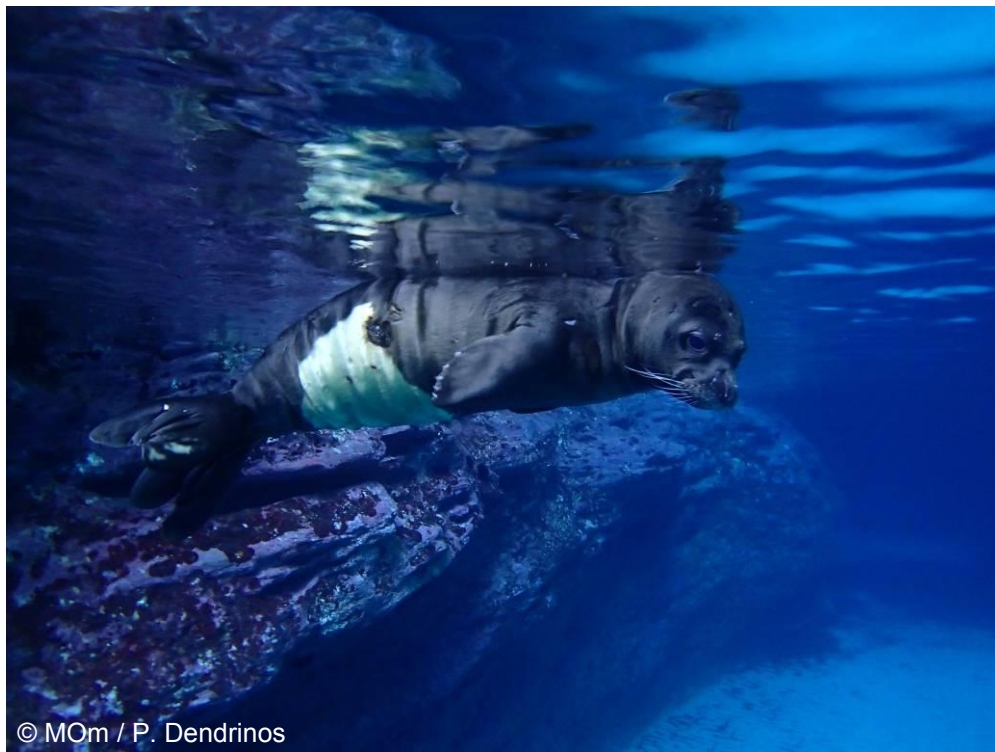




**1<sup>st</sup> Annual Conservation  
STATUS REPORT**  
OF THE MEDITERRANEAN MONK SEAL  
POPULATION  
AT THE ISLAND OF GYAROS

**EXECUTIVE SUMMARY**



*June 2014*

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## INTRODUCTION

The Mediterranean monk seal (*Monachus monachus*) is the rarest extant member of the Phocidae family and one of the rarest marine mammals in the world. It has been classified as “Critically Endangered” by the International Union for the Conservation of Nature (IUCN 2010) and is strictly protected by the Council of European Communities Directive 92/43/EEC, the Bonn, Bern, CITES, Barcelona and Rio Conventions, as well as by the Greek law.



**Figure 1** A Mediterranean monk seal pup at the island of Gyros, 2012

The present report has been prepared within the framework of the LIFE-Nature program: “CYCLADES Life: Integrated monk seal conservation of Northern Cyclades”. Although titled as the first annual report, it was considered important to include in this document all the scientific information on the Mediterranean monk seal that has been collected by MOM throughout the years (2002 – 2014) at the island of Gyros. This has been done so that the reader can obtain a more complete picture of the status of the species in the area. This report has been prepared with the aim of becoming the baseline for evaluating the trend of the status of the species during the project but also after it, in order to support effective management and conservation of the critically endangered Mediterranean monk seal.

## METHODOLOGY

The monitoring methodology applied in Gyaros island, included the operation of a Rescue and Information Network that provides information on monk seal presence, regular field surveys to evaluate habitat availability and suitability and record basic demographic parameters and the operation of a network of automatic cameras to identify individuals, record demographic parameters and study social and individual behaviour.



