AGE-RELATED SPATIAL DISTRIBUTION OF ADELIE PENGUINS

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ABSTRACT

During the period 20-21 December 1972 while travelling from Wellington, New Zealand, to Hallett Station, Antarctica, observations were made on the spatial distribution of Adelie Penguin age groups. It was found that during this period one-year-old birds were found at a noticeably greater distance from an established breeding rookery than were the birds two years old or older.

INTRODUCTION

In January 1902, Edward Wilson observed that the summer range of young Adelie Penguins *(Pygoscelis adeliae)* extended noticeably farther north than that of adults (Murphy 1936). Even though this has been known since this time very little information exists on this phenomenon in spite of the fact that many scientific parties have traversed the antarctic waters in recent years. The purpose of this paper is to report on observations relating to this subject taken while I was on board the USCGC *Glacier* from 15-21 December 1972 traveling from Wellington, New Zealand, to Hallet Station, Antarctica.

Material and Methods:

All observations were taken on 20-21 December 1972 starting at 67° 04′ S, 176° 56′ E and continuing until 72° 02′ S, 171° 18′ E when it became necessary to cease observations to prepare for departure to Hallett Station. Birds were aged on the basis of presence or absence of a white throat. Juvenile Adelie Penguins have a white throat until about 14 months of age at which time the white throat feathers are replaced by black feathers when they moult (Sladen 1955). The throat is then black throughout the remainder of the bird's life. Thus, by this technique birds could be placed into two age classes by field observations alone. In this paper I have used Class J to represent juvenile birds one year old, and Class A to represent sub-adults and adults two years old or greater with black throats.

All observations were carried out on the bridge of the icebreaker during six one-hour intervals throughout the day. A pair of 7 x 35 binoculars aided in identification, and all birds within sight that could accurately be assigned to an age class were counted.

A problem existed in interpretation of the data because at least two major Adelie Penguin rookeries are located in the immediate area (Watson et al. 1971). Since distance from the nearest established rookery was wanted for analysis, it was assumed that penguins from both Cape Adare and Cape Hallett could be seen and counted during

my observations. Thus, the distances recorded in Table 1 represent distances from the point of observation to the nearest Adelie Penguin rookery (either Cape Adare or Cape Hallett).

RESULTS AND DISCUSSION

As can be seen by examination of the data in Table 1 the younger age class of Adelie Penguins was found predominately at a greater distance from the nearest breeding rookery than was the older age group. The first penguins seen were sighted on 20 December at a distance of about 500 km from Cape Adare. These were all juvenile birds of Class J. Observations continued with only Class J birds being seen until about 200 km out except for two black-throated individuals seen at a distance of 473 km from Cape Adare. From about 200-120 km from the nearest rookery was a transition zone where groups of both Classes J and A were seen. At distances of

Table 1. The relationship between the number of Adelie Penguins seen and distances from the nearest rookery.

Distance from Rookery (km)[1]	No. in Class J[1]	No. in Class A[1]
500	3	
491	2	
473	2	2
464	2	
455	1	
431	1	
417	3	
400	1	
373	6	
364	5	
349	3	
318	1	
291	4	
278	14	
220	3	
198	2	
187	2	2
182	2	5
136		1
133	3	
124		8
122	4	
118	2	4
116		12
113		4
111		2
109		17
107		8
105		23
101		41

[1]See text for explanation of terms

less than 120 km from a rookery mostly birds of Class A were seen. For the purpose of simplicity observations in Table 1 were discontinued at 100 km from Cape Hallett when it became apparent that few Class J birds were being seen. At distances of less than 100 km well over 500 individuals were observed with all belonging in Class A except for three individuals. The difference between means of the data for both age classes presented in Table 1 was compared by use of a Student's t-test (Steel & Torrie 1960) and found to be highly significant ($P<.01$).

Not enough is known about the oceanic distribution of the Adelie Penguin to make many conclusions from my data. However, several conclusions are readily apparent. LeResche & Sladen (1970) state that very few of the one-year-old birds return to the rookery to establish territories or moult. On the other hand, many sub-adults of ages two or greater return to establish territories and moult even though few actually breed until four or more years of age. These sub-adults and other breeding adults arrive at the rookery during October and November. Thus, it seems reasonable that these older birds with stronger reproductive ties with the rookery would be found closer to the breeding area during the summer season, while the juvenile birds would range a greater distance out to sea. Since only two individuals of Class A were observed at distances greater than 200 km from an established rookery, it is probably safe to assume that these birds and many of the other Class A birds in the perimeter areas were non-breeding birds also. This aspect of the natural history of the Adelie Penguin is certainly of interest and should be further studied in different areas and at different seasons.

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