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OBSERVATIONS ON HAUL-OUT PATTERNS AND TRENDS IN THE BREEDING POPULATIONS OF SOUTHERN ELEPHANT SEAL AT PENINSULA VALDES (PATAGONIA) AND STRANGER POINT (25 DE MAYO - KING GEORGE I.)

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Abstract

Southern elephant seal, Mirounga leonina, populations at Península Valdés (Patagonia) and 25 de Mayo-King George I. were studied during the breeding season from 1979 to 1987. Two main objectives were taken into consideration : haul-out pattern and the female population trend. In both places, the intrinsic population growth rate is positive. In 1982, at Stranger Point, a sharp decrease of the female component of the population was observed (r=-56.54%). The recovery of the population at Stranger Point, and the global increase at Península Valdés, indicate the good condition of these populations.

Résumé

Les populations d'éléphants de mer du Sud, Mirounga leonina, à Península Valdés (Patagonie) et 25 de Mayo-Ile du Roi George ont été étudiées au cours de la saison de reproduction de 1979 à 1987. Deux objectifs principaux ont été considérés : les caractéristiques de la venue à terre et les tendances de la population femelle. A ces deux endroits, le taux intrinsèque de croissance démographique est positif. En 1982, à Stranger Point, une forte diminution de la composante femelle de la population a été observée (r=-56,54%). Le repeuplement à Stranger Point et l'augmentation globale à Península Valdés indiquent la bonne condition de ces populations.

Resumen

Se estudiaron poblaciones de elefante marino austral, Mirounga leonina en la Península de Valdés (Patagonia) y en 25 de Mayo - Isla King George, durante la estación reproductora desde 1979 hasta 1987. Se tomaron en consideración dos objetivos principales : el patrón de emergida y la tendencia de la población de hembras. En ambos lugares, la tasa intrínseca de crecimiento de la población es positiva. Se observó en 1982, en Stranger Point, un brusco descenso del componente de hembras de la población (r=-56.54%). La recuperación de la población en Stranger Point, y el aumento global en la Península de Valdés, indican el buen estado de estas poblaciones.

Резюме

С 1979 по 1987 г. во время периода размножения проводились исследования популяций южного морского слона, Mirounga leonina, на полуострове Вальдес (Патагония) и на о-ве Кинг-Джордж. Внимание уделялось двум основным целям: изучению закономерностей в прибытии на лежбища и направления изменений в популяциях самок. Темп экспоненциального роста размера популяции - положительный в обоих местах. В 1982 г. на мысе Стрэнджер в популяции наблюдалось резкое уменьшение количества самок (r = -56,54%). Восстановление размеров популяции на мысе Стрэнджер и общее увеличение запасов на полуострове Вальдес указывают на то, что эти популяции - в хорошем состоянии.

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INTRODUCTION

Southern elephant seals, Mirounga leonina, breed on both sides of the Antarctic Convergence. Most of the breeding places are located on islands, except for the herd found on the coast of Península Valdés (Patagonia). The distribution of elephant seal breeding populations is circumpolar and they were recognized as three stocks : South Georgia, Kerguelen and Macquarie (Laws, 1960).

Population decrease was reported by several authors in different stocks : at Kerguelen (Skinner and van Aarde, 1983, Bester, 1982, Condy, 1979); at Macquarie (Burton et al., 1986). At South Georgia censuses were carried out in 1985-1986; the total population estimated was essentially the same as the abundance estimated from the 1951 survey (Croxall, 1986). It is possible that there could be more than one reason for this decrease. One reason could be the competition with fishing fleets since the onset of this decade and their possible influence on the reproductive success, and in the population trends (van Aarde, 1980).

In this paper we present information on the last seven years in two breeding places belonging to the Georgia stock. Two main objectives have been taken into consideration : haul-out pattern, and the female population trend. The first was considered to decide which method would be used in the population estimation of females from these two breeding places.

The second one was included because after the breeding season, females from Península Valdés go to the south (Scolaro 1976) and perhaps they could reach Antarctic waters where they would recover the weight lost during lactation (Vergani, 1986). Changes in food availability could be reflected in trends of the female component of these populations.