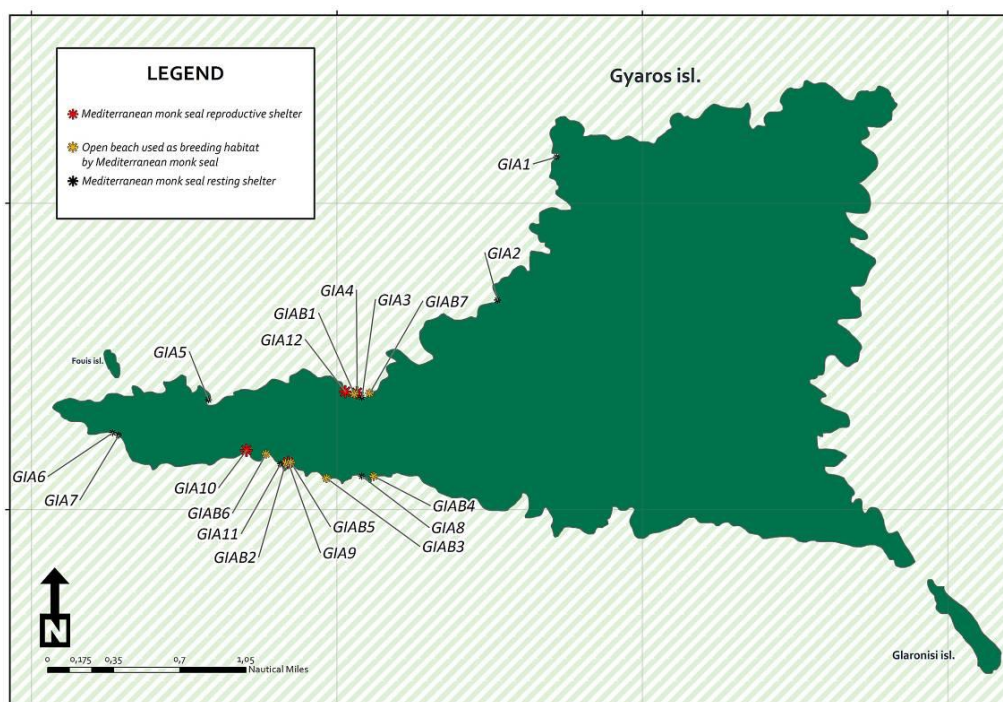
**Figure 2** Installation of infrared cameras at the island of Gyaros.

## RESULTS

The main results obtained so far:

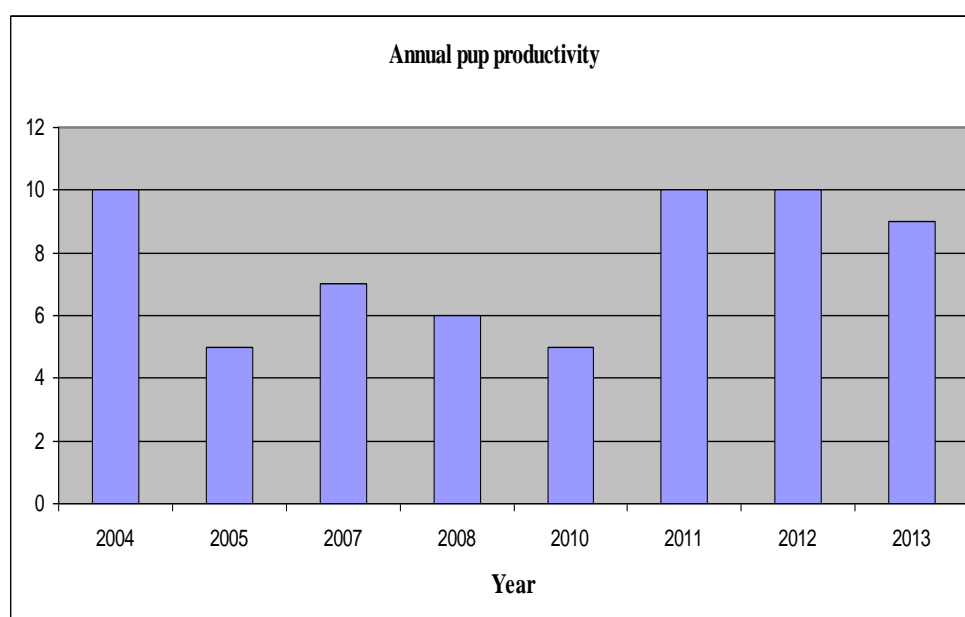
- Throughout the 37.05 km coastline of Gyaros twelve suitable coastal caves and 7 open beaches have been identified and evaluated as suitable for resting and pupping. Caves GIA4 and GIA10 in particular, possess morphological features that have led us to consider them ideal for pupping and resting.
- Use of open beaches for resting and possibly also for pupping was documented through direct observations on several occasions during field surveys; it has been possible to observe mothers and their pups and adult females and males interacting on open beaches on several occasions.





**Figure 3.** Distribution of the monk seal shelters at the island of Gyaros © MOm

Annual birth rate and pup mortality: The sexually dimorphic, highly distinctive and individually characteristic ventral patch of the pups, have enabled the identification of 62 different newborn pups at the island of Gyaros during the period 2004 – 2013. These values were used to calculate a mean value of 7.75 for the annual pup production across the monitoring years.



