Evolution of pup production and pup mortality rate of the Mediterranean Monk Seal colony Cabo Blanco (Mauritania-Morocco) after a mass mortality episode

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INTRODUCTION

The **Mediterranean monk seal** (*Monachus monachus*), is one of the most endangered mammals of the world with no more than **500** individuals. The **Cabo Blanco peninsula** (Mauritania-Morocco) population is considered the largest aggregation and the only one that still keeps a colonial structure. Reproductive females use the narrow beaches of the interior of two caves to give birth and breed their pups. This habitat is considered suboptimal due to the high pup mortality detected, especially during the **bad sea conditions** (high swell, storms, etc.) season (**October-March**). Births are distributed all year long, although a peak is produced during autumn. In **1997**, the colony suffered a **mass mortality episode** that drastically reduced population size and pup production, putting in serious danger the survival of the colony. In this poster is exposed the results of the surveillance of pup productivity and mortality inside the colony from the last eleventh years.

Female with her juvenile pup

METHODS

The study area is located on the western coast of the Cabo Blanco peninsula (21º 02' N, 17º 03'W). A continuous monitoring of pup production and pup mortality has been performed from 1995 to 2006. The age of pups was estimated based on the different morphological categories established in previous studies (1). To detect individuals, a camera was used (plettac Fac-830W) with a video streaming server (Dallmeier Dis-1/S) with the aim of not disturbing the animals, or direct observation, when there was not enough visibility for using the camera. Pups were identified by the differences in their ventral patch designs (figure 1). The studied parameters were: **Annual Pup Production (APP),** as the number of pups per year. **Pup Mortality Rate (PMR)** as the number of death pups by the number of born pups. Three periods were considered in order to compare the PMR: 1) the mass mortality episode period (1995-1997), 2) the immediate post-mass mortality episode period (1998-2002) and 3) the period 2003-2006.

Figure 1. The ventral patch desing is different and exclusive for each animal

Direct observation of the inside of the cave. Top right, the camera

RESULTS

Figure 2. Evolution of the natality and mortality among the years of study

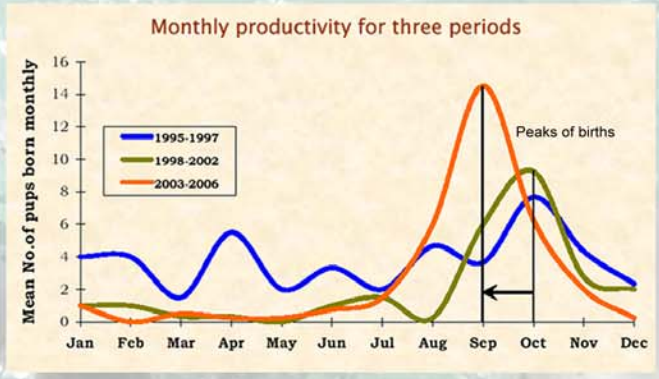

Figure 3. This figure shows the movement of the peak of births from October to September

Pup found dead on a beach

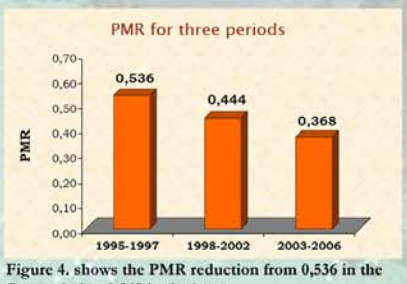

Figure 4. shows the PMR reduction from 0,536 in the first period to 0,368 in the latest.

From 1995 to 2006, were detected **356** pups from which **158** died or disappeared. Pup production was reduced notably in the second period if it is compared with the first (figure 2) and shows a progressive increase in the third one; from **56** pups in 1996 to **25** in 1998 and to **48** in 2006. It is remarkable the increase from 2005 to 2006: **65,52%**. We also detected an earliness of the peak of births when we compared the first and second period regarded to the third (figure 3). Based in our analysis, the **PMR** decrease detected in the third period (**0.368**) compared to the first (**0.536**) (figure 4), seems to be related to the earliness in time of the peak of births to a season with better sea conditions. Although the PMR in the bad sea conditions season (Oct-March) is still significantly higher respect to the good sea conditions one (Apr-Sep).

DISCUSSION

- Pup production has increase progressively in the last few years, approaching to the existing levels of the period before the mass massive mortality.
- The peak of births has been produced earlier in the last four years, moving from October to September.
- PMR has decreased probably associated to the earliness of the birth date, which now is produced in the months with good sea conditions.
- It is expected in future years, a progressive recovery of the Cabo Blanco monk seal colony to the pre-mass mortality episode (1997) levels.

Mother with her less than two months pup

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Monk seals inside one of the breeding caves

From left to right:
Luis Mariano González, Moulaye Haya, Hamdy M'Bareck, Pablo Fdez de Larrinoa, Ana Maroto y Mercedes Muñoz

The CBD-Habitat foundation is doing a close surveillance of population and biological parameters, and of the conservation status of the colony, within the framework of the Action Plan for the Monk Seal in the Eastern Atlantic of the Bonn Convention (CMS).

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