



*Final Conservation Status Report
of the Mediterranean Monk Seal
population at the island of Gyaros*
Executive summary

June 2018

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The Mediterranean monk seal (*Monachus monachus*) is one of the 33 seal species on Earth and the sole species of the Genus *Monachus*. It is estimated that the total population of the species does not exceed 700 individuals that survive in three isolated sub-populations: the biggest part of the total population of the species, approximately 350 - 400 individuals, lives in the coastal areas of insular and continental Greece. In 2004 MOm started studying the Mediterranean monk seal at one of its most important habitats in Greece, at the island of Gyaros, while in 2011 MOm established a permanent population monitoring system within the framework of the program Cyclades-LIFE.

The monitoring of the monk seal population and its habitats at Gyaros was based on 4 different methodological approaches:

- a) The identification, evaluation and systematic monitoring of the most important terrestrial habitat of the species.
- b) The systematic monitoring of the local monk seal population.
- c) The collection of data related to the biology, ecology and behavior of the species in the area.
- d) The collection and evaluation of genetic data.

From September 2013 – March 2018 44 field surveys and 474 visits to monk seal shelters and open beaches were carried out, during which 53 direct observations of monk seals were recorded. In addition, 44.445 photographs and short video sequences were recorded by the infrared monitoring systems. The basic results and conclusions of the Cyclades-LIFE program are summarized as follows:

1. Along the coastline of Gyaros 11 monk seal shelters and 8 open beaches that are regularly used by the local monk seal population for resting and

- pupping were recorded. The density of suitable shelters along the coastline of Gyaros is 1,95 shelters/km coastline, which is the highest density of suitable habitat in Greece. The availability of suitable habitat is an important factor in the reproductive success (i.e., survival) of the species, as a high density of suitable pupping habitat provides increased shelter options for mothers and their pups during bad weather conditions.
2. The two pupping caves at Gyaros (GIA4 and GIA10) possess ideal morphological features and are therefore used most frequently by the local monk seal population. The terrestrial activity patterns of monk seals at Gyaros are in accordance with the activity patterns of monk seals in other parts of their distribution range. Monk seals at Gyaros use the terrestrial habitat mainly during the night and during the pupping season in order to bear and raise their young. Furthermore, Gyaros is the only area in the eastern Mediterranean Sea where the use of open beaches to raise newborn pups has been observed.
 3. During the project 45 newborn pups were recorded and the annual pupping rate at Gyaros from 2011 on was 9,3, which is the highest pupping rate that has been recorded so far for the species in the Mediterranean. Generally, the pupping season at Gyaros coincides with the pupping season of the species throughout Greece, spanning from August to November, with a peak in pupping events in mid-October.
 4. During the Cyclades-LIFE project only three newborn pups were found dead. This low neonatal mortality rate is not uncommon for Greece and is most likely due to the high availability of alternative pupping sites in the area, which can be used during bad weather conditions.
 5. 42 different adult individuals were identified in total at Gyaros (i.e., 34 adult females and 8 adult males). Based on the previous and the fact that the annual pupping rate is 9,3, it is estimated that the total monk seal population at Gyaros is approximately 65 individuals. This estimated population makes up approximately 9% of the minimum global population and approximately 18,5% of the minimum population estimated to live in Greece. This fact in combination with the observations on the social structure and the behavior of the species in the area lead us to believe

that the monk seal population at Gyaros has preserved the characteristic social structure of a seal colony, such as the one found at the monk seal colony at Cabo Blanco. These facts, in combination with the fact that the monk seal population in Greece is the biggest in the world, highlight the great importance of the monk seal population at Gyaros for the survival of the species.

6. It has been documented that the monk seal population of Gyaros is an “open” population, moving in a large (but not yet precisely known) radius around Gyaros, using terrestrial habitat in other neighboring islands. This fact makes the need to properly manage the species in a broader geographical framework.
7. In regard to the behavior of the Mediterranean monk seal at the island of Gyaros the researchers of MOm recorded one case of allosuckling and 7 cases of intraspecific aggression among adult females. Latter observations are of particular importance for the management of the Mediterranean monk seal in Greece, as they highlight the competition between reproductive females over suitable pupping sites: given their limited availability it is of utmost importance that these sites are effectively protected.
8. Fifty five genetic samples were collected in total in Gyaros and the wider study area. 84% of the samples that were successfully analyzed bore the MM01 genotype, while 16% bore the MM02 genotype. No samples were found with the genotype MM03 ή MM04, while the levels of heterozygosity were extremely low ($H_o = 0.375$, $H_e = 0.460$). Furthermore, preliminary analyses indicated that monk seals in Gyaros and in the wider study area of the Cyclades Islands belong to a contact zone between two genetically distinct monk seal populations in the Aegean Sea, one in the northwestern and one in the southeastern part of the Sea. These results are in general accordance with results from wider monitoring efforts in the eastern Mediterranean Sea.

All the results of the study highlight the importance of Gyaros as one of the best remaining habitats for the Mediterranean monk seal. The regular resting,

suckling and perhaps also, birth of pups on open beaches are all indications of minimal human activity and the excellent quality of the habitat for monk seals at the island of Gyaros. It should be noted that monk seal activity on open beaches has not been recorded in the eastern Mediterranean Sea for more than 50 years. However, and as in recent years the existence of this particular monk seal population has become widely known among the general public there is a chance that human activity in the area might increase from people who want to observe this endangered species.

Furthermore, it is important to note that the monk seal population at Gyaros is not isolated, but is an integral part of a geographically wider population that faces all the threats that have been identified so far to affect the survival of the species (i.e., negative interactions with coastal fisheries, habitat loss and habitat fragmentation). It is therefore important that effective protection measures for this monk seal population are planned on a wider geographic framework. Considering the above we believe that effective protection measures for the Mediterranean monk seal population at Gyaros should include:

- A) The establishment by the Hellenic State of an effective management scheme for the area.
- B) The continuation of the scientific monitoring of the Mediterranean monk seal population at Gyaros. This monitoring should be based on the monitoring scheme that has already been established and should be conducted within the framework of the national monitoring of the species and in cooperation with the national Monk seal Rescue and Information Network.
- Γ) The management of the Mediterranean monk seal population at Gyaros, which should be carried out within the framework of the overall Management Plan for the Mediterranean monk seal in Greece.



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