PRELIMINARY RESULTS OF MONITORING THE BREEDING PERFORMANCE OF THE CORY'S SHEARWATER ON STROFADES ISLAND COMPLEX (IONIAN SEA, WESTERN GREECE)

Georgios Karris[1], Stavros Xirouchakis[2], Kostas Grivas[3], Tasos Dimalexis[3], Stella Fraguedakis-Tsolis[4], Sinos Giokas[4] & Spyros Sfenthourakis[4]

[1] Department of Ecology and the Environment, Technological Educational Institution (TEI) of Ionian Islands, GR-29100, 2 Kalvos Square Zakynthos, Greece, e-mail: gkarris@teiion.gr
[2] Natural History Museum of Crete, PO Box 2208, GR-71409 Crete, Greece
[3] Hellenic Ornithological Society, GR-10682 Vas. Irakliou 24 Athens, Greece
[4] Section of Animal Biology, Department of Biology, University of Patras, GR-26500 Patra, Greece

Introduction

Although establishment of a huge number of offshore protected areas has been a mechanism of vital importance for the conservation of seabirds, application of the same principle to marine ecosystems has been a quite recent development. The establishment of the Natura 2000 network in the marine environment through the identification of marine Important Birds Areas (IBAs) for seabird species is a conservation measure of high priority according to the European Commission[1,2].

Greece has just undertaken the responsibility to designate marine IBAs for specific target seabird species, with funding by the EU's LIFE financial instrument (Project title: "Concrete conservation actions for Mediterranean Shag and Audouin's Gull in Greece including the inventory of relevant Marine IBAs" (LIFE 07 NAT/GR/00285)). Under the framework of this project a Cory's shearwater (*Calonectris diomedea diomedea*) survey was initiated in 2007 in the National Marine Park of Zakynthos in the Ionian Sea (western Greece). The main aim of this pilot study was to contribute to the enhancement of the scientific knowledge on the Greek seabird populations and to gather the information necessary for the creation of an inventory of marine IBAs for Cory's shearwater in Greece.

Figure 1. Breeding pair during incubation (photo: G. Karris)

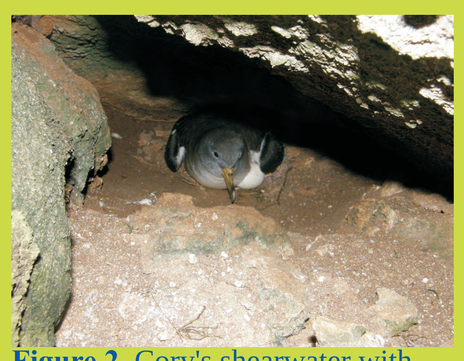

Figure 2. Cory's shearwater with egg laid (photo: G. Karris)

Figure 3. Checking burrows for hatched nestlings (photo: N. Koulamas)

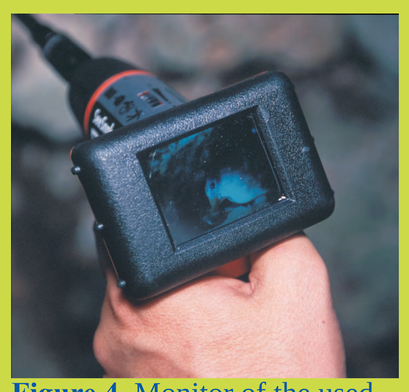

Figure 4. Monitor of the used burrowscope (photo: N. Koulamas)

Study Area & Methods

Strofades island complex is a group of two small islands, inhabited by one monk, and numerous rocky islets. They belong to the National Marine Park of Zakynthos in Greece and lie about 30 miles south of Zakynthos and 26 miles west of Peloponnisos peninsula. The total area of Strofades is 4km^2 and the highest point is at 22 m.a.s.l. The two islets host an estimated population of 2,000-3,000 Cory's shearwater breeding pairs and constitutes a significant colony for the Mediterranean subspecies (Figures 1 and 2). Nest plots are established in different habitats characterized by the presence of rocky cliffs, soft soil, maquis vegetation and caves.

From 1st June - 30th September 2007 and 2008, a sample of 103 nest sites distributed throughout the colony of the largest island (Stamfani) were monitored in terms of breeding performance. A fieldwork team of 3-4 members checked (during moonless nights) nest sites with different burrow quality by using a burrowscope with wide angle CCD camera and 2m cable, so as to ensure the minimum of bias concerning the evaluation of breeding success (Figures 3 and 4).

Data on breeding performance were recorded in datasheets along with general information (e.g. date, time, observers, weather conditions, evidence of predation etc.), sector name and GPS waypoints defining the exact location of each nest site and nesting habitat type. Birds were also ringed, blood sampled and measured. These data were entered in a database, interactively connected with a GIS software so that data, such as the location and size of Cory's shearwater colony, could be depicted in digital maps (Figure 5) with respective geographical parameters.

