S, 77°57'E Map 21 (Davis area)

Count	Nature	Date	Reference
5000	A4	10.61	ANARE (Hay)
>7500	A3	1963	Johnstone (1973)
6000	A3	16.11.63	ANARE (Lugg)

LUCAS ISLAND 68°30'S, 77°58'E Map 22 (Davis area)

Count	Nature	Date	Reference
5000	A4	10.61	ANARE (Hay)
>7500	A3	1963	Johnstone (1973)

ROOKERY LAKE Map 23 (Davis area)

Count	Nature	Date	Reference
20000	A4	17.10.61	ANARE (Hay)
4 colonies each <2500	A3	1963	Johnstone (1973)
2 colonies each 2500-7500	A3	1963	Johnstone (1973)

AREA NORTH EAST OF ROOKERY LAKE Map 23 (Davis area)

Count	Nature	Date	Reference
2500	A4	17.10.61	ANARE (Hay)
>7500	A3	1963	Johnstone (1973)
1500	A4	17.10.61	ANARE (Hay)
<2500	A3	1963	Johnstone (1973)
4500	A4	17.10.61	ANARE (Hay)

ALBINO ROOKERY Map 24 (Davis area)

Count	Nature	Date	Reference
25000	A4	17.10.61	ANARE (Hay)
>7500	A3	1963	Johnstone (1973)

AREA NORTH EAST OF ALBINO ROOKERY Map 24 (Davis area)

Count	Nature	Date	Reference
3500	A4	17.10.61	ANARE (Hay)
<2500	A3	1963	Johnstone (1973)

UNNAMED ISLAND OFF LONG PENINSULA 68°29'S, 78°19'E Map 25 (Davis area)

Count	Nature	Date	Reference
5000+	A4	17.10.61	ANARE (Hay)
2500-7500	A3	1963	Johnstone (1973)

TRYNE ISLAND 68°27'S, 78°23'E Map 26 (Davis area)

Count	Nature	Date	Reference
175	A3	14.10.60	ANARE (Barrett)
15000+	A4	22.10.60	ANARE (Hay)
>7500	A3	1963	Johnstone (1973)

(ISLAND A) 68°25'S, 78°25'E Map 26 (Davis area)

Count	Nature	Date	Reference
2000	A4	22.10.61	ANARE (Hay)
2500-7500	A3	1963	Johnstone (1973)

(ISLAND B) 68°25'S, 78°25'E Map 26 (Davis area)

Count	Nature	Date	Reference
2000	A4	22.10.61	ANARE (Hay)
2500-7500	A3	1963	Johnstone (1973)

WYATT EARP ISLANDS 68°22'S, 78°33'E Map 27 (Davis area)

Count	Nature	Date	Reference
7500+	A4	23.10.61	ANARE (Hay)
3 colonies each 2500	A3	1963	Johnstone (1973)

GAUSSBERG 66°48'S, 89°12'E

Count	Nature	Date	Reference
7500	A4	1956-57	Korotkevich (1964)

(STROITELEY ISLAND) 66°33'S, 92°58'E Map 28 (Haswell Islands)

Count	Nature	Date	Reference
228	N1	11.62	Pryor (1968)
80	A3	1966-67	Kamenev (1970)

HASWELL ISLAND 66°31'S, 93°00E (Haswell Islands)

Count	Nature	Date	Reference
5000	A4	11.12	Falla (1937)
7000	A4	1956-57	Korotkevich (1964)
17500	A4	1962-63	Pryor (1964)
1000	A4	1956	Pryor (1968)
7500	A4	1958	Pryor (1968)
9000	A4	1962	Pryor (1968)

(TOKAREV ISLAND) 66°32'S, 92°59'E Map 29 (Haswell Islands)

Count	Nature	Date	Reference
5280	N2	11.62	Pryor (1968)

BUROMSKIY ISLAND 66°32'S, 93°00'E Map 29 (Haswell Islands)

Count	Nature	Date	Reference
298	N1	11.62	Pryor (1968)

ZYKOV ISLAND 66°32'S, 93°01'E Map 29 (Haswell Islands)

Count	Nature	Date	Reference
1720	N1	11.62	Pryor (1968)

FULMAR ISLAND 66°32'S, 93°01'E Map 29 (Haswell Islands)

Count	Nature	Date	Reference
1860	N1	11.62	Pryor (1968)
20500	N1	11.66	Kamenev (1970)

MIRNY REGION 66°33'S, 93°01'E (Haswell Islands)

Count	Nature	Date	Reference
10000	A4	1956-57	Korotkevich (1964)

DAVIS ISLANDS 66°39'S, 108°24'E (Haswell Islands)

Count	Nature	Date	Reference
550	C4	20-21.2.60	ANARE (Dingle)

NELLY ISLAND 66°12'S, 110°11'E Map 31 (Casey area)

Count	Nature	Date	Reference
250	A4	23.1.56	ANARE (Bunter)
100	N3	1961	ANARE
250	A3	1.2.74	ANARE
68	A2	14.2.80	ANARE (Kerry)

HOLLIN ISLAND 66°19'S, 110°24'E Map 32 (Casey area)

Count	Nature	Date	Reference
300	N3	1961	Orton (1963)
2500	N4	17.12.72	ANARE
1289	A2	23.1.80	ANARE (Kerry)

MIDGLEY ISLAND 66°20'S, 110°24'E Map 33 (Casey area)

Count	Nature	Date	Reference
4200	N3	1961	Orton (1963)
4500	A4	2.12.61	ANARE (Orton)
7500	N4	17.12.72	ANARE
2022	A3	23.1.80	ANARE (Kerry)

HOLL ISLAND 66°25'S, 110°25'E Map 34 (Casey area)

Count	Nature	Date	Reference
3000	N3	1961	Orton (1963)
11000	N3	1972	ANARE (Luders)

CHAPPEL ISLAND 66°11'S, 110°26'E Map 35 (Casey area)

Count	Nature	Date	Reference
1200	N3	1961	Orton (1963)
8000	N3	1972	ANARE (Luders)
2618	A2	14.2.80	ANARE (Kerry)

O'CONNOR ISLAND 66°25'S, 110°28'E Map 36 (Casey area)

Count	Nature	Date	Reference
2000	N3	1961	Orton (1963)
5000	N3	1972	ANARE (Luders)

BEALL ISLAND 66°18'S, 110°29'E Map 37 (Casey area)

Count	Nature	Date	Reference
2800	N2	1961	ANARE (Orton)
4349	N1	1.12.68	ANARE (Mackenzie)
4000	N3	1972	ANARE (Luders)
6510	N3	31.12.72	ANARE

SHIRLEY ISLAND 66°17'S, 110°30'E Map 38 (Casey area)

Count	Nature	Date	Reference
3000	N2	1961	ANARE (Orton)
7344	N1	1.12.68	ANARE (Mackenzie)
7580	N1	7.2.71	ANARE (Ackerly)
8410	N3	1972	ANARE (Luders)
9687	C1	26.1.72	ANARE (Cantellow)
4336	C1	27.1.72	ANARE (Murray)
8534	N1	10.11.72	ANARE (Cantellow)
8012	N1	10.11.73	ANARE
7303	N1	18.11.74	ANARE
7362	A1	26-28.11.76	ANARE (Tyrell)
7049	N1	1.12.77	ANARE (Cowan)

WHITNEY POINT 66°15'S, 110°32'E Map 39 (Casey area)

Count	Nature	Date	Reference
4800	N2	1961	Orton (1963)
1000	A4	27.10.61	ANARE (Orton)
2043	N1	19.12.71	ANARE (Ackerly)
828	A4	14.2.80	ANARE (Kerry)

PETERSON ISLAND 66°28'S, 110°32'E Map 40 (Casey area)

Count	Nature	Date	Reference
4500	N3	1961	Orton (1963)
5000	N3	1972	ANARE (Luders)
10-15000	N4	6.12.72	ANARE
(A)8-10000	A3	1.2.74	ANARE
5946	A3	13.2.80	ANARE (Kerry)

ODBERT ISLAND 66°22'S, 110°33'E Map 41 (Casey area)

Count	Nature	Date	Reference
3500	N3	1961	Orton (1963)
1000+	N4	1972	ANARE (Luders)
20000	N4	6.12.72	ANARE

BLAKENEY POINT 66°14'S, 110°35'E Map 42 (Casey area)

Count	Nature	Date	Reference
2967	A3	14.2.80	ANARE (Kerry)

CAMERON ISLAND 66°13'S, 110°37'E Map 43 (Casey area)

Count	Nature	Date	Reference
350	N3	1961	Orton (1963)
540	A3	14.2.80	ANARE (Kerry)

BERKELY ISLAND 66°13'S, 110°39'E Map 43 (Casey area)

Count	Nature	Date	Reference
500	N3	1961	Orton (1963)
2388	A3	14.2.80	ANARE (Kerry)

HENRY ISLANDS 66°53'S, 120°38'E (Sabrina Coast area)

Count	Nature	Date	Reference
50	A4	24.2.60	ANARE (McLeod)

CHICK ISLAND 66°47'S, 120°59'E (Sabrina Coast area)

Count	Nature	Date	Reference
44	C1	23.2.60	ANARE (Dingle)
55	N2	23.2.60	ANARE (Dingle)
120	A2	21.1.62	ANARE (Orton)
223	C1	21.1.62	ANARE (Orton)

LEWIS ISLAND 66°07'S, 134°22'E (Wilkes Coast area)

Count	Nature	Date	Reference
1835	N1	8.1.56	ANARE (Dowie)
1000	A3	12.1.58	ANARE (Brown)
900	C2	14.1.59	ANARE (Dingle)
1200	N2	17.1.60	ANARE
650	A2	28.2.60	ANARE (Dingle)

MACKELLAR ISLANDS 66°58'S, 142°39'E Map 44 (Commonwealth Bay area)

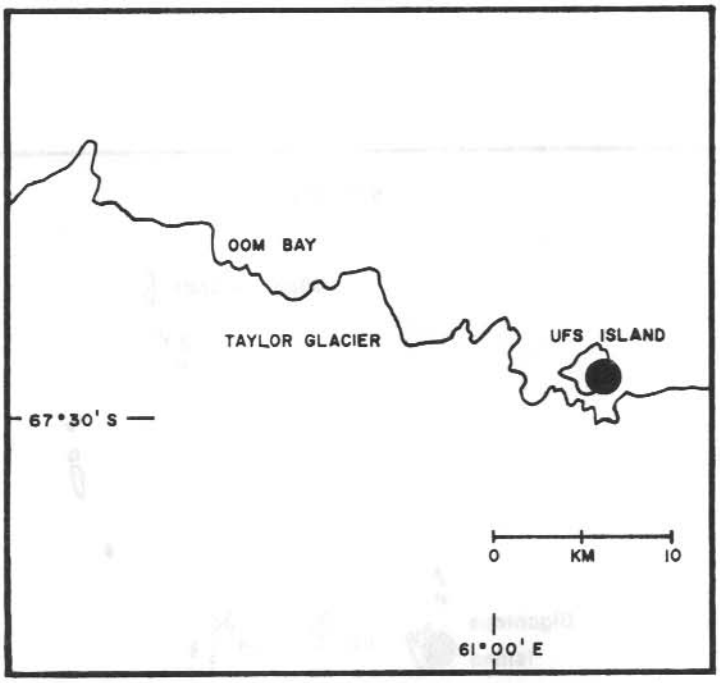
Count	Nature	Date	Reference
100000	A4	18.12.13	Falla (1937)
200000	A4	6.1.31	Falla (1937)

CAPE DENISON 67°00'S, 142°40'E Map 44 (Commonwealth Bay area)

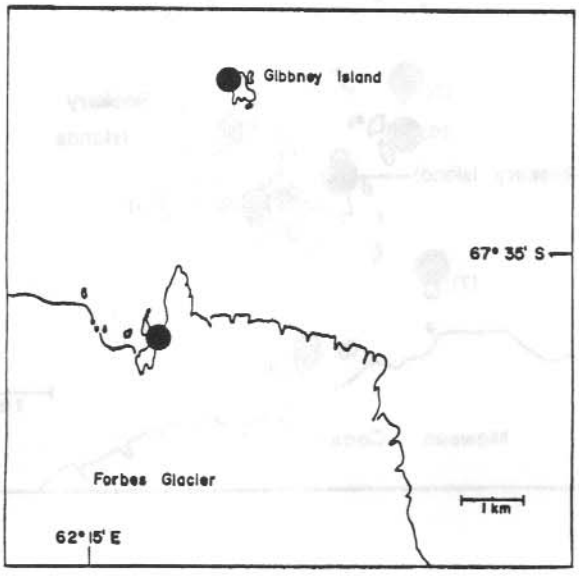
Count	Nature	Date	Reference
5000+	A4	1.31	Falla (1937)
2000	A3	14.1.74	ANARE (Jones)

WILSON HILLS 69°35'S, 158°30'E (Oates Land Coast area)

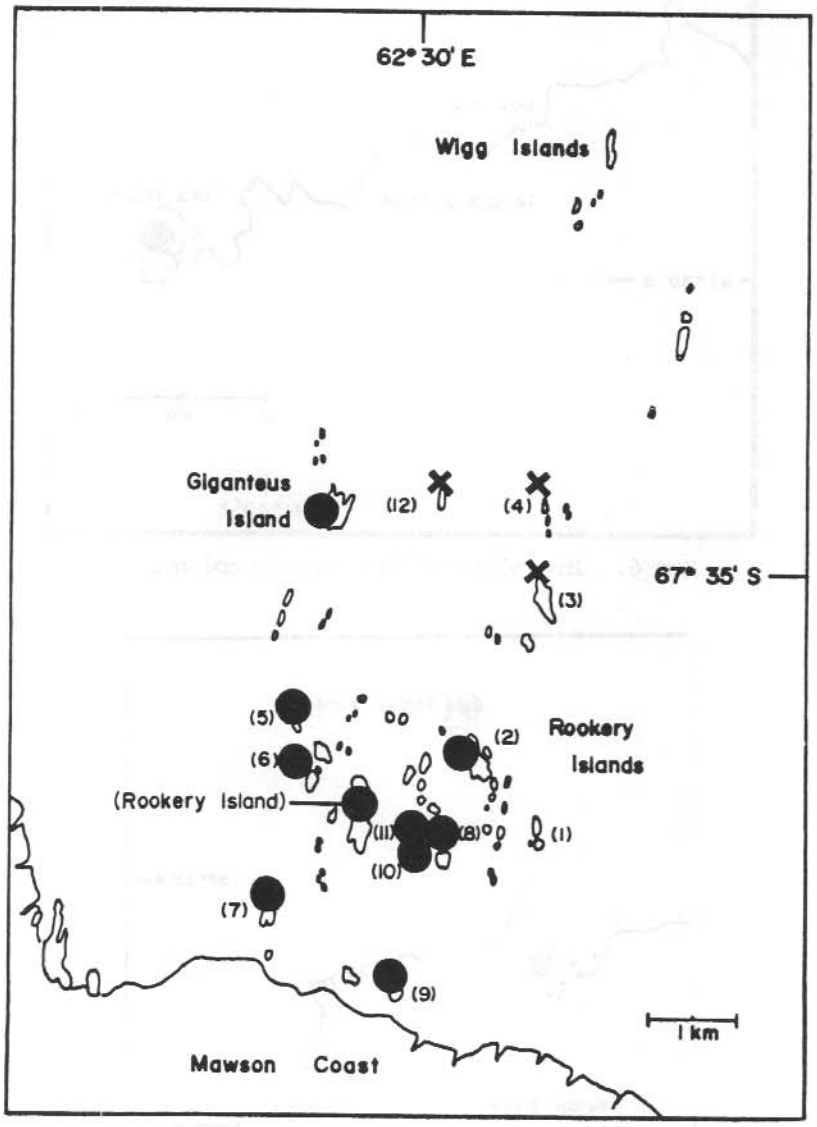
Count	Nature	Date	Reference
70	A3	21.2.59	ANARE (Dingle)



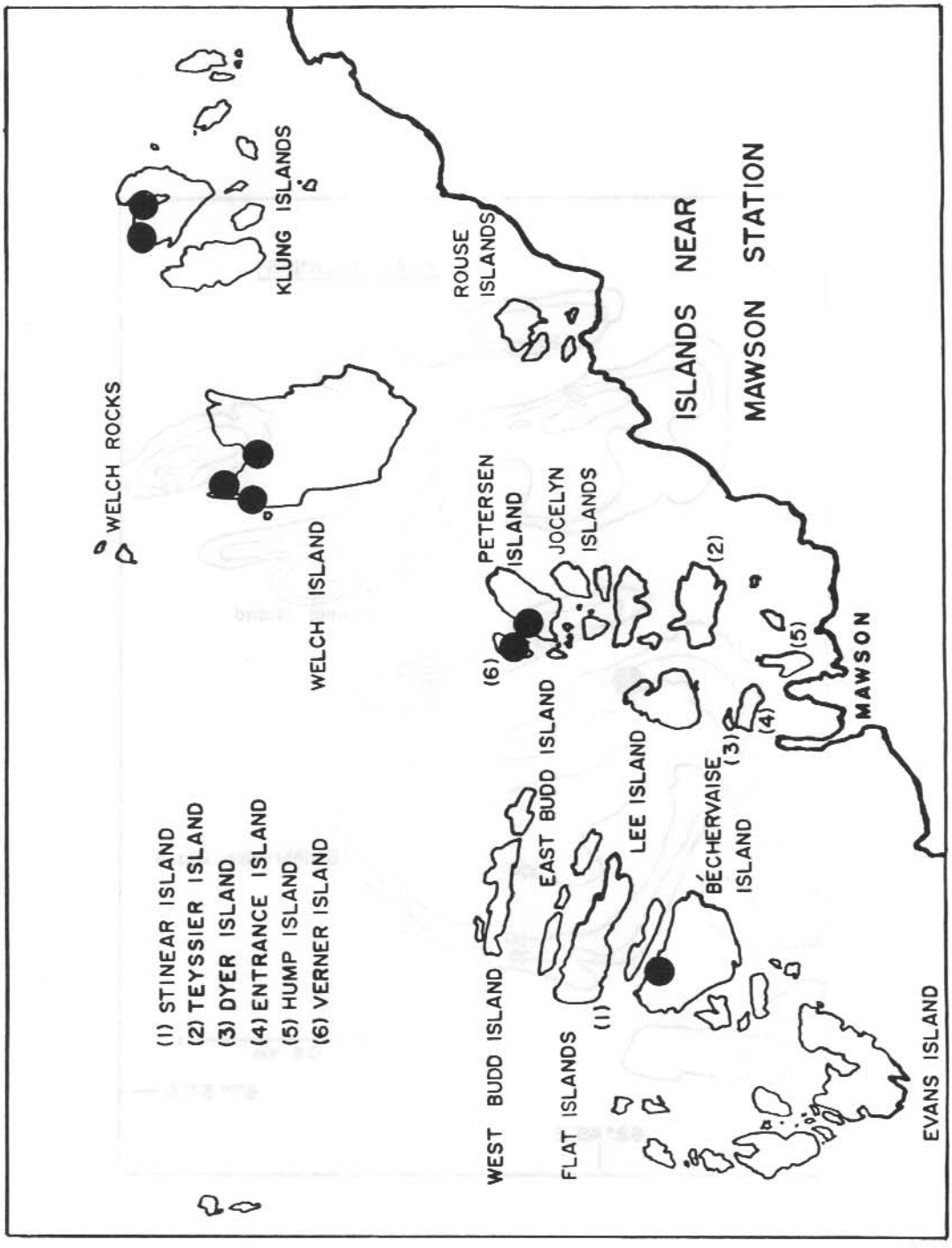
Map 6. Ufs Island Adelie Penguin colony.



