

BREEDING ACTIVITY OF ANTARCTIC FUR SEALS (*Arctocephalus gazella*) AT ELEPHANT IS., SOUTH SHETLANDS, ANTARCTICA.

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Introduction

Historically, there had been extensive colonies of Antarctic fur seals (*Arctocephalus gazella*) throughout the Southern Ocean, including the South Shetlands. However, Antarctic fur seal breeding colonies in this area has virtually disappeared after the mid-1820s with the onset of commercial exploitation. Thus, AFSs were not observed again in the South Shetland Islands until 1958, when a small colony was discovered at Cape Shirreff, Livingston Island, which now represents the largest breeding fur seal colony in the South Shetlands. There have been no records of AFS breeding activity at Elephant Is. recently.

Antarctic fur seals (AFS) are amongst the most widely studied marine predators in terms of life history and foraging ecology. Most of these studies were carried out only over the past 5 decades given that up to 1950 AFSs were subjected to intense commercial harvest. The removal of seals was so drastic that some populations declined to a point where research activities could not be efficiently undertaken. Nevertheless, at present, several aspects of the biology and foraging ecology of AFSs have been studied across their distribution range in the Southern Ocean, from South Georgia all around to Macquarie Island and back to the South Shetlands and South Orkneys. These studies revealed great flexibility both in prey choice and foraging strategies, as well as the ability of coping with environmental variability. Since female Antarctic fur seals are limited by the fasting capabilities of their pups in the extent to which they may explore foraging grounds, differences in female foraging trip duration are likely to reflect foraging activity and prey distribution and abundance. Furthermore, individual differences in trip duration are also likely to indicate different foraging strategies.

In 1997, a small group of AFS was reported breeding at Stinker Point, Elephant Is. Since then, number of Antarctic fur seals present at Elephant Island during the austral summer has been increasing and the presence of breeding males and females has been confirmed.

Objectives

The present study aims to describe the general pattern of occurrence of AFSs at Stinker Pt.; to describe their breeding activities; to count the number of individuals involved in breeding activities; and, to report information on the foraging cycle (duration of foraging trips) and pup growth during the first six-weeks after birth in 2004-2005.

Methods

This study was carried out at Stinker Pt., Elephant Is. In the summers of 1997/1998, 1998/1999, 2003/2004 and 2004/2005 surveys conducted throughout the study period ensured that the number of Antarctic fur seal was recorded such that the temporal and spatial distribution of individuals was known. In 2002/2003 two single counts of pinnipeds present in the study area were performed in mid December and early March. In 2004/2005, in addition to the census, all pups born in the study area were individually marked with hair-dye after birth. The mothers received corresponding marks whenever possible. By-daily surveys of marked individuals were then conducted. Pups were captured by hand, placed on a small capture bag and weighed to the nearest 0,1kg using a digital scale shortly after female departures and arrivals from

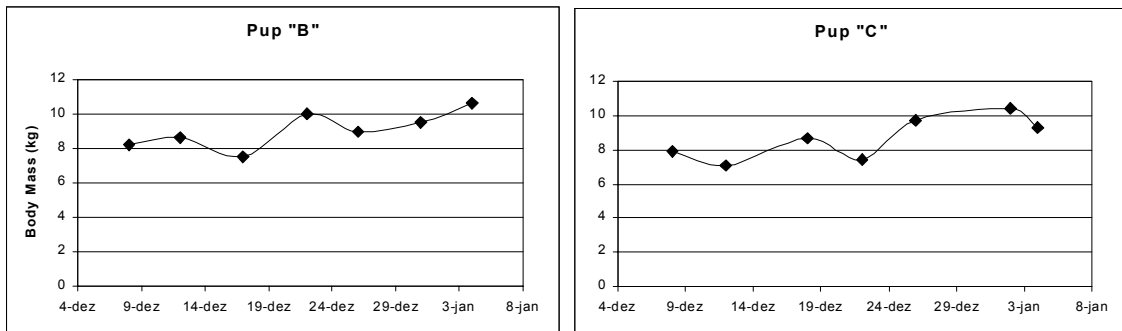
foraging trips. Initial pup weights were obtained no later than a week after birth (3/10 pups) and/or within a day of being born (7/10 pups).

Results

There was an increase in the number of Antarctic fur seals sighted over the years along the study area. These numbers included breeding and non-breeding individuals. The general pattern of fur seal presence at Elephant Is. agrees with what has been reported for other areas. Individuals start to arrive at the study area by mid-November (mostly males). Females arrive by late November and give birth within three to four days upon arrival. Later in the summer the number of adult males and juveniles increase.

In 1997 the maximum number of Antarctic fur seals counted at one given time was 11 seals. In 2002, 15 individuals (6 adult males, 5 females and 4 pups) were counted in early December. This number went up to 25 individuals by mid December in 2004/05 and 40 by early January. Of these individuals, 60 % (n=24) represented a breeding group composed of one adult male, 12 females and 11 pups. The only observation for late summer was obtained through a single census in early March of 2003 when a total of 250 individuals were counted, including the 5 females and 4 pups reported for Dec. of the same season.

In 2004/2005 a breeding group was monitored for about eight weeks. Most pups had already been born by mid-December and the last pup was born Dec. 27, 2004. Females were followed individually from 4 to 27 days after the onset of foraging. During this time, females had on average $2,5 \pm 0,76$ foraging trips (1 to 4) with an average duration of $7,4 \pm 2,3$ d (2 to 13 days) while pup daily growth rates ranged from 0,1 to 0,5 kg per day ($0,1 \pm 0,08$ kg/d – Figure 1). Two copulations were witnessed and several males challenged the breeding male. However none of the attempts were successful. An additional breeding group (1 M, 2 F and 2 P) was spotted outside the study area but were not included in this study.



Discussion

There has been an increase in the number of Antarctic fur seals present at Elephant Island during the austral summer. This increase in numbers is also accompanied by the establishment of a small breeding group in the area. The average duration of foraging trips reported for female AFSs in the present study are higher than average values reported for other breeding colonies. This may indicate that in 2004/2005 females had to travel far away in order to efficiently forage. It is important to continue monitoring these individuals over longer periods of time in order to establish whether there are interannual differences in foraging which may be attributed to differences in prey availability. On the other hand, differences in individual foraging patterns within years, might be attributed to differences in foraging strategies by individual females. Thus, Elephant Is. represents an interesting site to investigate ecological factors and genetic aspects of a small group of AFSs in light of potential environmental variability.

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