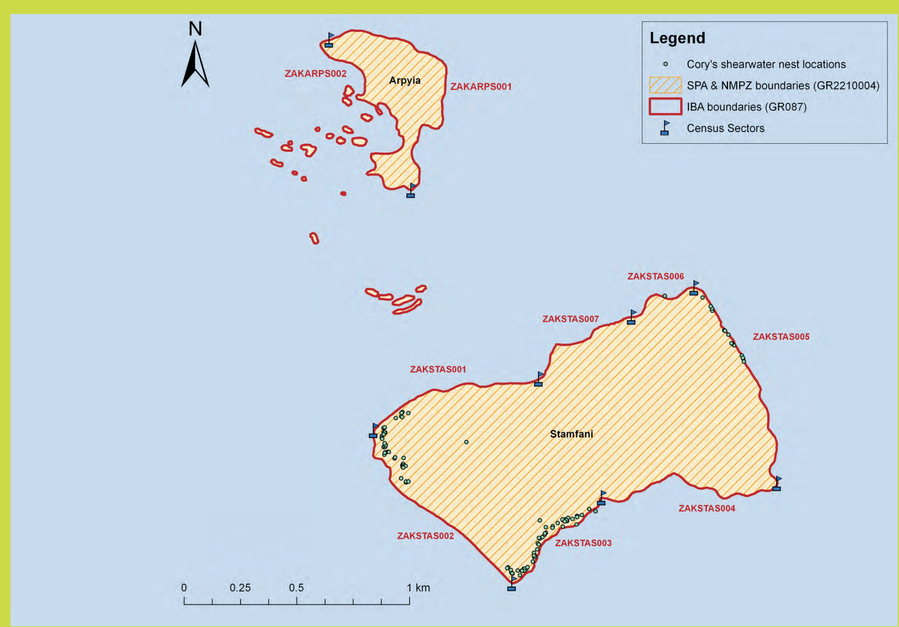

Figure 5. Cory's shearwaters nest sites on Stamfani island

Results/Discussion

The data obtained by monitoring the breeding performance showed a breeding success up to 0.7 fledglings per nest per year. In addition, **hatching success** (chicks hatching successfully per egg laid) was 83.5% and **fledging success** (fledglings per egg laid) was found to be 84.9% for the breeding seasons of 2007 and 2008 (Figures 6 and 7). These results point out a slight difference on the levels of **breeding failure** between incubation and fledging periods, in contrast with respective estimates recorded in other colonies across the Mediterranean Basin where a significantly higher breeding failure during incubation was recorded.

Furthermore, **breeding failure**, scored as eggs failed, dead chicks or empty nests (where an egg had been recorded during the incubation period) reached a value of 30%. It is assumed that the lower productivity estimated on Strofades Islands in comparison with the respective data for a south Aegean colony in Greece, may be correlated to the high predation pressure by rats[3]. **Predation** threat was mainly observed at the western sector of Stamfani islet, where more nest sites were accessible and vulnerable to predators, causing a 30% of the **total hatchling loss** according to fieldwork observations (Figure 8).

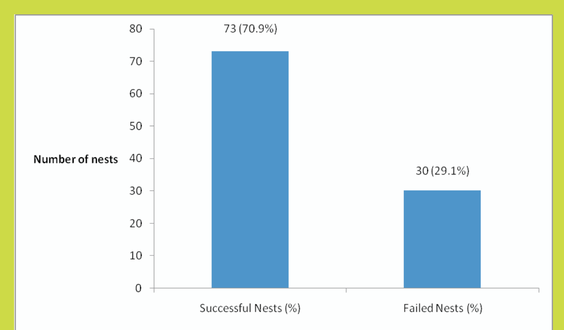

Figure 6. Breeding success and breeding failure of *Calonectris diomedea diomedea* on Strofades islands for the breeding seasons 2007 and 2008

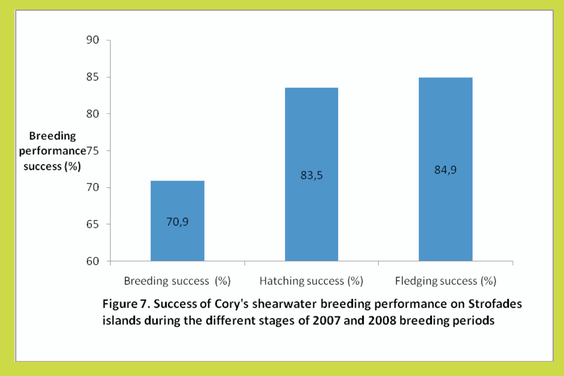

Figure 7. Success of Cory's shearwater breeding performance on Strofades islands during the different stages of 2007 and 2008 breeding periods

Figure 8. Rat predation on a Cory's shearwater chick (photo: G. Karris)

Further project aims

- Estimation of the Cory's shearwaters population size (by counting Apparently Occupied Sites in randomly selected plots and by using a tape playback method) on Strofades islands
- Study of Cory's shearwaters dispersal and foraging ecology during the breeding season by using tracking equipment, data loggers, European Seabirds at Sea (ESAS) and coastal counts
- Evaluation of accidental trapping (bycatch) of Cory's shearwaters in the Ionian Sea as a result of longline fisheries
- Assessment of chemical pollution and rat predation effects on Cory's shearwater breeding performance on Strofades.
- Assessment of genetic variability of Cory's shearwater population on Strofades

References

[1] European Commission, 2007. Guidelines for the establishment of the Natura 2000 network in the marine environment. Application of the Habitats and Birds Directives.

[2] BirdLife, 2007. Towards the identification of marine IBAs: Guidelines for identification and delineating marine Important Birds Areas (IBAs) for pelagic species, Birdlife 2007

[3] Ristow D., Feldmann F., Scharlau W., Wink C. and M Wink. 1991. Population dynamics of Cory's Shearwater (*Calonectris diomedea*) and Eleonora's falcon (*Falco eleonorae*) in Eastern Mediterranean. *Seitz A, Loeschcke V (eds) Species conservation: a population-biological approach. Birkhauser, Basel*, 199–212.

LIFE project partners