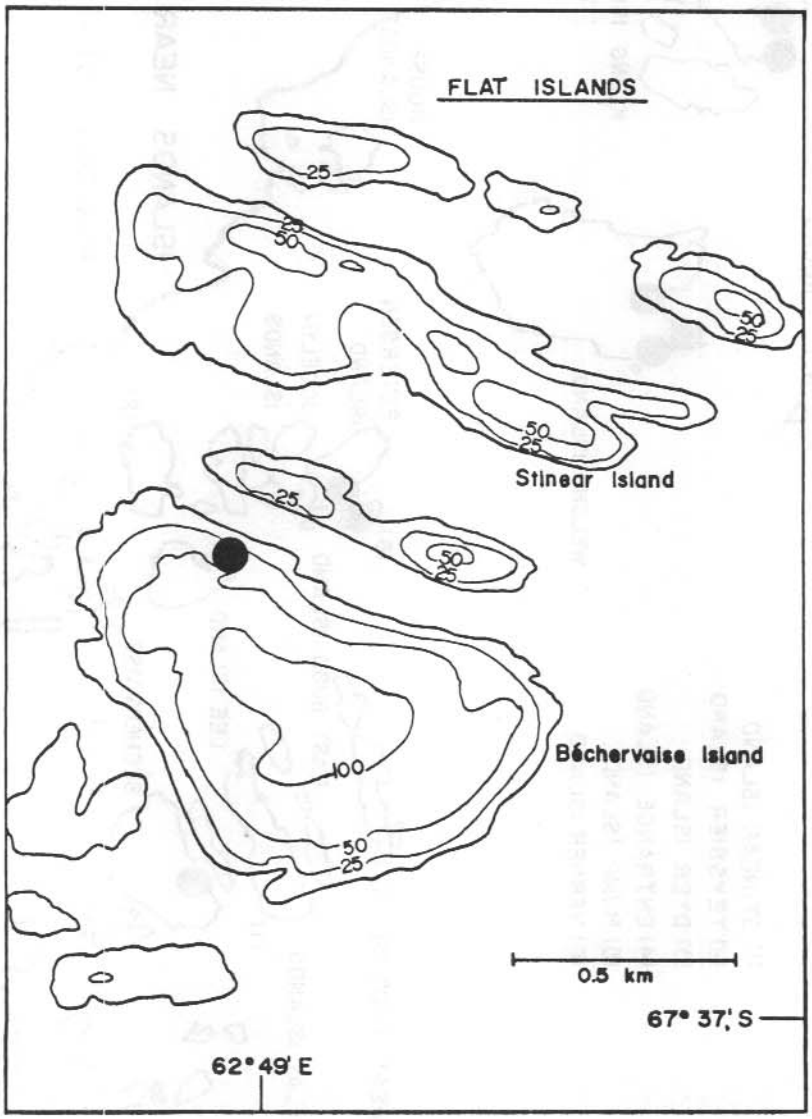
Map 7. Forbes Glacier and Gibbney Island Adelie Penguin colonies.



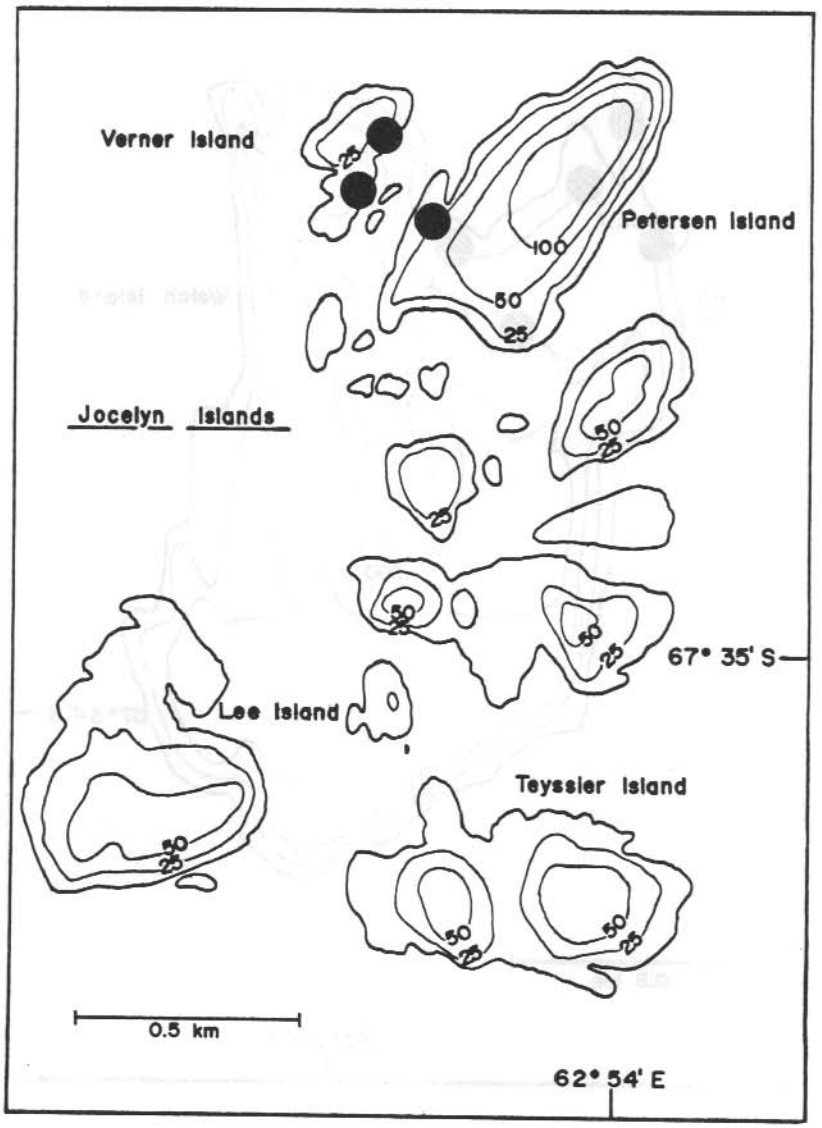
Map 8. Rookery Islands and Giganteus Island Adelie Penguin colonies.



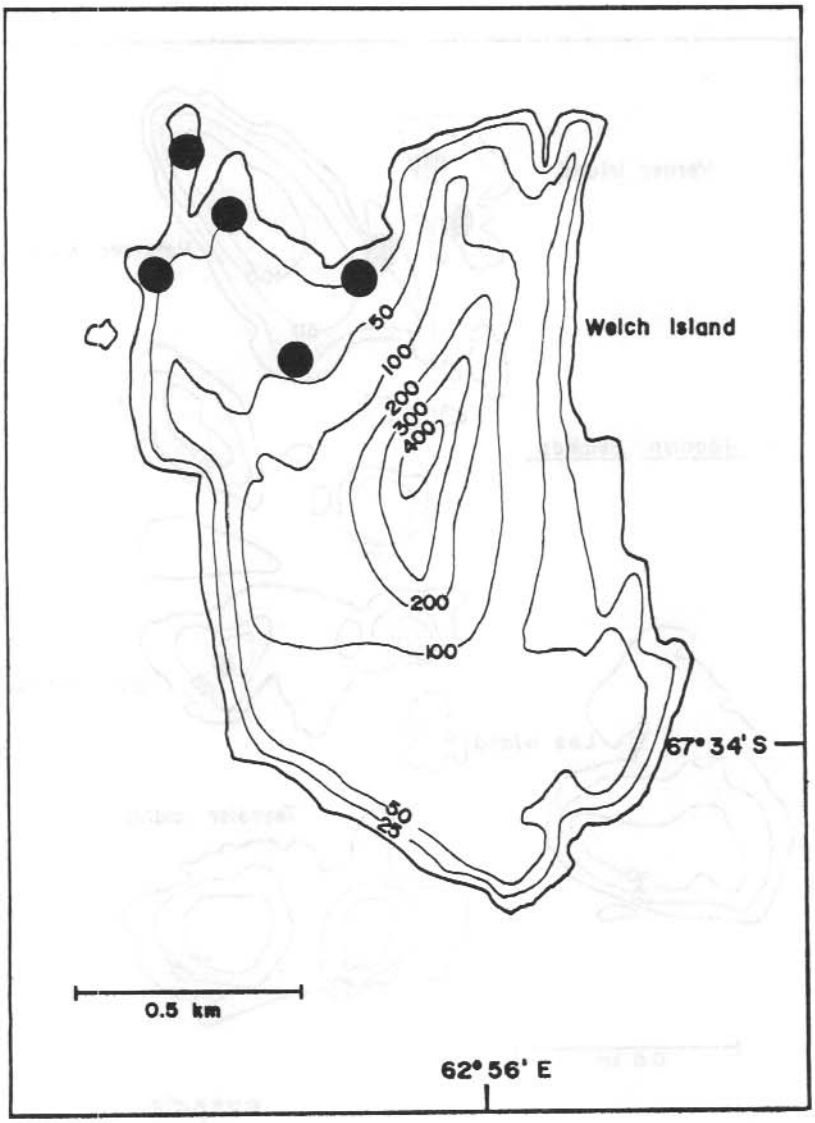
Map 9. Islands near Mawson Station.



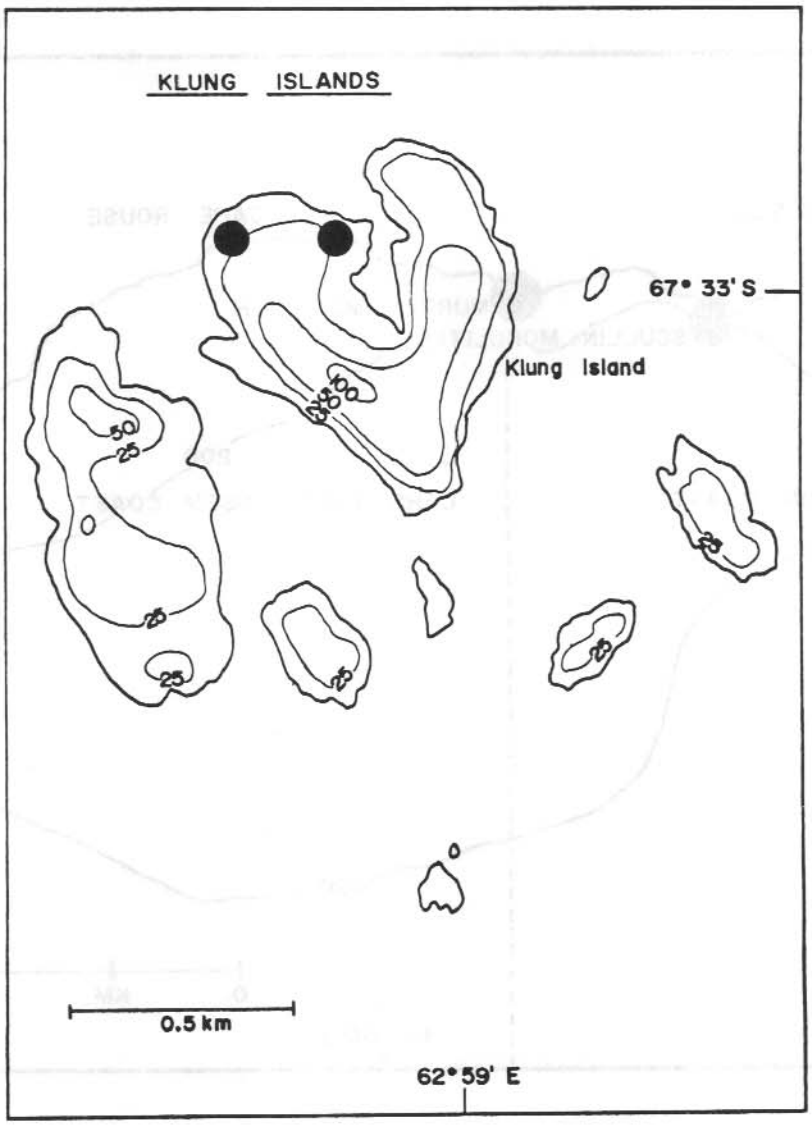
Map 10. Bechervaise Island Adelie Penguin colony.



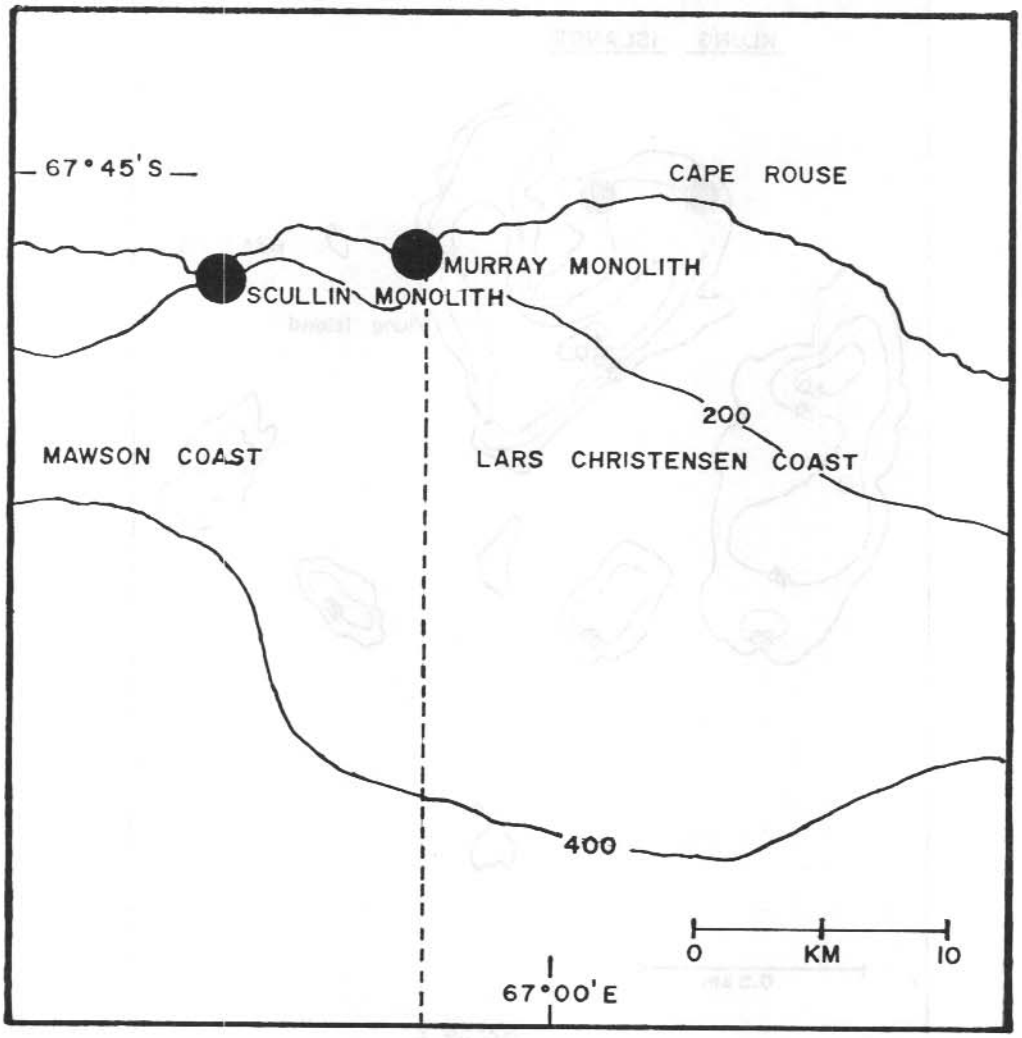
Map 11. Verner Island and Petersen Island Adelie Penguin colonies.