A first step in analysing this hypothesis was to compare an Antarctic population trend against a Patagonian one.

METHODS

Censuses were carried out in two different places. One of them was located at 25 de Mayo I. (King George) (1980-1986 except for 1981), where a study area of 5 km between Stranger and Elefante Point was fixed (62°14' S - 58°30' W). The other place was located at Península Valdés (Patagonia) (1981-1984). Censuses were carried out on 8 km of coastline; one isolated beach was determined to be representative of the original area and it was used every year to collect the information.

The maximum number of females at Stranger Point was calculated by females plus weaned and dead pups (McCann, 1985) and at Península Valdés a mathematical model as described by Lewis (in press) was used.

Estimates of intrinsic population growth rates were based on the exponential function : $N_t = N_o\ e^{rt}$ as suggested by Caughley (1977) like that of Skinner and van Aarde (1983).

RESULTS

Differences in time of females haul out were observed between Península Valdés and Stranger Point. Through the whole period of observations, the difference ranged between a minimum of 13 days and a maximum of 29. This variation reflects the different starting point of female arrival.

In Stranger Point the rank was 8/9 to 23/9 and at Península Valdés was 26/8 to 1/9. Similar differences were also found in the date of the peak of females ashore corresponding to 27/10, rank ± 3 to Stranger Point and to 30/9, rank ± 5 to Península Valdés.

Besides, the duration of the breeding season in Stranger Point was 10 days shorter (average) than Península Valdés. In both places it was independently observed, from year to year, the duration and the synchronization of the breeding season of cow haul out.

Differences between both populations may be observed in Figure 1.

In both places, the intrinsic population growth rate is positive (Figure 2). In 1982 in Stranger Point a sharp decrease of the female component of the population was observed ($\bar{r}$ = -56.54%). This fact could be related to some kind of disturbance of the austral ocean (e.g. "El Niño").

DISCUSSION

This paper shows that comparing both places the haul out pattern is different so their breeding seasons are not synchronic ones. If we wish to estimate the maximum number of females ashore on the basis of a single census, at Stranger Point this should be carried out after the 30/10 (27/10 plus the 3-days rank), and at Península Valdés after the 5/10 (30/9 plus 5-days rank). Here the weaning pups immigration from other areas would produce an overestimation of the female maximum number. That is why it was decided to use the model developed and used by Lewis (in press) in previous years to calculate Península Valdés population trends.

Migration between subantarctic and antarctic places after the breeding season have been confirmed with male of elephant seal from Kerguelen to Vestfold Hills (Burton, 1985).

In Patagonia, the number of females involved in the breeding season is greater than the number that goes there for moulting, while at Stranger Point exactly the opposite happens (Vergani, 1985). This fact would allow to speculate on a migration between subantarctic and antarctic places, but population trends do not show a sharp parallelism between them. At Península Valdés it did not happen the sharp decrease of the female component of the population that was observed at Stranger Point in 1982. Here, the most probable hypothesis is an "El Niño" (1982-1983) influence on the ecosystem. (This point will be dealt with in a future paper).

The recovering of the population at Stranger Point and the global increase at Península Valdés indicate the good conditions of these populations. The global increase at Península Valdés was obtained by comparing the total number of females of 1975 and 1982. The first was of 4 400 individuals, data obtained through transforming the number of pups censed by Scolaro (1976) in female number through the application of birth rate. The second was obtained through an aerial census carried out by Lewis (submitted to Marine Mammal Sciences) at the peak point of the breeding season, which rendered 6 400 individuals. The value of $\bar{r}$ between these two years is 0.05, similar to the one estimated for this population by McCann (1985) between 1971-1975.

Through the study of the diet and using directional and time depth recorders it could be proved the hypothesis of Patagonian females reaching Antarctic waters. On the other hand, the comparative study of population trends within the same stock will help achieve a better understanding of the factors affecting them.

