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A note on winter seal observations in the South Atlantic pack ice

M.N. Bester

Mammal Research Institute,
University of Pretoria, Pretoria 0002

*A winter survey of seals in the marginal zone of the South Atlantic pack ice was carried out in July 1979. An area of 126,1 km² was surveyed from the S.A. Agulhas, and only crabeater seals *Lobodon carcinophagus* and Kerguelen fur seals *Arctocephalus gazella* were encountered, and in very low numbers.*

*'n Winter opname van robbe in die marginale gebied van die Suid-Atlantiese pakys is gedurende Julie 1979 uitgevoer. 'n Oppervlakte van 126,1 km² is vanaf die S.A. Agulhas gedek en slegs krapveterrobbe *Lobodon carcinophagus*, en Kerguelen pelsrobbe *Arctocephalus gazella* is in baie klein getalle teëgekome.*

Introduction

The winter cruise (08) of the *S.A. Agulhas* included a brief four-day penetration into the northern zone of the South Atlantic pack ice during July 1979. This brief survey was all that the ship's schedule allowed, and was made in order to obtain some idea of species distribution and density of Antarctic and sub-Antarctic seals in winter. Previous South African seal surveys in the Antarctic region had all been made in

summer during January and February (Hall-Martin 1974, Wilson 1975, Condy 1976 and 1977) when the pack ice had retreated far south.

Methods

Pack ice was first encountered at 50°39'S, 09°32'W and the ship came out of the pack ice at 55°58'S, 03°42'W. Positions of the ship's route through the ice during the survey period are shown in Table 1. Observations were made from the ship's bridge 15 m above sea level and were conducted from 10h00 GMT on 27 July 1979 to 16h30 GMT on 30 July 1979. Observations were interrupted when the ship was stationary alongside icebergs while experiments were carried out by representatives of IFF (Icebergs For the Future) and during periods of poor visibility. During daylight steaming periods seals were censused using the same techniques of the previous surveys (strip width was 200 m either side of the ship) which were based on the technique described by Siniff, Cline and Erickson (1970). Ice cover (in tenths), floe size and floe surface nature (Hall-Martin 1974) were recorded at 20 minute intervals, and ship's position was monitored constantly by satellite navigation.

Table 1
Cruise tracks during survey periods in the South Atlantic pack ice.

Strip No.	Date	Time	Starting position	Finishing position	Crabeater Seals
1	27/7/79	14h00—16h10	57°23'S, 09°11'W	57°39'S, 08°31'W	2
2	28/7/79	08h10—10h00	58°02'S, 07°52'W	58°06'S, 07°36'W	0
3	28/7/79	13h00—17h00	58°05'S, 07°36'W	57°29'S, 07°21'W	0
4	29/7/79	10h20—14h00	57°02'S, 06°37'W	57°24'S, 06°00'W	1
5	29/7/79	14h00—16h20	57°24'S, 06°00'W	57°21'S, 05°19'W	0
6	30/7/79	08h00—09h00	57°04'S, 06°44'W	57°10'S, 03°38'W	0
7	30/7/79	09h00—12h50	57°10'S, 03°38'W	56°37'S, 03°35'W	0

Results and Discussion

An area of 126,1 km² was surveyed, and mean pack ice concentration was $0,75 \pm 0,18$ ($n=64$). Only three solitary crabeater seals (*Lobodon carcinophagus*) were seen, with a density of 0,02 per km². They were found between 100 km and 140 km from the edge of the pack ice on small (<100 m²) smooth ice floes in areas with 0,9 pack ice concentration, between 12h20 GMT and 15h40 GMT.

The very low density of crabeater seals (the most numerous of Antarctic phocids) and the apparent absence of other Antarctic seal species, were probably the result of increased ice coverage during winter (26×10^6 km² versus 2,6 to $3,2 \times 10^6$ km² in summer; Mackintosh & Brown 1953) over which the seals could disperse. Eklund and Atwood (1962) also noticed an inverse relationship between pack ice width and seal densities.

Øritsland (1970) found seals at a considerably higher density (0,12 per km²) during the period late August to October in the south-western Atlantic pack ice, with seals concentrated within 9 km from the ice-edge (and very few seals occurring farther into the pack ice) when the edge was compacted, and the pack ice very close. This may have been due to a local food abundance and difficult access to food resources further away from the ice-edge, and/or to sociological factors relating to the approach of the breeding season. During this survey, which occurred closer to mid-winter, the three seals (*L. carcinophagus*) observed were widely scattered and occurred further into the pack ice.

Two groups of Kerguelen fur seals (*Arctocephalus gazella*) of respectively two and three animals per group were found on separate small, smooth ice floes approximately 200 m apart. Pack ice concentration was 0,8 and the seals were approximately 45 km south of the ice front at 56°22'S, 03°32'W on 30 July at 14h15 GMT. Only an adult male could be positively aged and sexed, the remaining four were thought to be adult females and/or subadult males. They occurred within the latitudinal belt of Antarctic islands where they breed during summer. These individuals were approximately 236 km, 1390 km and 2042 km from the nearest breeding grounds of Bouvetøya (54°24'S, 03°25'E), the South Sandwich Islands (approximately 54°24'S, 26°20'W) and South Georgia (54°17'S, 36°30'W) respectively, and within the zone of dense *Euphausia superba* concentration (Marr 1962), their

main food species. With *A. gazella* dispersing from their breeding grounds during the 6 to 7 months of winter and Payne (1979) suggesting a general northward (or westward from South Georgia) movement, the present first record of *A. gazella* in the Antarctic pack ice however suggests that they remain south of the Antarctic Convergence during winter, although this may involve dispersal to considerable distances from their breeding grounds.

Acknowledgements

SASCAR and the Department of Transport are thanked for financial and logistical support, and Captain W. Leith and officers of the *S.A. Agulhas* for their co-operation.

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