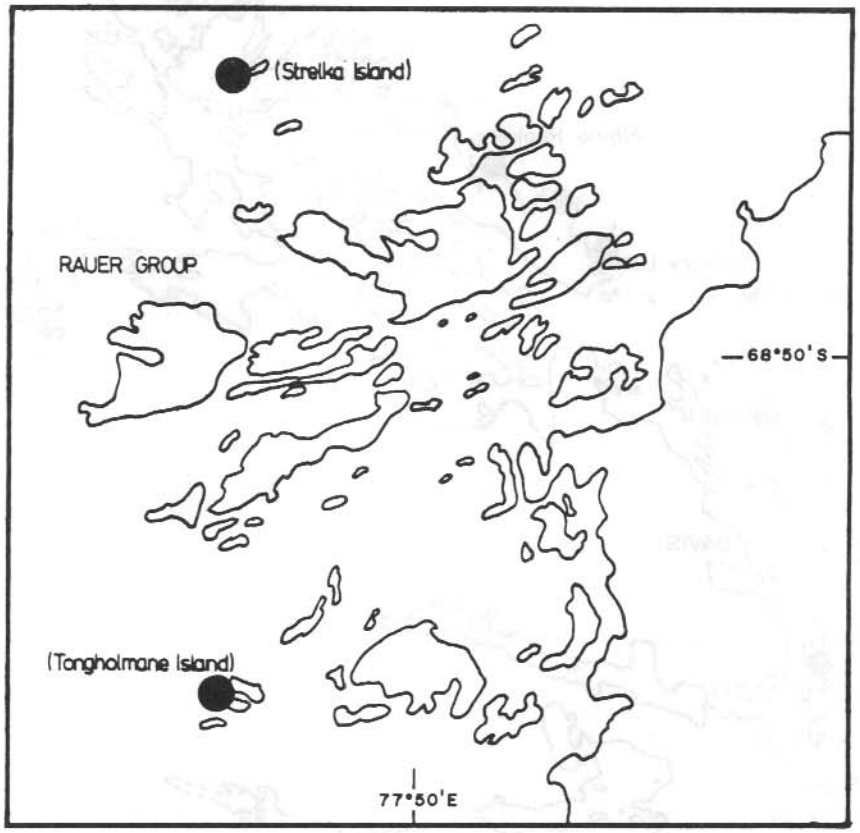
Map 12. Welch Island Adelie Penguin colonies.



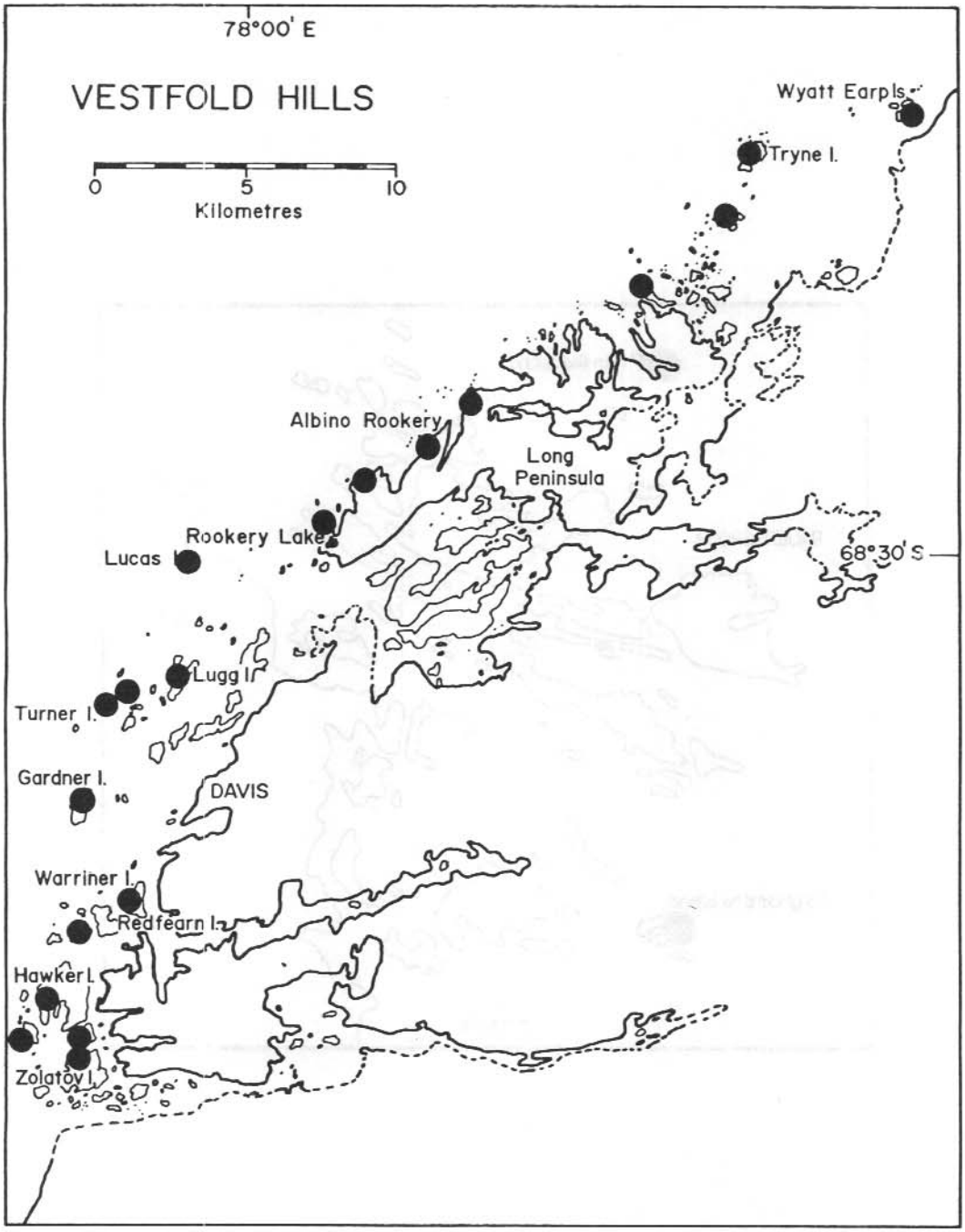
Map 13. Klung Island Adelie Penguin colonies.



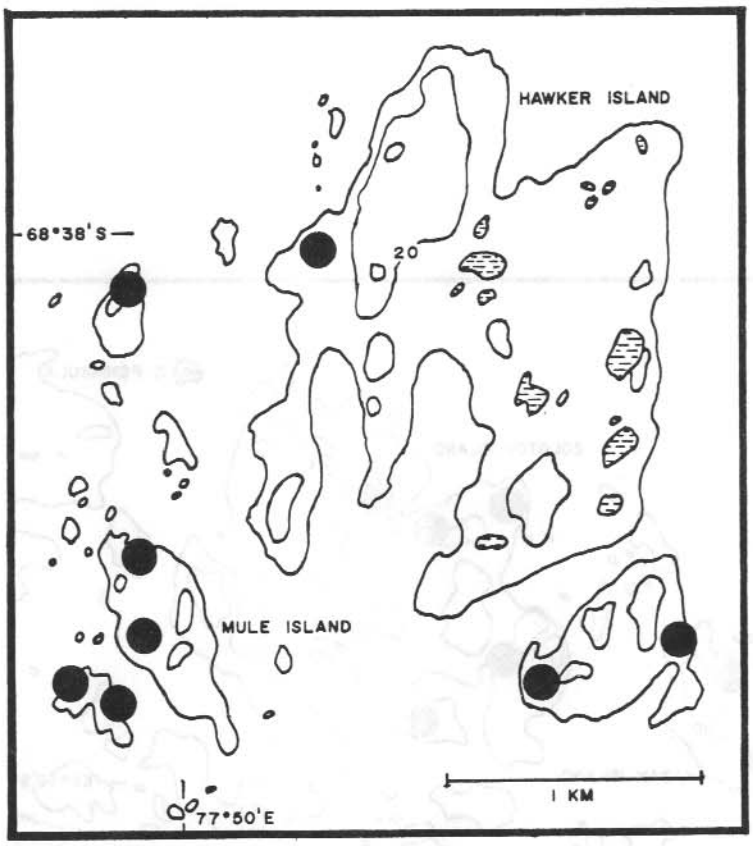
Map 14. Scullin Monolith and Murray Monolith Adelie Penguin colonies.



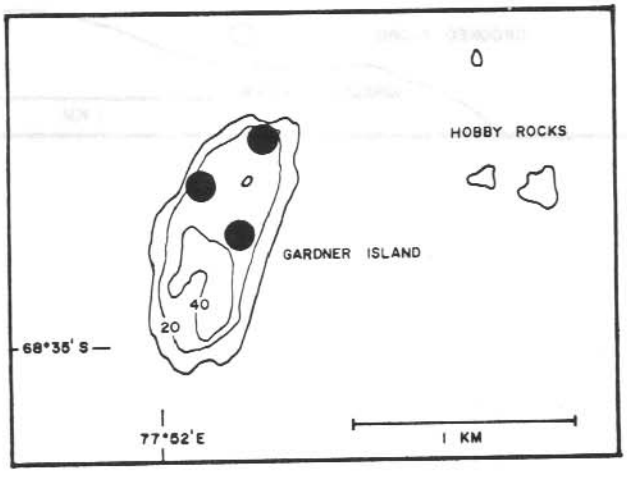
Map 15. Rauer Group Adelie Penguin colonies.



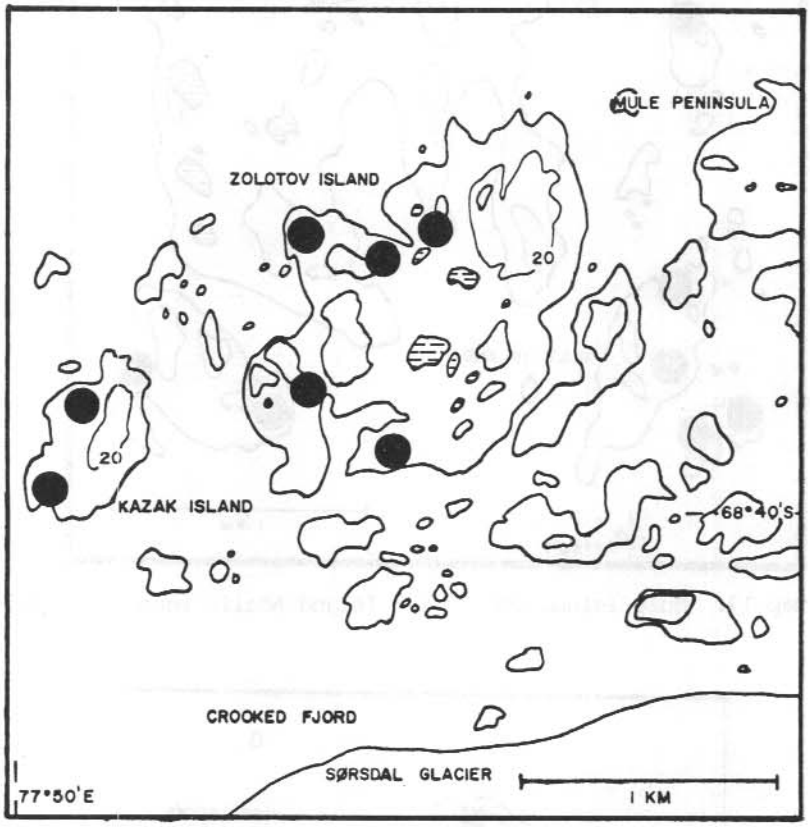
Map 16. The Vestfold Hills region.



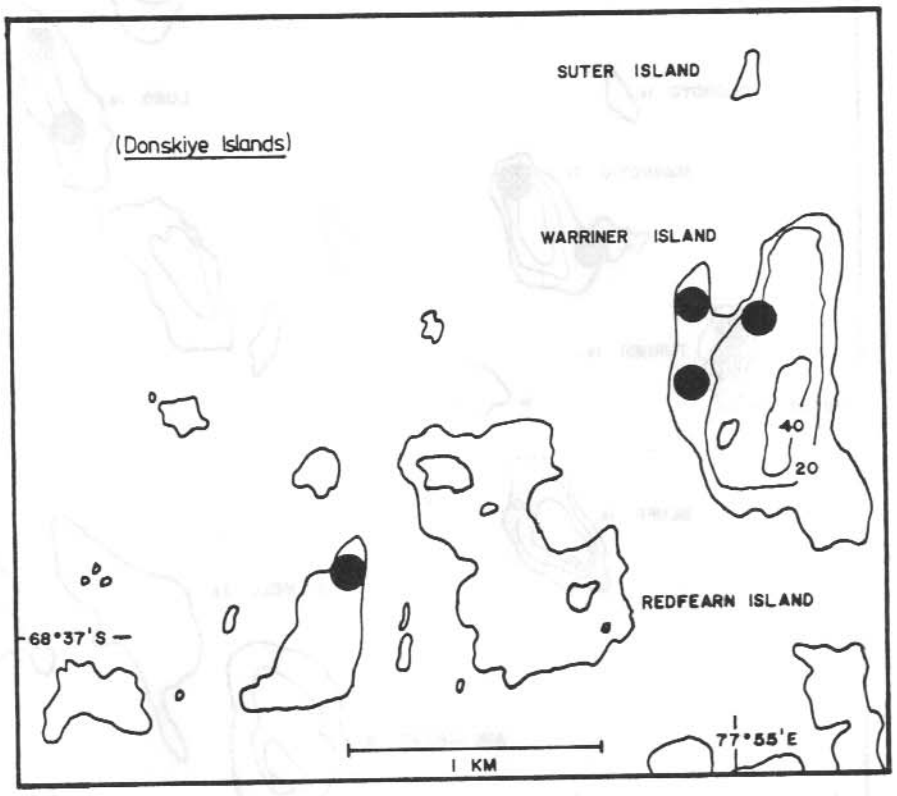
Map 17. Mule Island and Hawker Island Adelie Penguin colonies.



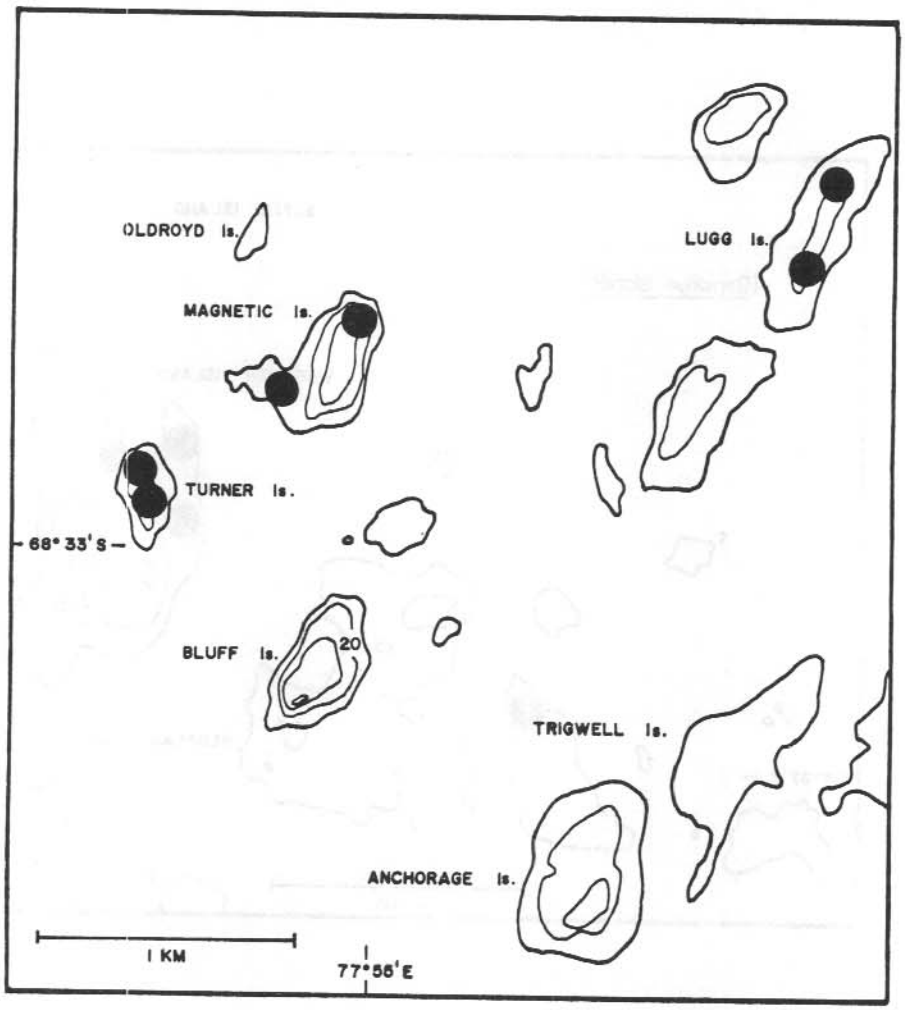
Map 18. Gardner Island Adelie Penguin colonies.



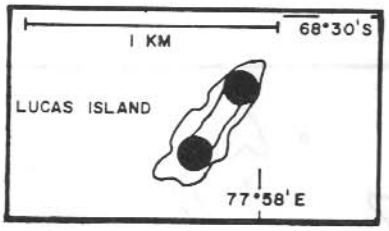
Map 19. Zolotov Island and Kazak Island Adelie Penguin colonies.