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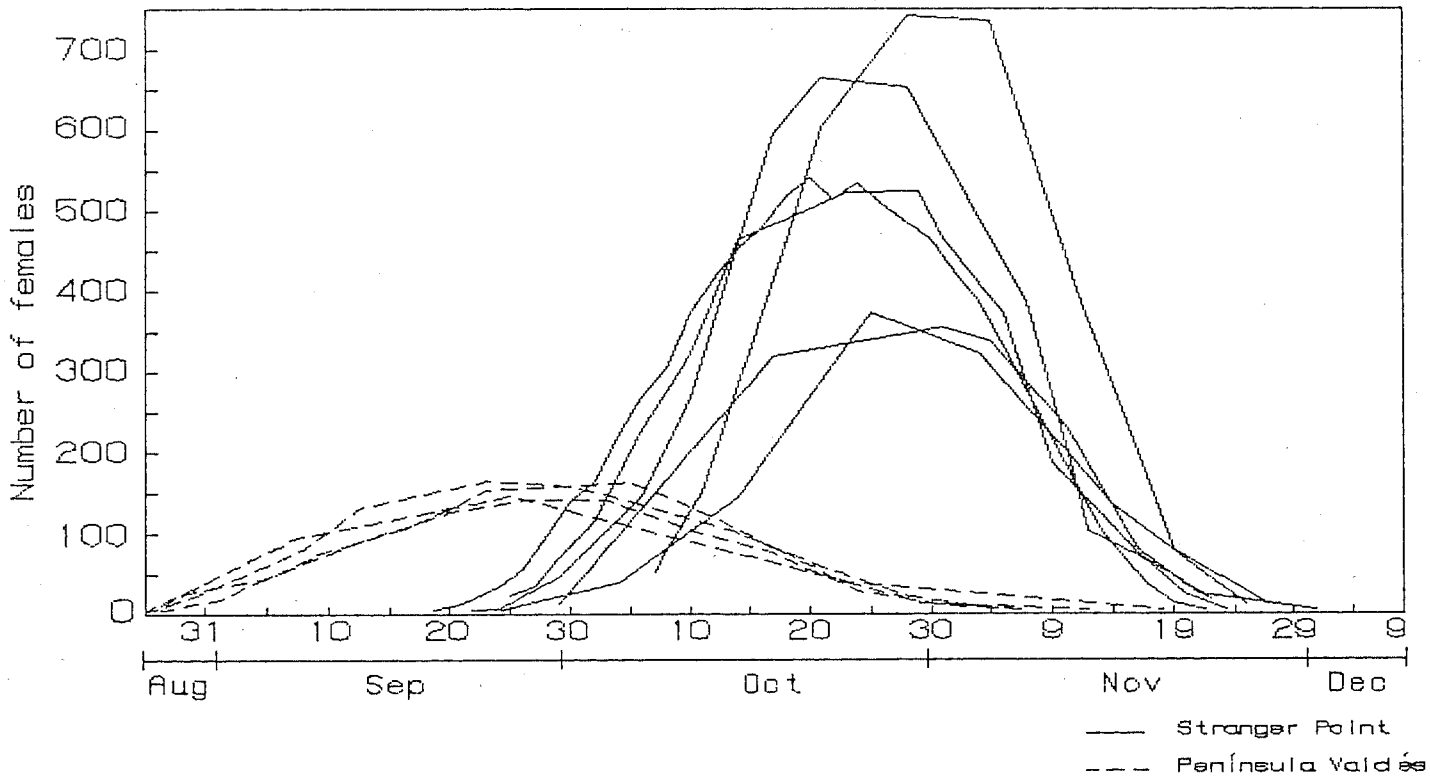

Figure 1 Fluctuations in the number of females during several breeding seasons at Stranger Point and Península Valdés.