**Figure 4** Numbers of newborn pups recorded annually at the island of Gyaros (2004 - 2013).

- Use of open beaches for resting and possibly also for pupping was documented through direct observations on several occasions during field surveys; it has been possible to observe mothers and their pups and adult females and males interacting on open beaches on several occasions.
- During the monitoring period only one pup has been found dead within the first two months of its life.
- Adult monk seal mortality: So far, during the monitoring efforts of MOm seal no adult monk seals have been found dead at the Island of Gyaros.
- Monk seal population estimation: A number of factors, such as the cryptic behaviour and the scarcity of the species, the inaccessibility of its habitat and the limited knowledge on individual home ranges and travel distances, make Mediterranean monk seal population estimates an extremely difficult task. This applies even to areas, such as the Cabo Blanco region in Mauritania, where the morphology of the habitat and the different behaviour of the seals have allowed the use of standard mark-recapture methodologies for population estimation (Forcada & Aguilar 2000). The photographs and/or video footage obtained during the visits to the monk seal shelters at the island of Gyaros and the application of the pre-programmed photo-cameras have so far enabled the individual identification of 17 individuals [excluding newborn pups; i.e., 10 adult females, 3 adult males (Figure 12), 4 unknown sex]. In one occasion, 10 animals were recorded on a single image (Figure 3). According to the mean value of the annual pup production it is expected that a number of about 55 animals of different age categories (excluding pups) consist the monk seal population around the island.
- Monk seal sightings collected by non-specialists: Since 1990 the RINT of MOm has received 34 accounts of monk seal observations reported by non-specialists from the Island of Gyaros. The majority of the reports have come from amateur fishermen, who occasionally visit the island (i.e. mainly for spear gun fishing) and from parts of the island that have been identified by the researchers of MOm as important for the survival of the species in the area.
- Behavioral observations: During the field surveys in 2004 and 2005, females and their pups were encountered resting on three open beaches at the south-western coast of the island. On one occasion in 2004, eight of the ten pups observed during

that survey were recorded swimming along a 150 m long stretch of coastline and evidence was recorded that suggested that at least one of the pups was born on an open beach (i.e. absence of suitable pupping caves nearby, healing wounds in the umbilicus region of the pup). In 2005, a female suckling her pup was observed on one of the open beaches. Upon inspection of cave GIA 4 in 2007 six newborn pups were recorded. In November 2010, five seals were observed resting on an open beach at the south side of the island.

- The use of the automatic infrared cameras has also provided valuable insights into several aspects of the poorly-understood behaviour of the Mediterranean monk seal, especially regarding the social structure and behaviour of the species during the pupping season. Among the most important findings have been the recording of two births, fostering behaviour, aggressive interactions between adult females and the nursing activity of adult females.

## CONCLUSIONS

The Mediterranean monk seal is a species whose behaviour has been severely affected by human activity; millennia of persecution and habitat destruction and fragmentation have led the species to seek inaccessible marine caves for resting and reproduction, thus making it almost impossible to study. In addition, the ongoing persecution by humans has reduced populations to such an extent, that only one population, the one at Cabo Blanco / Mauritania has retained the social structure of a colony (Gazo et al. 2000; Martínez-Jauregui et al. 2012). All other populations throughout the distribution of the species are considered to be composed of loosely associated, small family units (Johnson et al. 2006).

Due to the high pupping rate of the population, the importance of the monk seal population at the island of Gyaros was recognized early on (Dendrinis et al. 2008). However, only the recent application of the combined approach of infrared cameras and field surveys has enabled us to fully evaluate the importance of the Gyaros island monk seal population. The results of the monitoring efforts so far indicate the existence of a monk seal population that has retained the social structure of a colony (Karamanlidis et al. 2013), such as the one in Cabo Blanco. This is only the first case of a monk seal "colony" in the eastern Mediterranean Sea and exemplifies the importance of Greece in the effective conservation of the species. It has been possible to document demographic parameters and a social structure similar to the one observed in Cabo Blanco. The monk seal colony at Gyaros however has the advantage of being able to use two caves for resting and reproduction (i.e., cave GIA4 and the newly discovered cave GIA10) that lay in exact opposite directions, thus offering protection under all weather circumstances and reducing pup mortality. High pup mortality has been identified as one of the main factors affecting the slow recovery of the monk seal colony at Cabo Blanco (Forcada et al. 1999; Gazo et al. 2000; Gonzalez et al. 2002).



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**CYCLADES Life: Integrated monk seal conservation of Northern Cyclades**