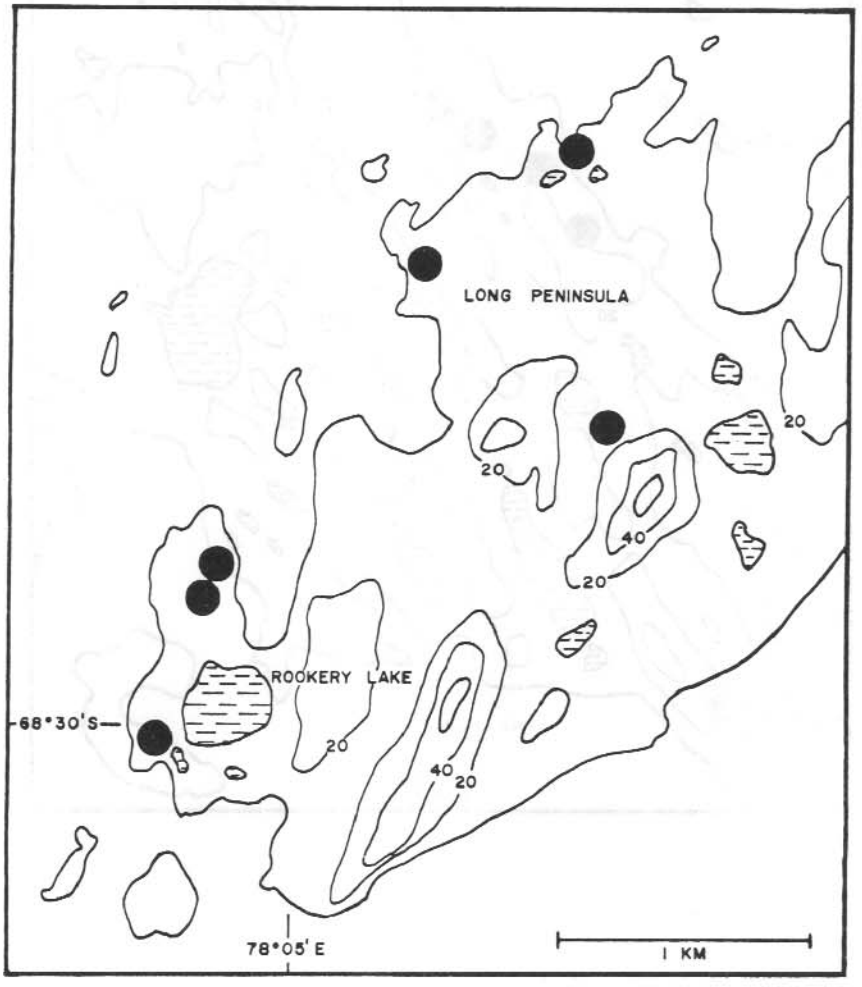
Map 20. Donskiye Islands and Warriner Island Adelie Penguin colonies.



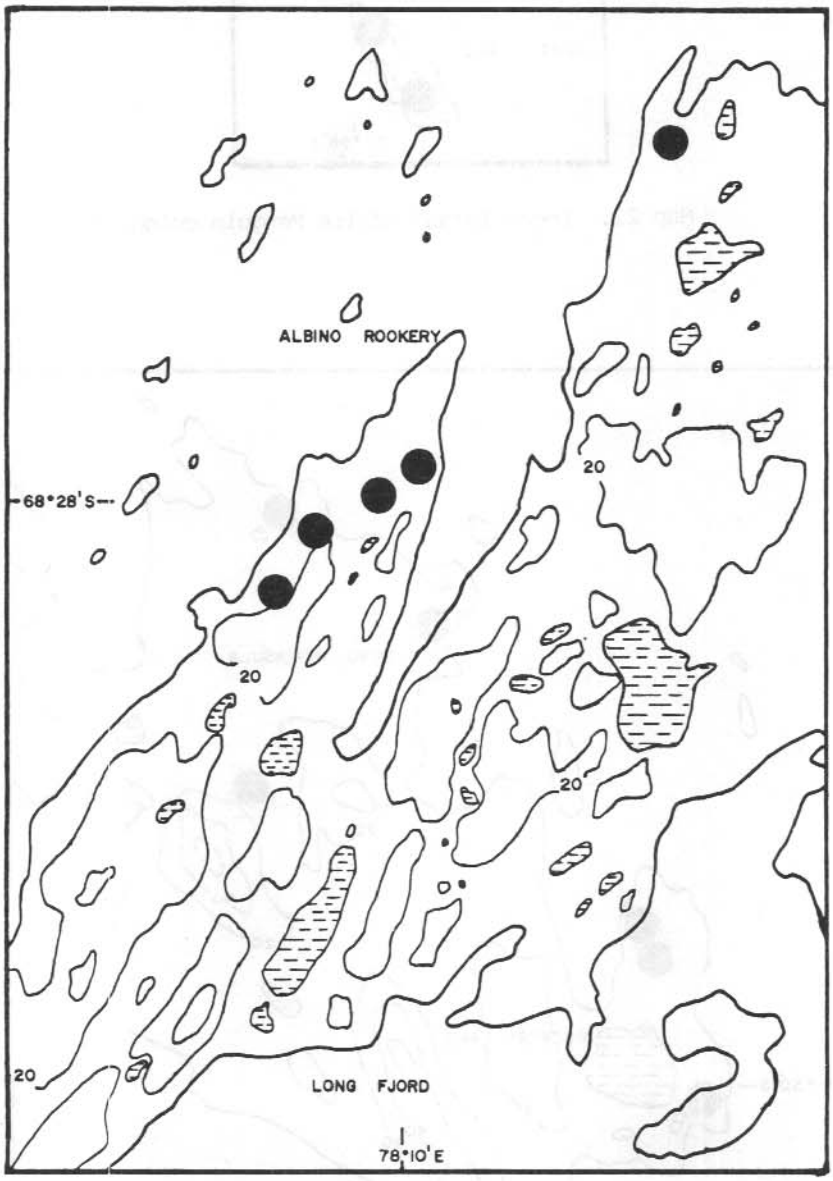
Map 21. Turner Island, Magnetic Island and Lugg Island Adelie Penguin colonies.



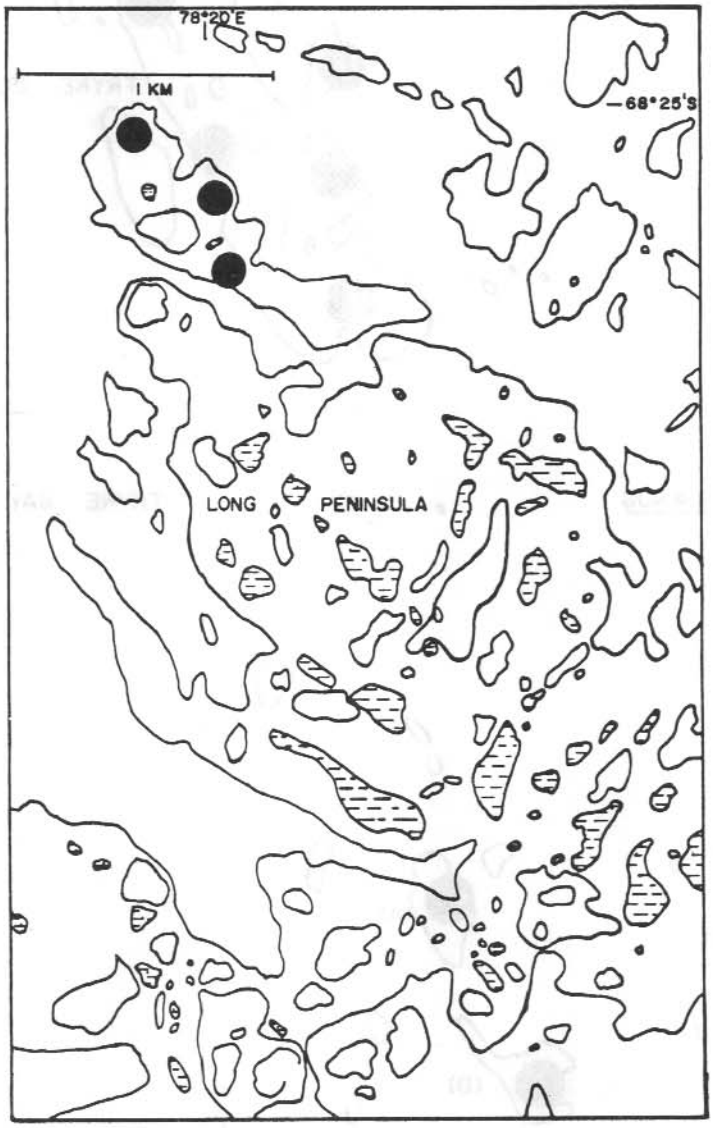
Map 22. Lucas Island Adelie Penguin colonies.



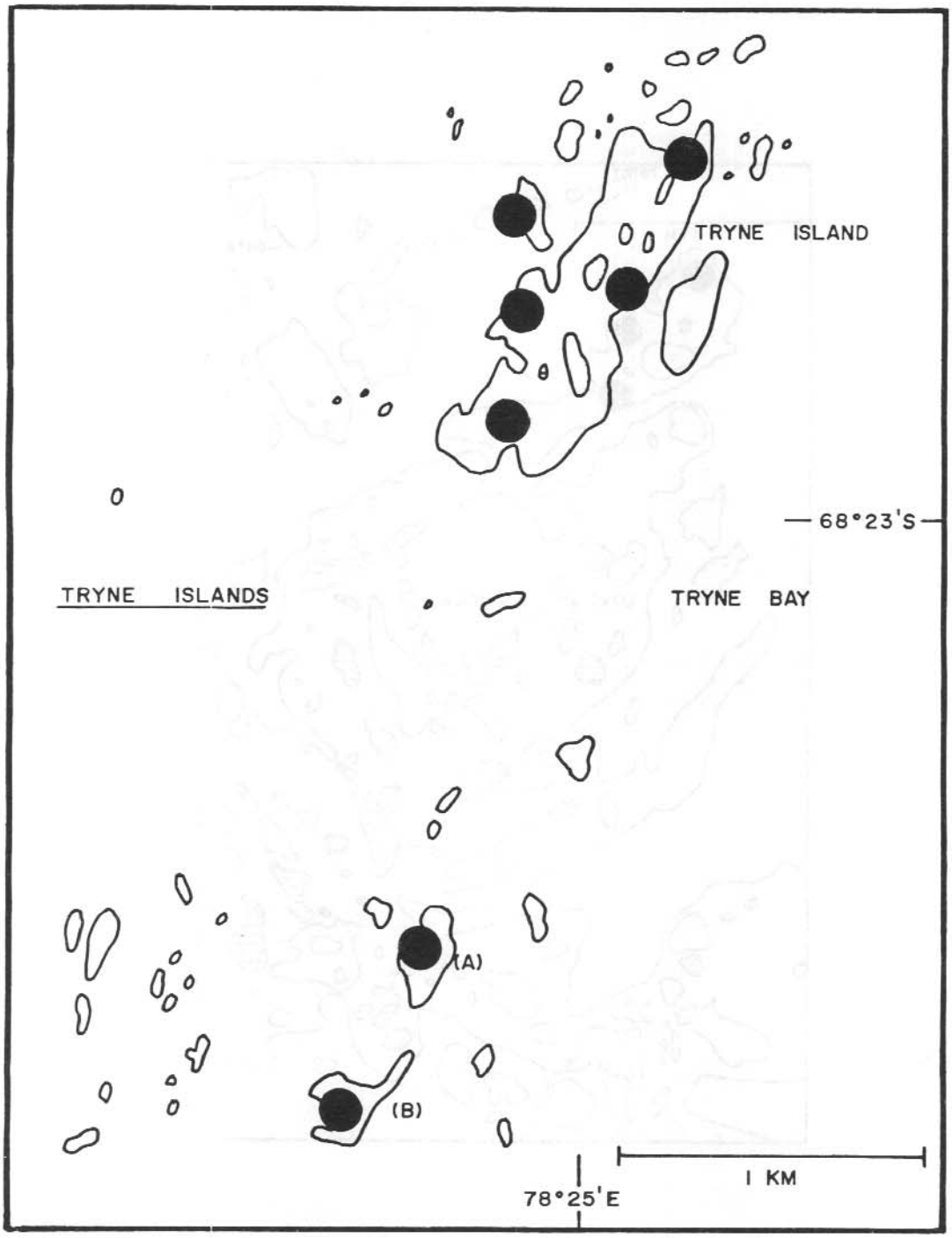
Map 23. Rookery Lake and Long Peninsula Adelie Penguin colonies.



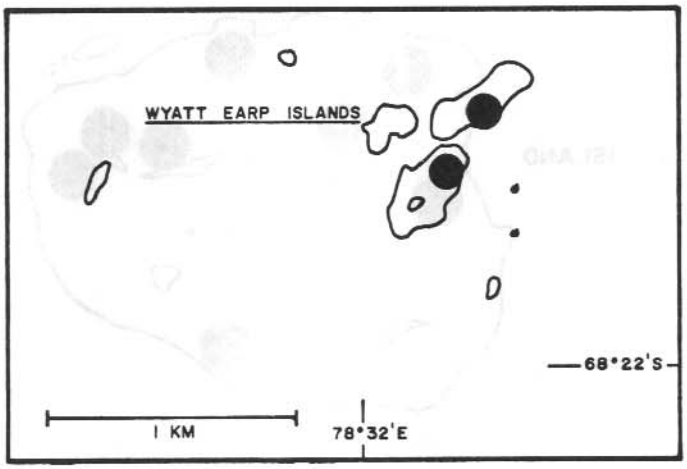
Map 24. Albino Rookery Adelie Penguin colonies.



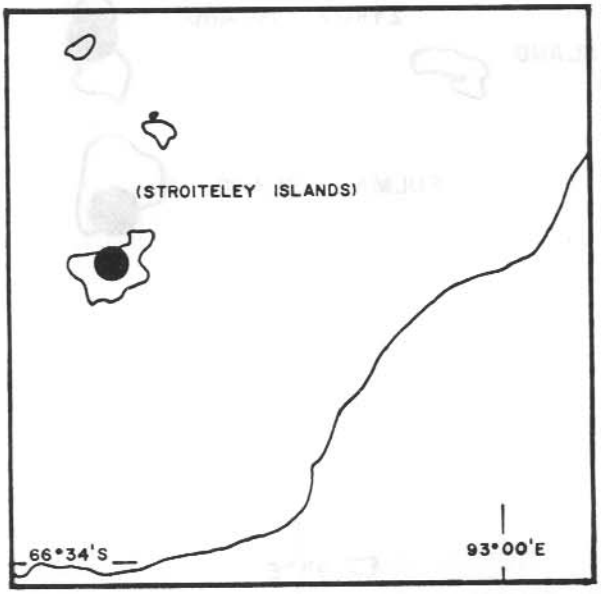
Map 25. Adelie Penguin colonies on unnamed island off Long Peninsula.



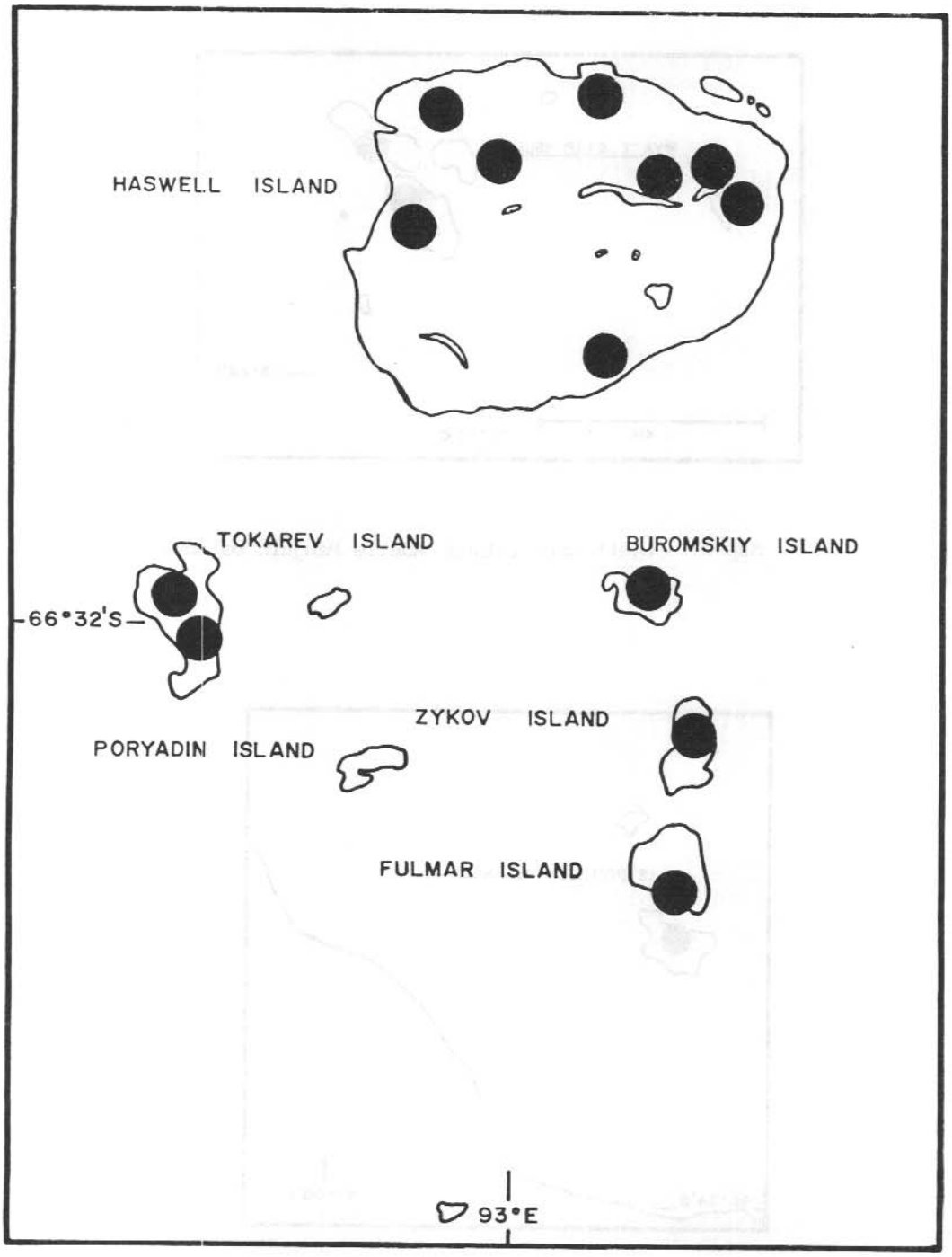
Map 26. Tryne Islands and Tryne Island Adelie Penguin colonies.