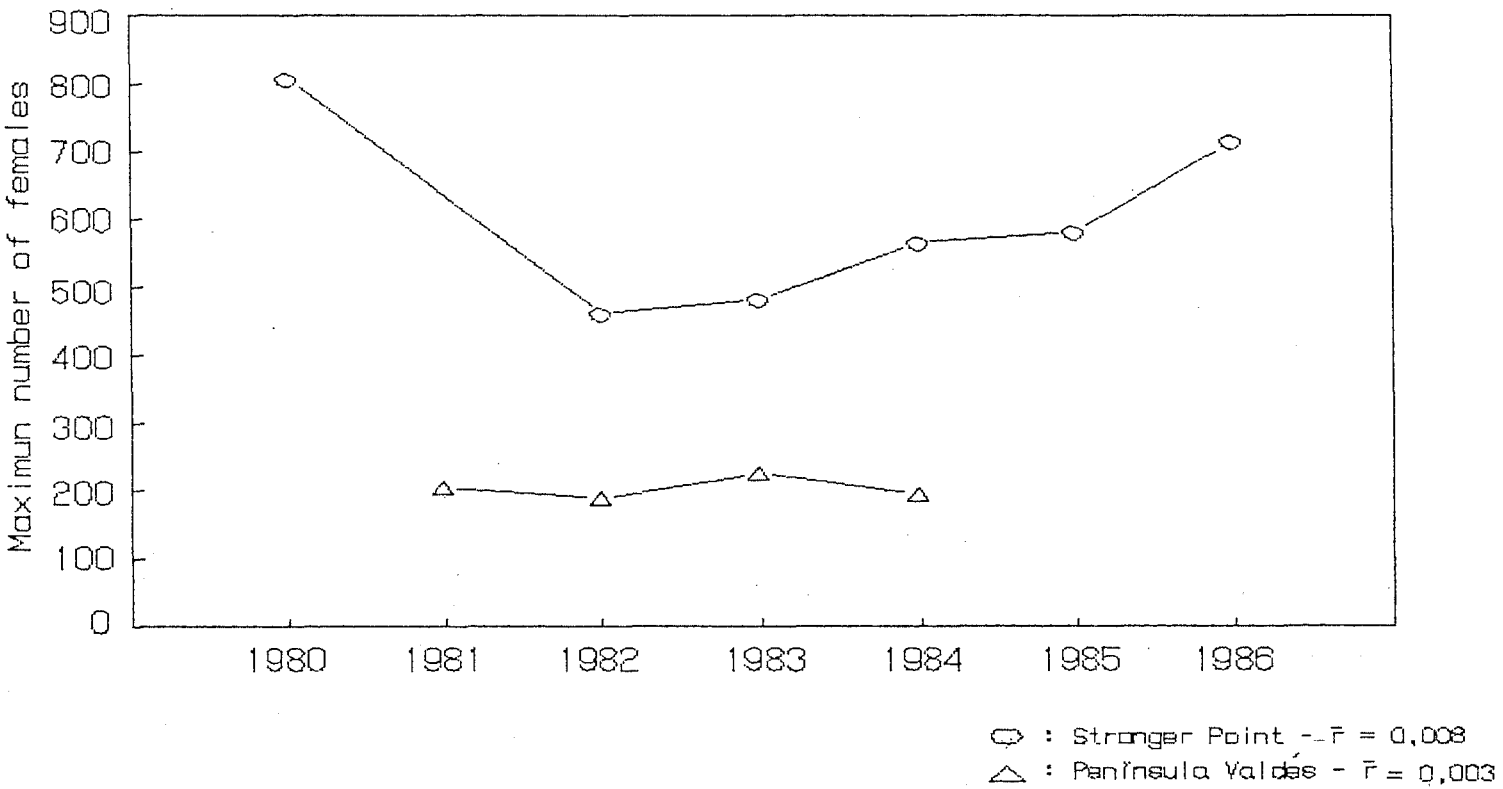

Figure 2 Trends in female component of southern elephant seal population.

Légendes des figures

Figure 1 Fluctuations du nombre des femelles au cours de plusieurs saisons de reproduction à Stranger Point et Península Valdés.

Figure 2 Tendances relatives à la composante femelle de la population d'éléphants de mer du Sud.

Leyendas de las Figuras

Figura 1 Fluctuaciones en el número de hembras durante varias temporadas de reproducción en Stranger Point y la Península de Valdés.

Figura 2 Tendencias en el componente de hembras en la población de elefantes marinos australes.

Подписи к рисункам

Рисунок 1 Изменения численности самок в течение нескольких периодов размножения на мысе Стрэнджер и полуострове Вальдес.

Рисунок 2 Направления изменений в численности самок популяции южного морского слона.