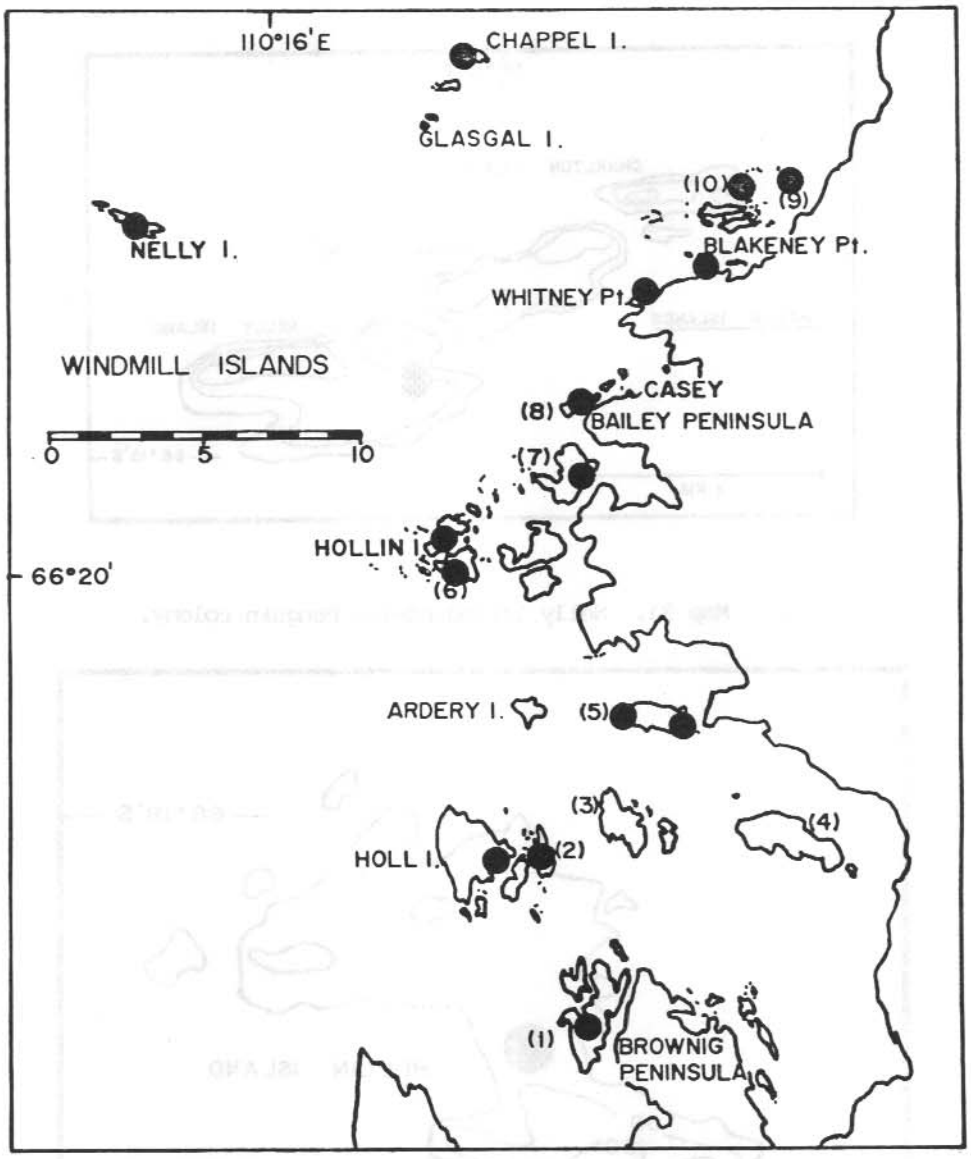
Map 27. Wyatt Earp Islands Adelie Penguin colony.



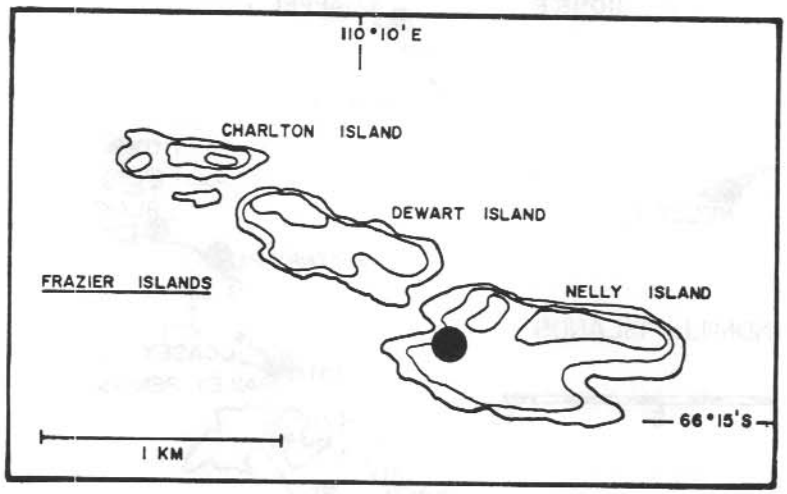
Map 28. Stroiteley Islands Adelie Penguin colony.



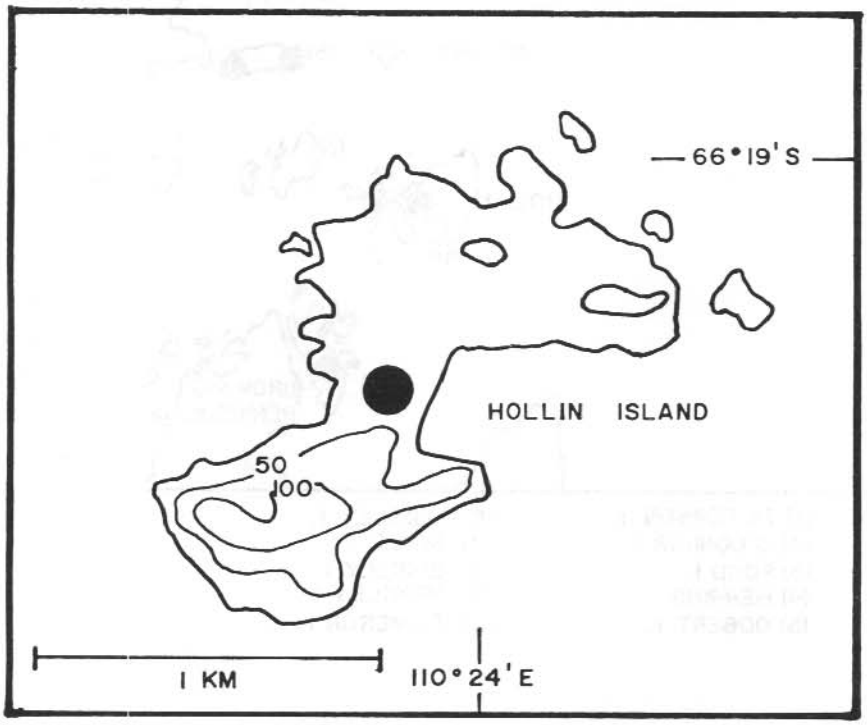
Map 29. Haswell Island, Tokarev Island, Buromskiy Island, Zykov Island, and Fulmar Island Adelie Penguin colonies.



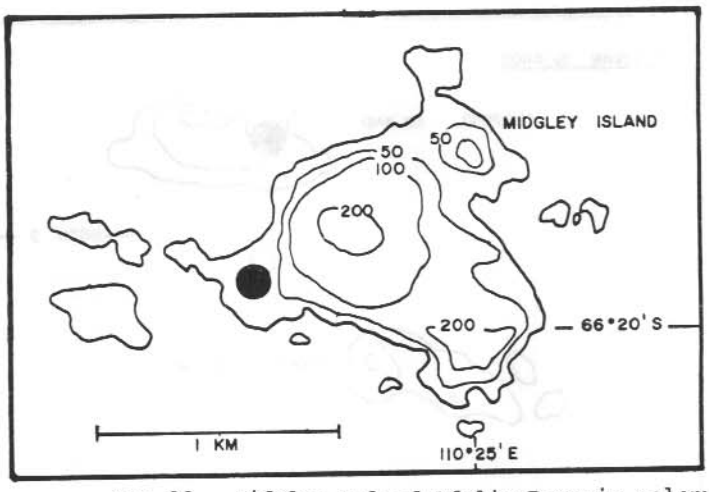
Map 30. The Windmill Islands region.



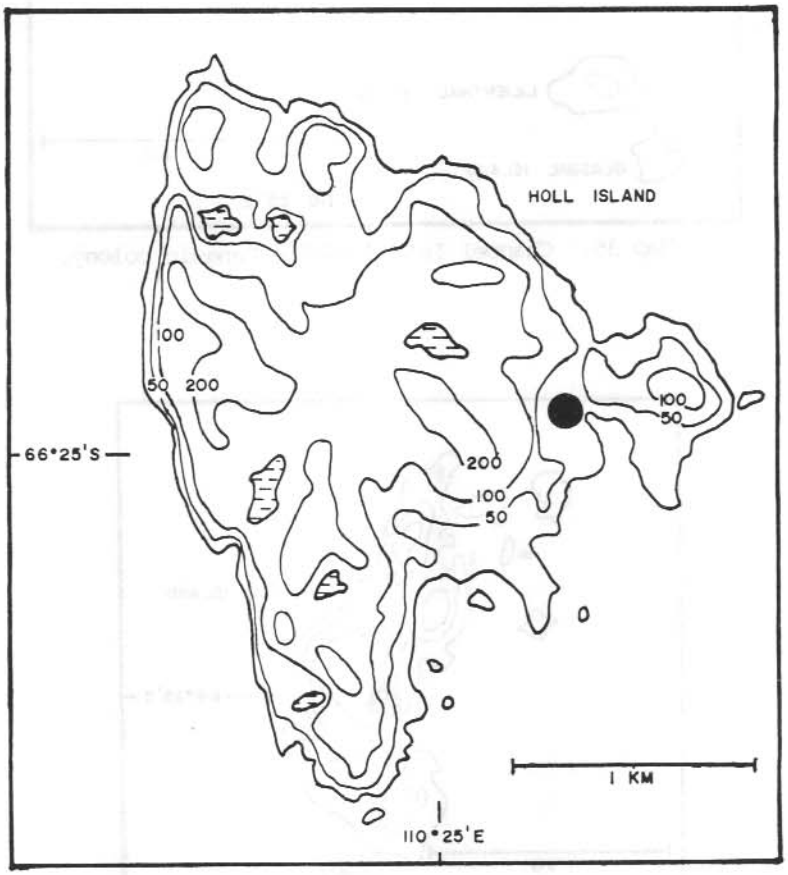
Map 31. Nelly Island Adelie Penguin colony.



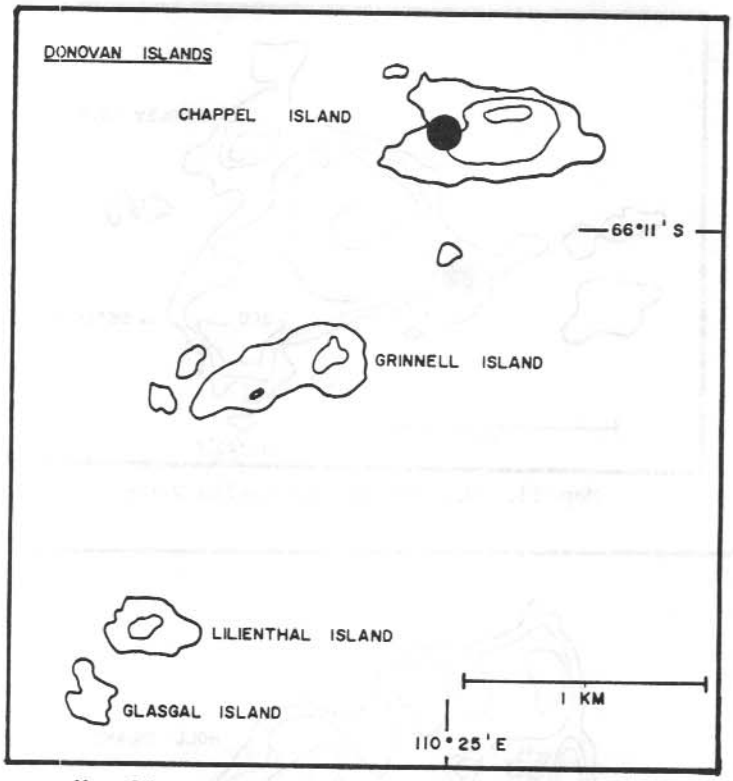
Map 32. Hollin Island Adelie Penguin colony.



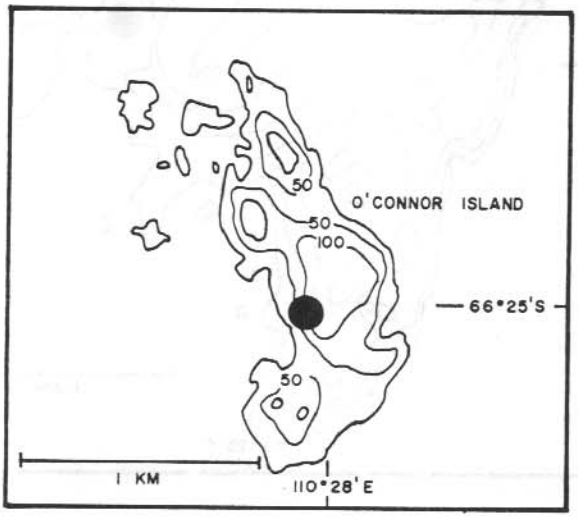
Map 33. Midgley Island Adelie Penguin colony.



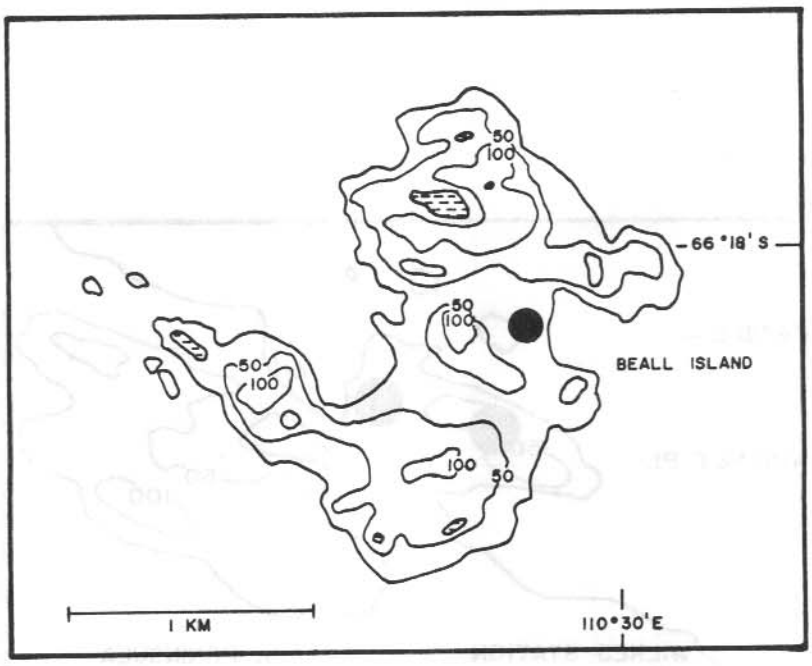
Map 34. Holl Island Adelie Penguin colony.



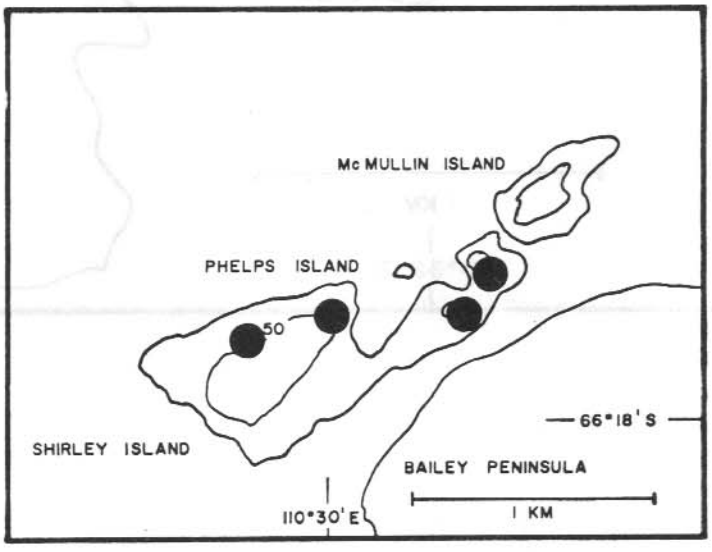
Map 35. Chappel Island Adelie Penguin colony.



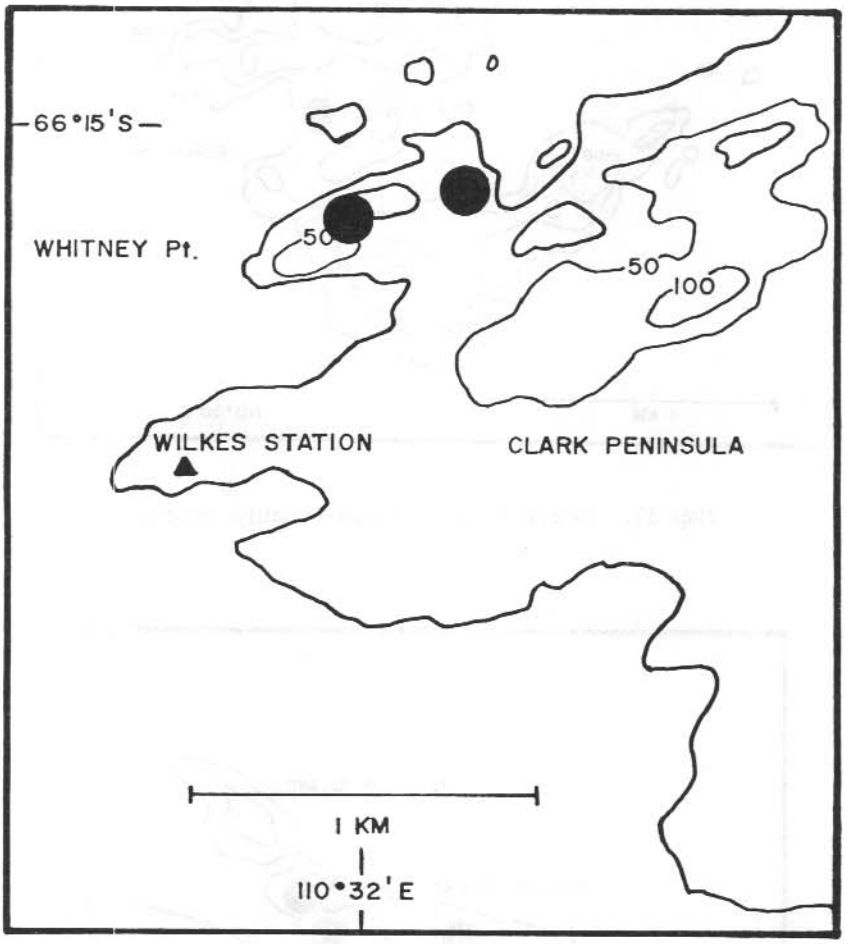
Map 36. O'Connor Island Adelie Penguin colony.



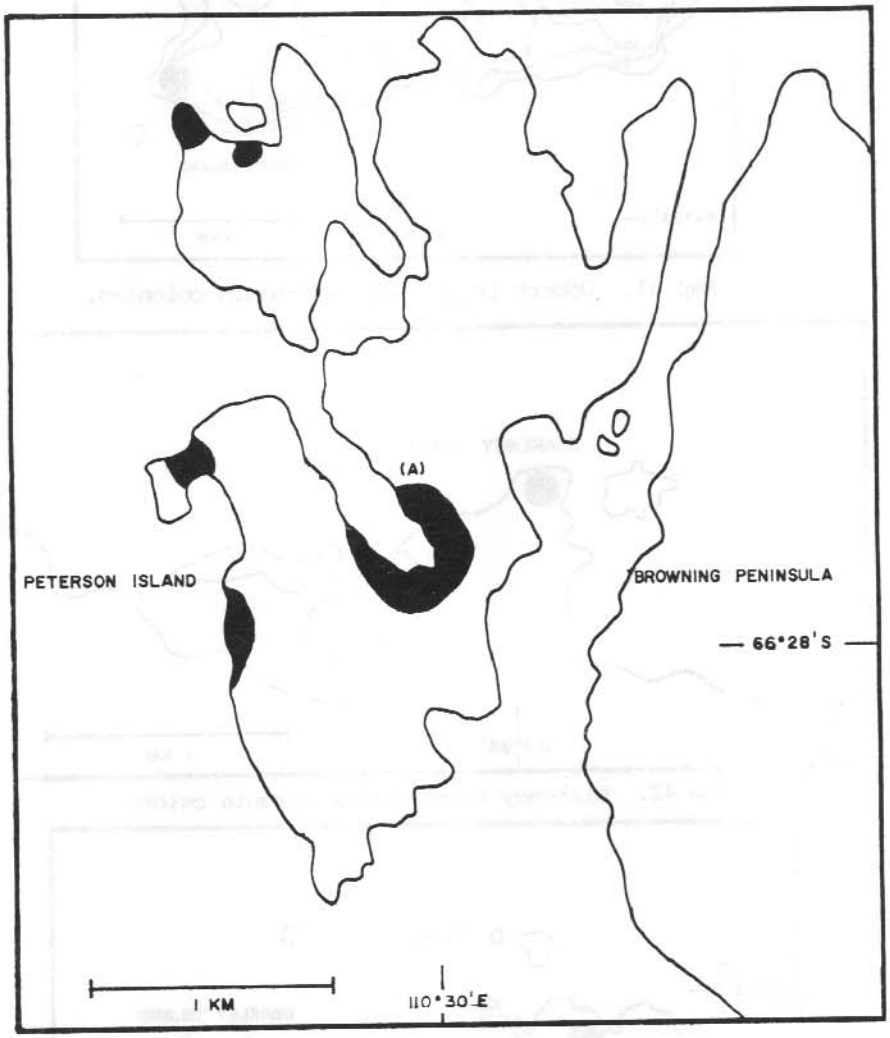
Map 37. Beall Island Adelie Penguin colony.



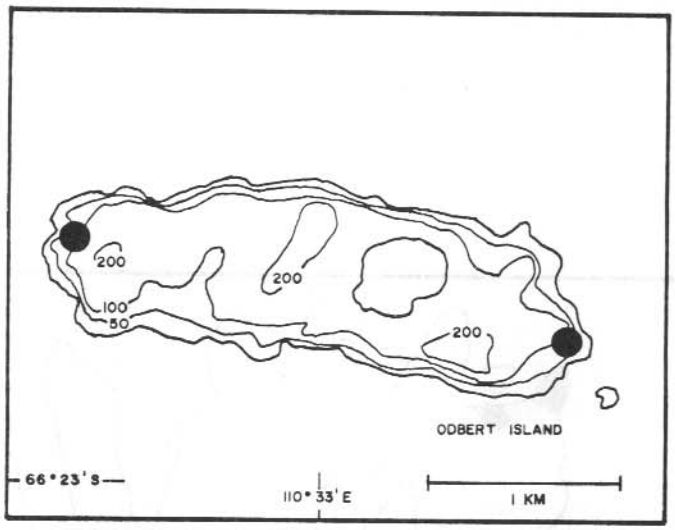
Map 38. Shirley Island Adelie Penguin colonies.



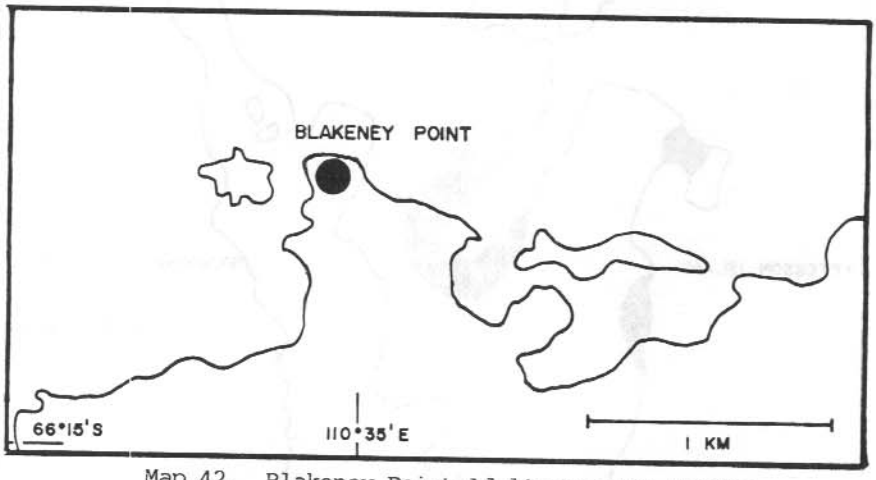
Map 39. Whitney Point Adelie Penguin colonies.



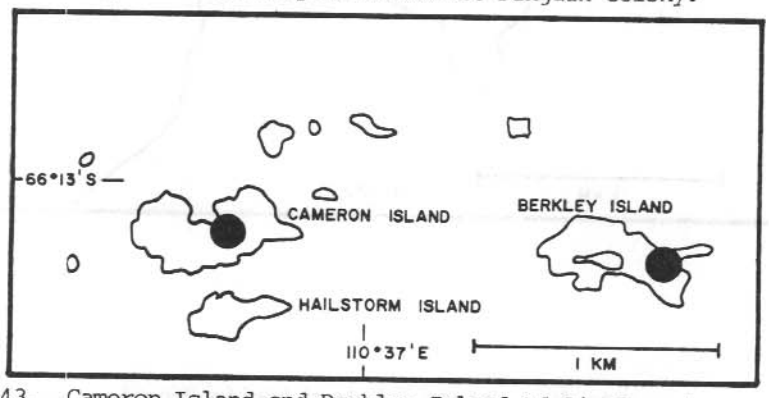
Map 40. Peterson Island Adelie Penguin colonies.



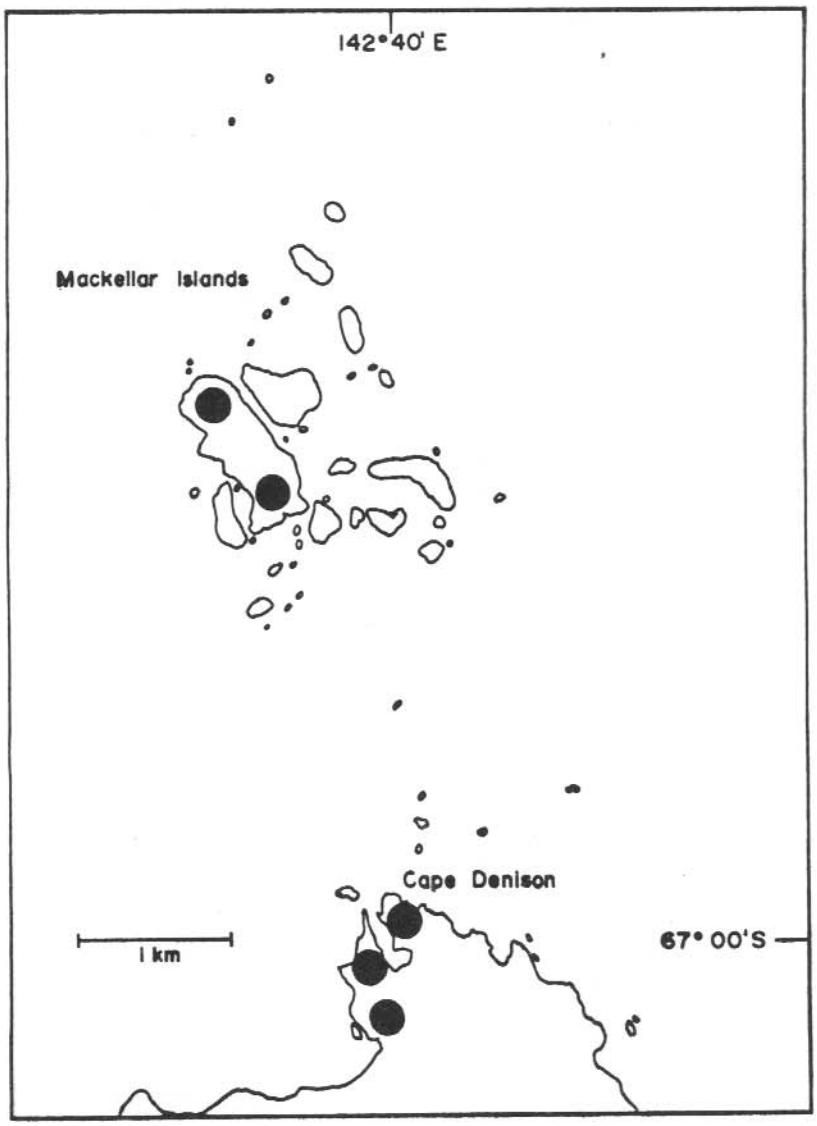
Map 41. Odbert Island Adelie Penguin colonies.



Map 42. Blakeney Point Adelie Penguin colony.



Map 43. Cameron Island and Berkley Island Adelie Penguin colonies.



Map 44. Mackellar Islands and Cape Denison Adelie Penguin colonies.

4. HEARD ISLAND

4.1 KING PENGUIN (Aptenodytes patagonica)

The King Penguin breeds on the Falkland Islands, South Georgia, Prince Edward Island, Marion Island, Iles Crozet, Iles Kerguelen, Heard Island and Macquarie Island, and possibly on the South Sandwich Islands.

Chick rearing takes 10 to 13 months and lasts through the winter, thus reproduction in King Penguins is apparently on a unique 3-year cycle during which a pair can successfully rear only two chicks. Eggs are laid between late November and early March and incubation lasts 52 days. The chicks are brooded for about 30 days and fledging occurs from November to April of the following year depending on the month of hatching.

King Penguins generally breed in very large colonies numbering thousands of pairs. At Heard Island in 1948 a small group of less than twenty birds was found breeding in association with Gentoos at Vahsel Moraine. In the winter of 1948 they had successfully reared two chicks. Owing to an unfortunate failure to appreciate their rarity, the whole of this group was deported to Australian zoos in February 1949, the only survivors being a few birds which were at sea at the time. The recolonisation has been documented by Budd (1968, 1970) and Budd and Downes (1965).

RED ISLAND Map 45

Count	Nature	Date	Reference
1	A1	1969	Budd 1970
3	C/N1	3.80	ANARE (Johnstone)

ATLAS COVE Map 45

Count	Nature	Date	Reference
1	A1	1969	Budd (1970)
0	-	3.80	ANARE (Johnstone)

FAIRCHILD BEACH Map 45

Count	Nature	Date	Reference
3	A1	7.3.63	Budd (1970)
2	A1	1.2.65	Budd (1970)
0	-	15.3.69	Budd (1970)
0	-	3.80	ANARE (Johnstone)

SKUA BEACH Map 45

Count	Nature	Date	Reference
1	C1	6.3.63	Budd (1970)
1	C1	1.2.65	Budd (1970)
0	-	14.3.69	Budd (1970)
0	-	3.80	ANARE (Johnstone)

SPIT BAY (NORTH) Map 45

Count	Nature	Date	Reference
13	C1	20.2.63	Budd (1970)
36	C1	31.1.65	Budd (1970)
49	C1	14.3.69	Budd (1970)
82	C/N1	3.80	ANARE (Johnstone)

SPIT BAY (SOUTH) Map 45

Count	Nature	Date	Reference
5	C1	20.2.63	Budd (1970)
9	C1	31.1.65	Budd (1970)
37	C1	14.3.69	Budd (1970)
400	C/N3	3.80	ANARE (Johnstone)

LONG BEACH Map 45

Count	Nature	Date	Reference
4	A1	2.2.63	Budd (1968)
5	A1	15.2.65	Budd (1968)
37	C/N1	3.80	ANARE (Johnstone)

VAHSEL GLACIER (MORAINE) Map 45

Count	Nature	Date	Reference
1	C1	3.3.63	Budd (1970)
17	C1	17.3.69	Budd (1970)
47	N/C1	3.80	ANARE (Johnstone)

WEST BAY Map 45

Count	Nature	Date	Reference
1	A1	1969	Budd (1970)
0	-	3.80	ANARE (Johnstone)

4.2 GENTOO PENGUIN (Pygoscelis papua)

The Gentoo inhabits sub-Antarctic and Antarctic waters, but usually avoids areas of pack ice. In the Antarctic the Gentoo breeds on South Georgia, some of the South Sandwich Islands, South Orkney Islands, South Shetland Islands and on the Antarctic Peninsula south to about 65°S; and in the sub-Antarctic it breeds on Prince Edward Island, Marion Island, Iles Crozet, Iles Kerguelen, Heard Island and Macquarie island. Most birds in the Antarctic Peninsula populations probably migrate north after breeding, but Indian Ocean and Macquarie Island populations are often sedentary around the breeding islands. Gentoo Penguins are distributed in small or medium-size colonies round the shores of Heard Island. Colonies are generally close to shore and situated on open vegetated flats and hillsides, the nests usually being among tussock or on Azorella hummocks. Nest sites are moved each year.

Gentoos are present on Heard Island all year round, however numbers are greatly reduced in winter. Nest building commences the second or third week in October. The nests are often substantial, usually made from grass leaves, stems or roots, but sometimes Azorella is used. Eggs are usually laid in the third week of October. Normally two eggs are laid approximately three days apart; incubation begins shortly before the second egg is laid and lasts 35-36 days. The chicks are then guarded for four weeks. The chick which is first to hatch is conspicuously larger but usually both chicks are raised to fledging.

RED ISLAND Map 46

Count	Nature	Date	Reference
500-1000	A4	1950	Downes (1959)

(JACKA VALLEY) Map 46

Count	Nature	Date	Reference
300	A3	1953	Downes (1959)

(WHARF POINT) Map 46

Count	Nature	Date	Reference
60	A2	1948-49	Downes (1959)

After 1950 no attempt to nest, probably because of the introduction of Huskies to the station in 1950; but apparently had nested there in 1979/80 season (G.W. Johnstone pers. comm.).

(LITTLE BEACH) Map 46

Count	Nature	Date	Reference
350-500	A4	6.9.53	Downes (1959)

SADDLE POINT Map 46

Count	Nature	Date	Reference
1000	A4	1950	Downes (1959)

FAIRCHILD BEACH Map 46

Count	Nature	Date	Reference
1000	A4	1950	Downes (1959)

SKUA BEACH Map 46

Count	Nature	Date	Reference
1000	A4	1950	Downes (1959)

SPIT BAY Map 46

Count	Nature	Date	Reference
Thousands	A5	1951	Downes (1959)

WINSTON LAGOON Map 46

Count	Nature	Date	Reference
Small colony	A5	1951	Downes (1959)

LONG BEACH Map 46

Count	Nature	Date	Reference
Thousands	A4	1951	Downes (1959)

CAPE GAZERT Map 46

Count	Nature	Date	Reference
250	A3	1950	Downes (1959)

ERRATIC POINT

Count	Nature	Date	Reference
185	A2	1950	Downes (1959)
81	A1	1954	Downes (1959)

(VAHSEL MORAINE) Map 46

Count	Nature	Date	Reference
400	A2	1950	Downes (1959)
412	N1	1954	Downes (1959)

WEST BAY Map 46

Count	Nature	Date	Reference
300	A2	1950	Downes (1959)
242	N1	1952	Downes (1959)
250	N2	1953	Downes (1959)

4.3 MACARONI PENGUIN (Eudyptes chrysolophus)

Macaroni penguins breed on South Georgia, the South Sandwich Islands, South Orkney Islands, South Shetland Islands and on the Antarctic Peninsula; and on Bouvetøya, Prince Edward Island, Marion Island, Iles Crozet, Iles Kerguelen, Heard Island and the McDonald Islands.

The first Macaronis return to their natal colonies towards the end of October, the males arriving first. The first eggs are laid on about 10 November. Clutches of two eggs are normally laid three to five days apart. Of these two eggs, the first is always much smaller than the second and is always rejected long before the chicks are due to hatch. Incubation commences after laying of the second egg and lasts 35 to 37 days. Females take the first shift of incubation while the males are at sea for about 15 days. Females usually return just before hatching. Both birds remain at the nest for two or three days, the female feeding the chick at frequent intervals. The female then goes to sea again leaving the male on guard.

HEARD ISLAND Map 47

Count	Nature	Date	Reference
Hundreds of Thousands	A5	-	Downes (1959)

The Macaroni is by far the most numerous species of penguin on Heard Island and the bulk of the population is concentrated into huge colonies often numbering many thousands of pairs. The vast colonies on the southern slopes of Mount Olsen number hundreds of thousands of pairs. Other large colonies are situated all along the west coast of the Laurens Peninsula, up to the very large colony at Red Island. Other very large colonies are found at the north end of the (Black Cliffs), at Rogers Head, and at Corinth Head. The largest colony of all occurs at Long Beach. Other small colonies occur at various intermediate points.

4.4 ROCKHOPPER PENGUIN (Eudtyptes chrysocome)

The Rockhopper breeds throughout the sub-Antarctic at islands near Cape Horn, the Falklands Islands, the Tristan da Cunha Group, Gough Island, Marion Island, Prince Edward Island, Iles Crozet, Heard Island, Ile St Paul, Ile Amsterdam, Iles Kerguelen, Macquarie Island, Auckland Islands, Campbell Island, Bounty Island and Antipodes Island (Serventy et al, 1971).

At Heard Island breeding males return to the nest sites they held the previous year during the first two weeks of November and are joined by their mates about six days later. In 1950 the first egg was found on 23 November. Incubation commences after the second egg has been laid and lasts 34 days. Generally both eggs hatch but the chick from the first laid egg does not survive long. The chicks are guarded for 19-23 days until they enter creches. Chicks leave the colony when they are about 70 days old.

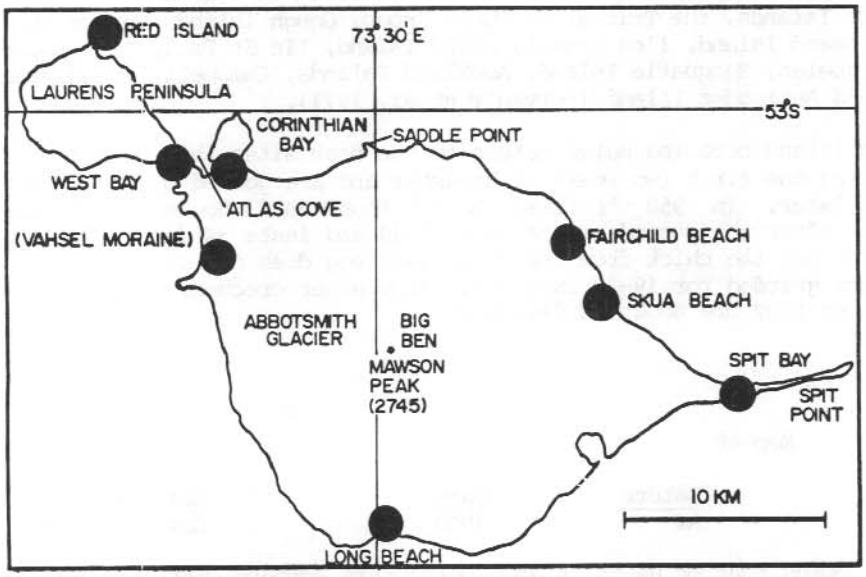
WEST BAY Map 48

Count	Nature	Date	Reference
Hundreds	A4	1950	Downes (1959)

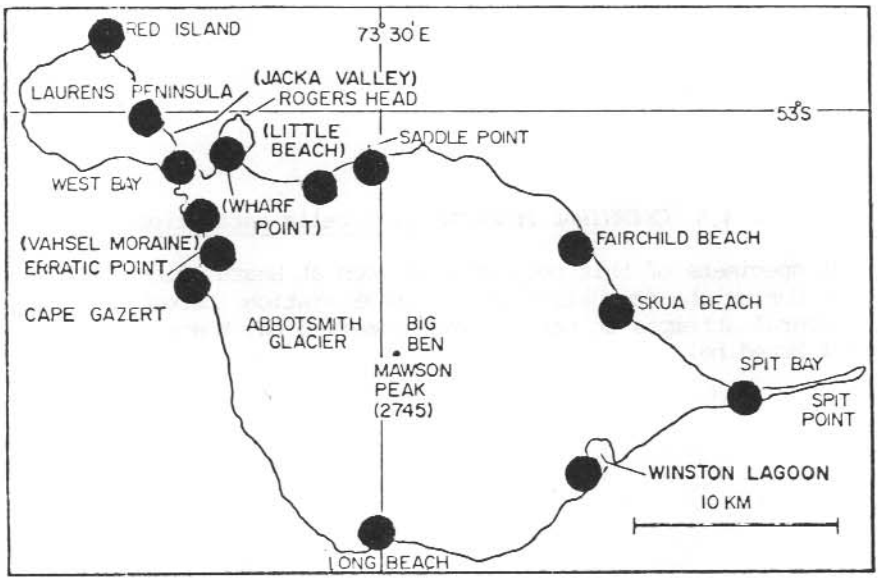
Downes records that on Heard Island Rockhoppers compete with Macaronis for rookery sites and for the most part, the distribution of the two species is identical. However, nowhere are their numbers very great and their total population is only a small fraction of that of the Macaronis.

4.5 CHINSTRAP PENGUIN (Pygoscelis antarctica)

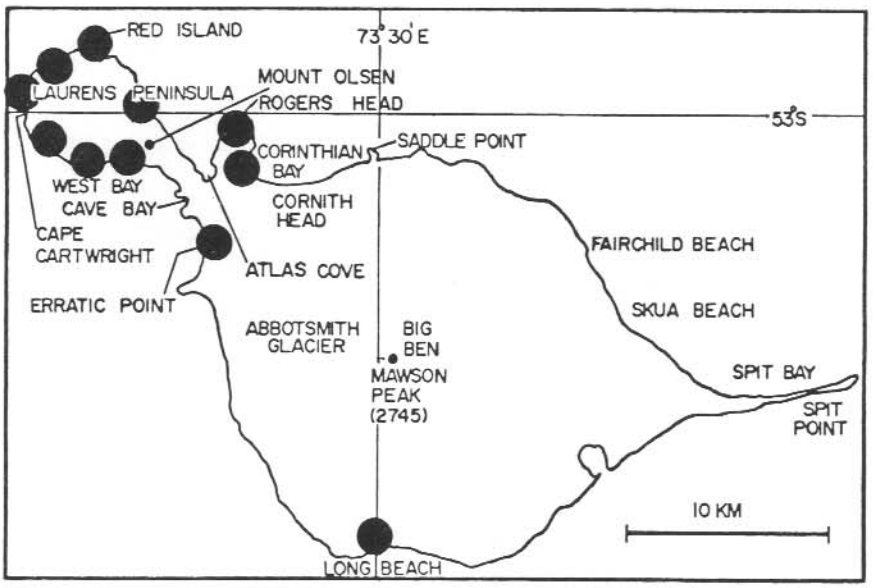
Occasional specimens of this penguin were seen at Heard Island in the summer of every year during the occupation of the ANARE station (December 1947 to March 1955). Several attempts at nesting were observed but there is no evidence of successful breeding.



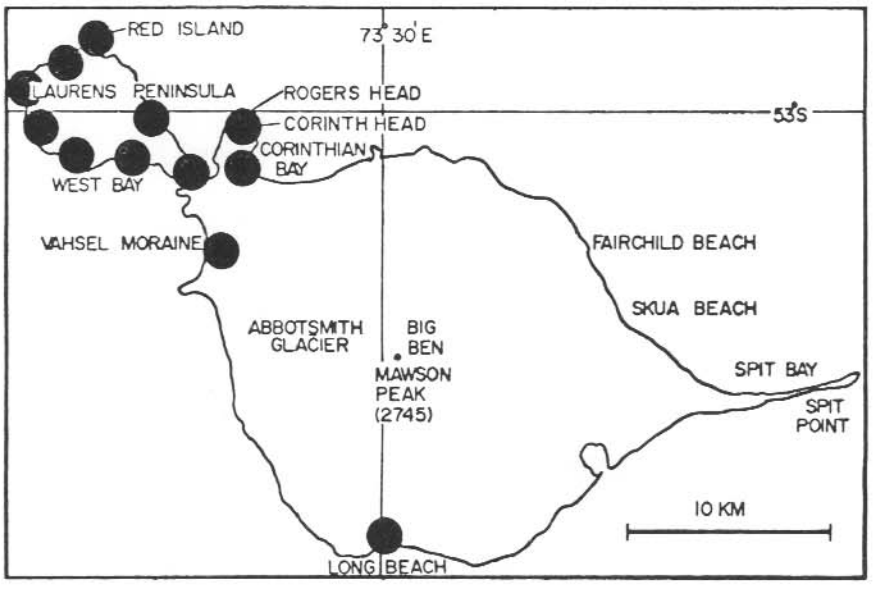
Map 45. Heard Island King Penguin colonies.



Map 46. Heard Island Gentoo Penguin colonies.



Map 47. Heard Island Macaroni Penguin colonies.



Map 48. Heard Island Rockhopper Penguin colonies.

5. McDONALD ISLANDS

5.1 MACARONI PENGUIN (Eudyptes chrysolophus)

By far the most numerous bird is the Macaroni Penguin which occupies the southern half of Flat Island, all the northern promontory of McDonald Island, the south-east coast and hinterland of the plateau, much of the summit and northern slopes of the hill, and the eastern part of the isthmus between the hill and the plateau. Small colonies also occur along the eastern beaches under the plateau cliffs (Budd, 1972).

The following counts are estimates of the total number of individual adult birds, estimated from the area occupied by penguins.

McDONALD ISLAND 53°02'S, 72°36'E Map 49

Count	Nature	Date	Reference
(A) 420000	A4	3.80	ANARE (Johnstone)
(B) 1210000	A4	3.80	ANARE (Johnstone)
(C) 365000	A4	3.80	ANARE (Johnstone)
(D) 30000	A4	3.80	ANARE (Johnstone)
(E) 285000	A4	3.80	ANARE (Johnstone)

FLAT ISLAND 53°02'S, 72°36'E Map 49

Count	Nature	Date	Reference
110000	A4	3.80	ANARE (Johnstone)

5.2 ROCKHOPPER PENGUIN (Eudyptes chrysocome)

McDONALD ISLAND (Colony 1) Map 50

Count	Nature	Date	Reference
8 Chicks	C1	13.3.80	ANARE (Johnstone)
86 Adults	A1	13.3.80	ANARE (Johnstone)

McDONALD ISLAND (Colony 2) Map 50

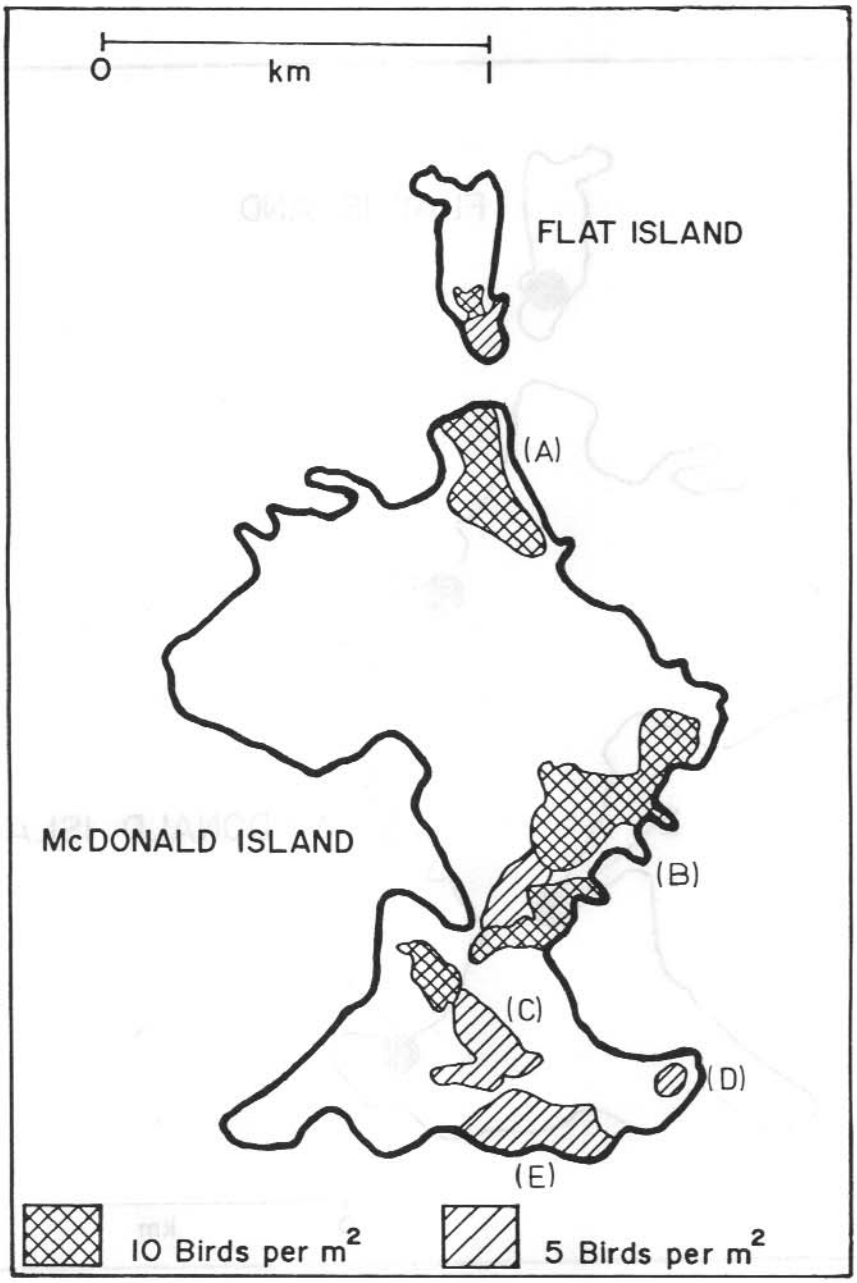
Count	Nature	Date	Reference
3 Adults	A1	13.3.80	ANARE (Johnstone)

McDONALD ISLAND (Colony 3) Map 50

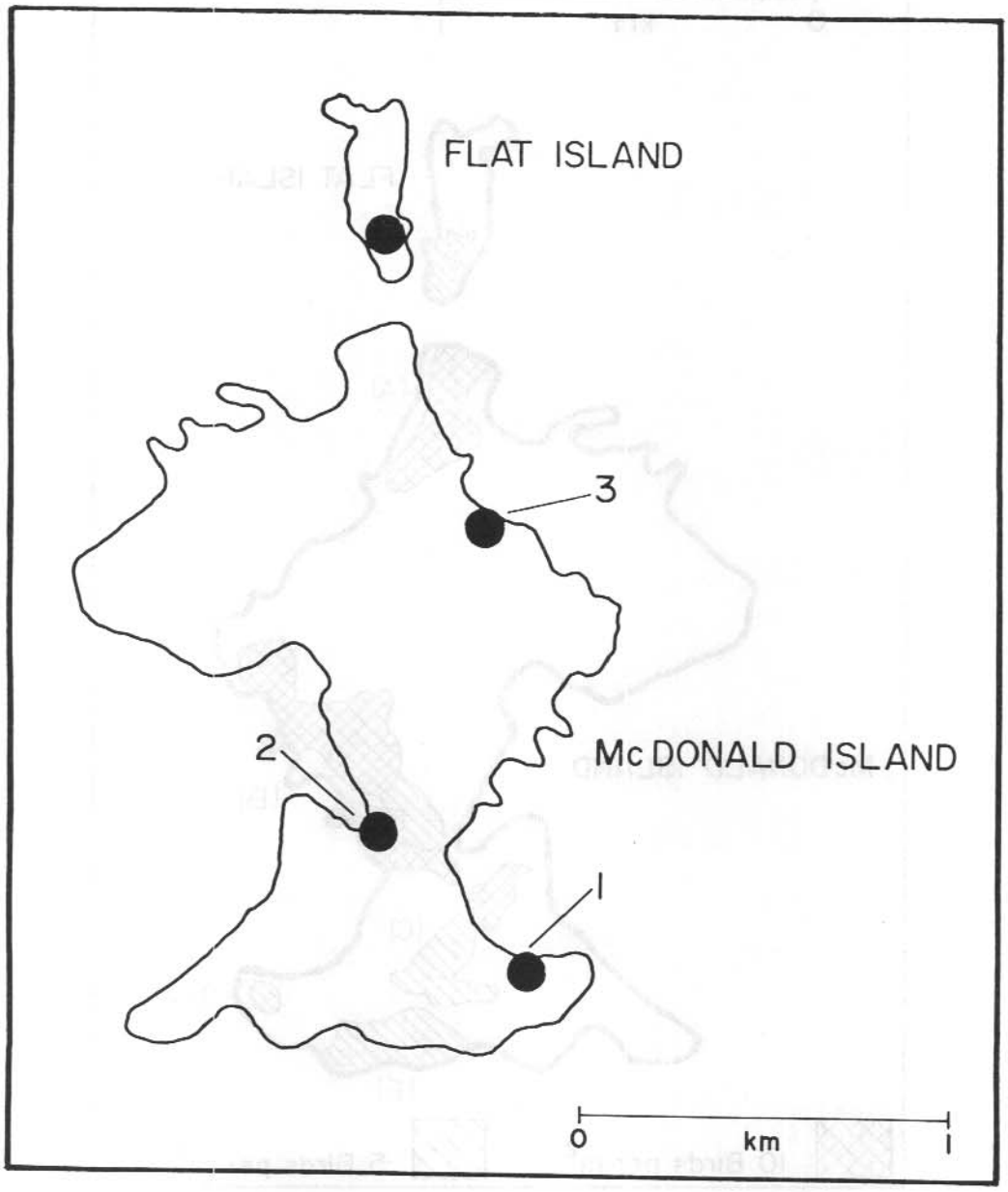
Count	Nature	Date	Reference
2 Chicks	C1	12.3.80	ANARE (Johnstone)
1 Adult	A1	12.3.80	ANARE (Johnstone)

FLAT ISLAND Map 50

Count	Nature	Date	Reference
1 Adult	A1	11.3.80	ANARE (Johnstone)



Map 49. McDonald Islands Macaroni Penguin colonies and population densities.



Map 50. McDonald Islands Rockhopper Penguin colonies.

6. MACQUARIE ISLAND

6.1 KING PENGUIN (Aptenodytes patagonica)

LUSITANIA BAY Map 51

Count	Nature	Date	Reference
3000	A4	1911	Conroy & White (1973)
600	C1	2.12.30	Falla (1937)
2630	C1	17.8.49	ANARE (Gwynn)
4550	C1	5.10.53	ANARE (Sturrock)
9030	C1	25.8.60	Rounsevell/Copson (1982)
22860	C1	19.8.76	Rounsevell/Copson (1982)
41454	C1	5.8.78	Rounsevell/Copson (1982)
46595	C1	8.8.80	Rounsevell/Copson (1982)

SANDY BAY Map 51

Colonisation began here in 1975 and chick numbers are being monitored annually. Numbers are presently around 100-300 breeding pairs.

6.2 GENTOO PENGUIN (Pygoscelis papua)

AERIAL COVE and SECLUDED BEACH Map 52

Count	Nature	Date	Reference
150	N2	1949	ANARE (Gwynn)

BUCKLES BAY Map 52

Count	Nature	Date	Reference
144	A1	29.3.67	ANARE (Ormay)

GADGET GULLY Map 52

Count	Nature	Date	Reference
100	N2	1949	ANARE (Gwynn)

MIDDLE BEACH Map 52

Count	Nature	Date	Reference
100	N2	1949	ANARE (Gwynn)

NUGGETS POINT and SANDY BAY Map 52

Count	Nature	Date	Reference
500	A2	1949	ANARE (Gwynn)
69	A1	29.3.67	ANARE (Ormay)

SOUTH EAST BAY Map 52

Count	Nature	Date	Reference
1500	A3	8.5.70	ANARE (Johnstone)

MAWSON POINT Map 52

Count	Nature	Date	Reference
81	N1	26.9.63	ANARE

BAUER BAY Map 52

Count	Nature	Date	Reference
67	A1	9.10.64	ANARE

LANGDON BAY Map 52

Count	Nature	Date	Reference
310	A1	25.3.67	ANARE (Ormay)

EAGLE POINT Map 52

Count	Nature	Date	Reference
500	A3	1949	ANARE (Gwynn)

HALF MOON BAY Map 52

Count	Nature	Date	Reference
136	A1	25.3.67	ANARE (Ormay)

HANDSPIKE POINT Map 52

Count	Nature	Date	Reference
300	N2	1949	ANARE (Gwynn)
137	A1	25.3.67	ANARE (Ormay)

HASSELBOROUGH BAY Map 52

Count	Nature	Date	Reference
300	C4	1930	Falla (1937)
150	N2	1949	ANARE (Gwynn)

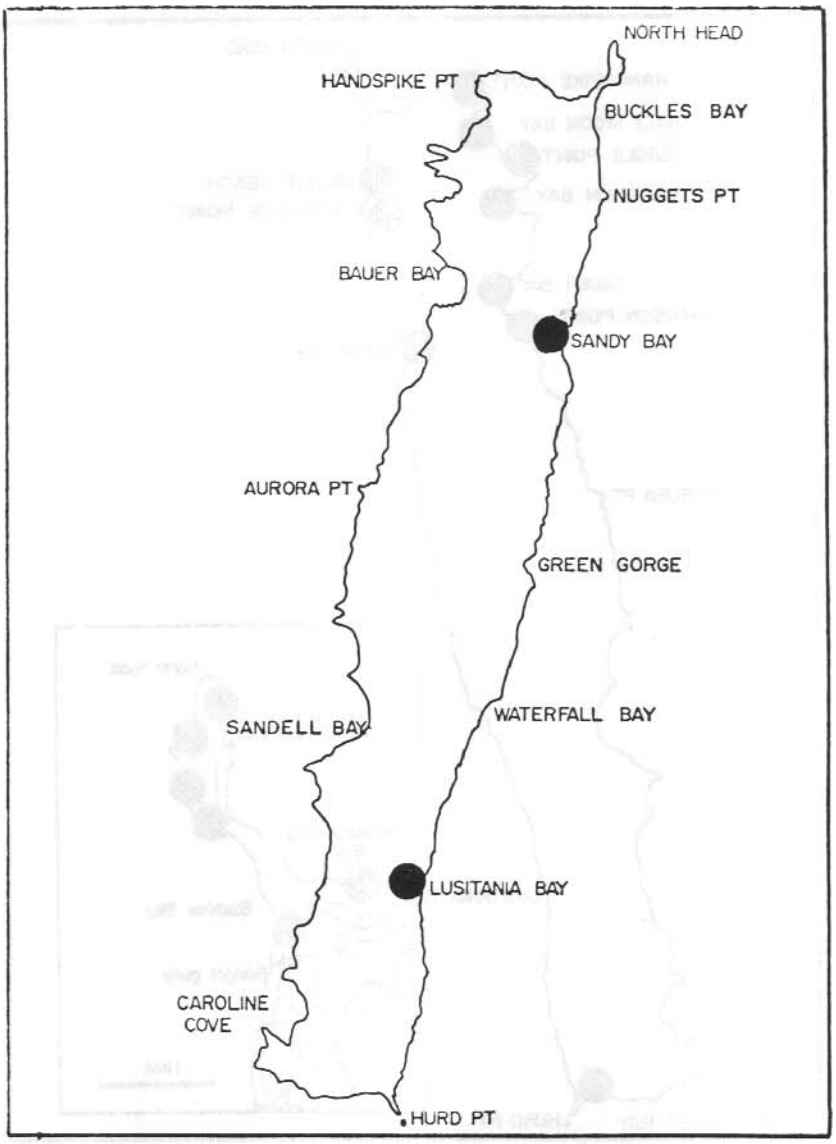
6.3 ROYAL PENGUIN (Eudyptes schegeli)

The Royal Penguin breeds only at Macquarie Island and is now considered a separate species rather than a sub-species of the more widely distributed Macaroni penguin. Royal and Macaroni Penguins are very similar, the most notable difference being the face and throat colour which is usually white in the Royal and dark in the Macaroni.

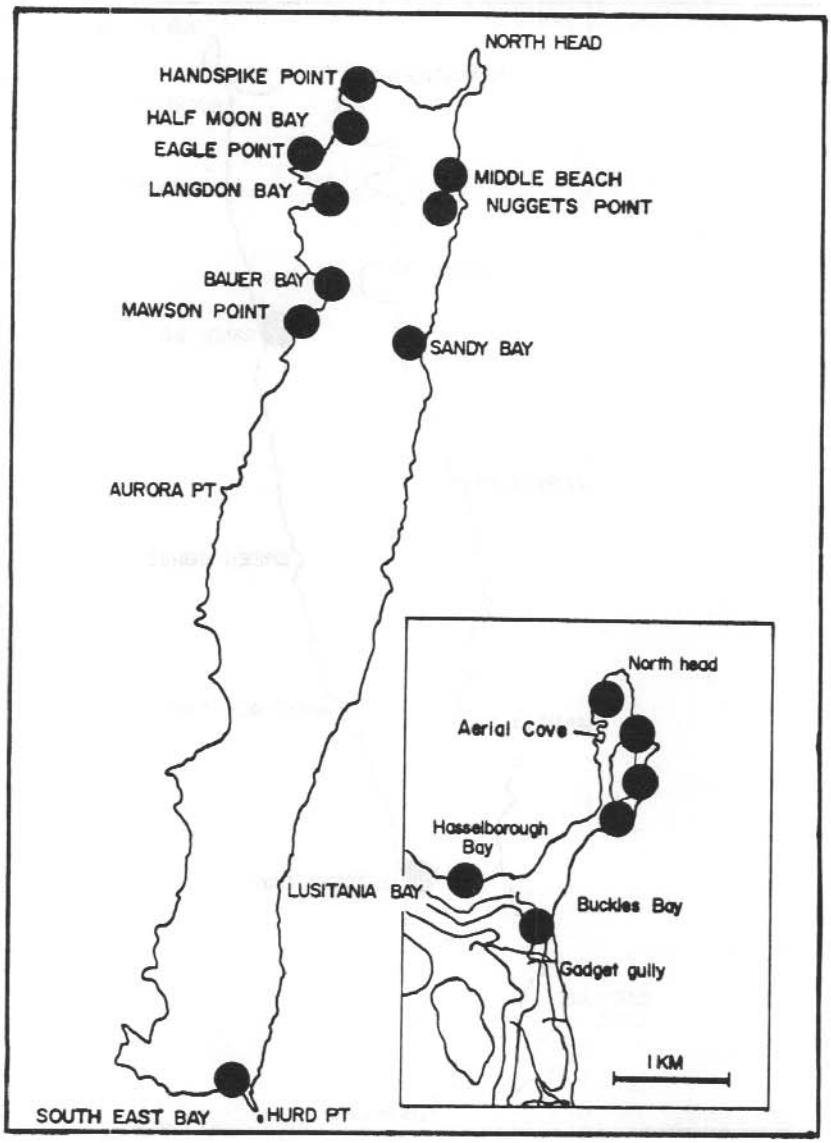
Royal Penguins breed along the coast of Macquarie Island in about 48 colonies (Map 53). The largest colony, at Hurd Point, has been estimated to contain between 250 000 and 4 000 000 breeding pairs. Aerial photography is presently being carried out to map areas of colonies and thus provide population estimates.

6.4 ROCKHOPPER PENGUIN (Eudyptes chrysocome)

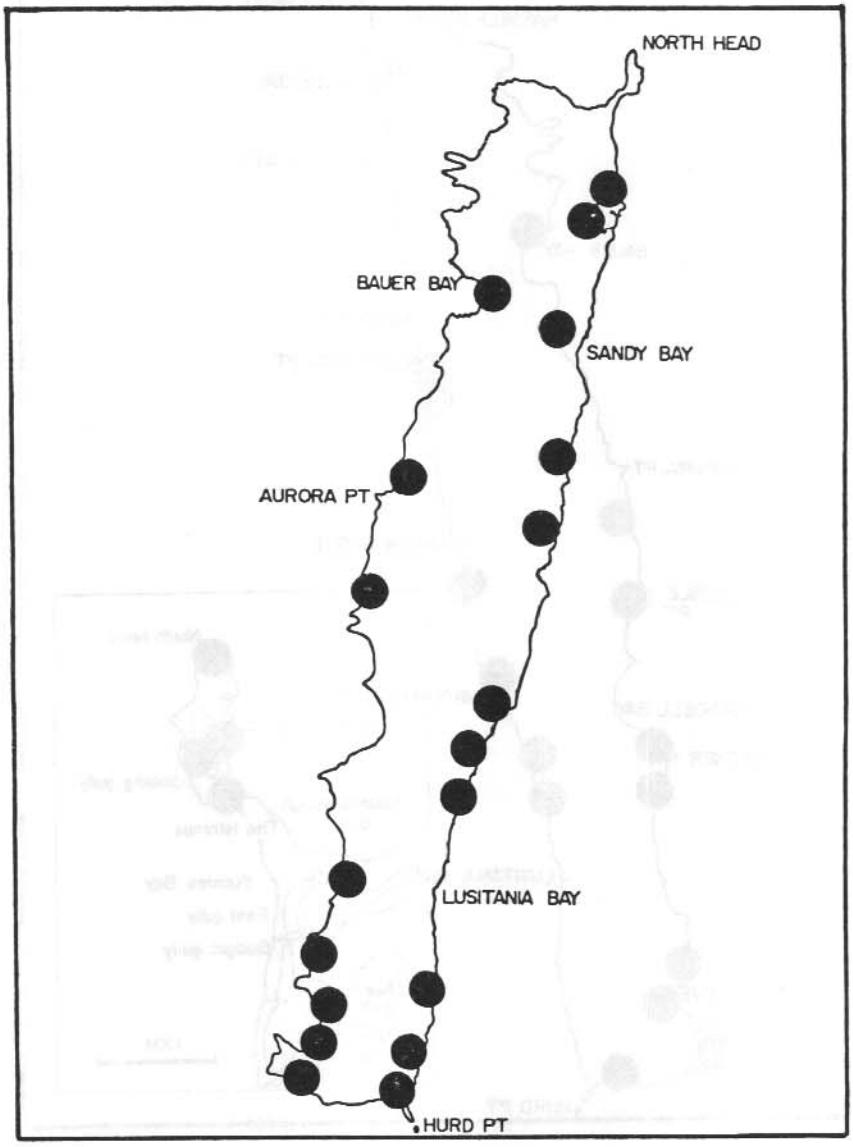
Large colonies of Rockhoppers are found mainly on the rocky west coast. It is difficult to estimate the island's total population but it must be of the order of some hundreds of thousands of birds. Many of the colonies overlap with those of Royals and as the birds nest amongst boulders and tussocks counting is very difficult (Map 54).



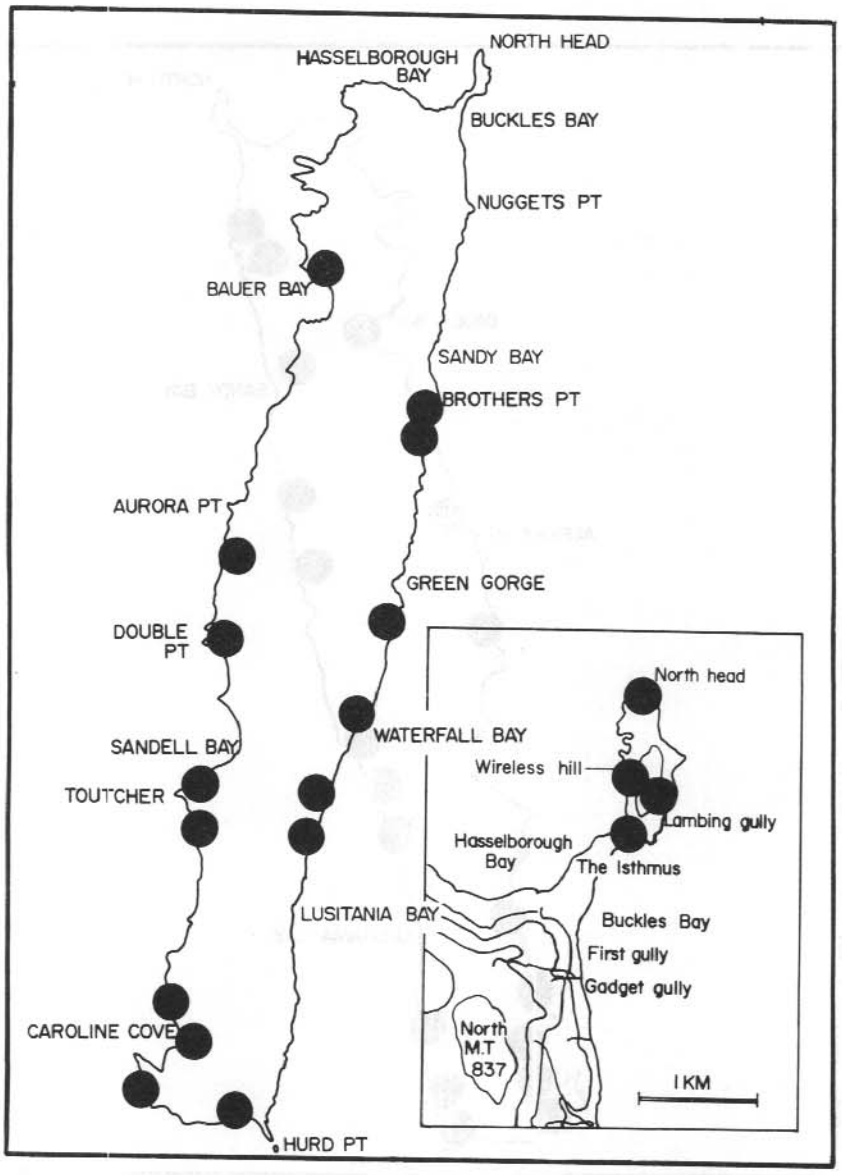
Map 51. Macquarie Island King Penguin colonies.



Map 52. Macquarie Island Gentoo Penguin colonies.



Map 53. Macquarie Island Royal Penguin colonies.



Map 54. Macquarie Island Rockhopper Penguin colonies.

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