



**LIFE**  
ANDROS PARK



## Layman's report

Conservation of priority species and habitats of Andros Island protected area integrating socioeconomic considerations

## **PROJECT IDENTITY CARD**

**Title:** Conservation of priority species and habitats of Andros Island protected area integrating socioeconomic considerations

**Acronym:** LIFE Andros Park – LIFE16 NAT/GR/000606

**Duration:** 01/09/2017– 30/09/2022

**Coordinating beneficiary:** Agricultural University of Athens

**Associated beneficiaries:**

Municipality of Andros

Hellenic Agricultural Organization – Demeter

Kaireios Library

Fundación CBD para la conservación de la Biodiversidad y su Habitat

MOM, Hellenic Society for the Study and Protection of the Monk Seal

Nature Conservation Consultants NCC Ltd

**Co-funding:** European Commission, Green Fund

**Total budget:** 2,345,329 €

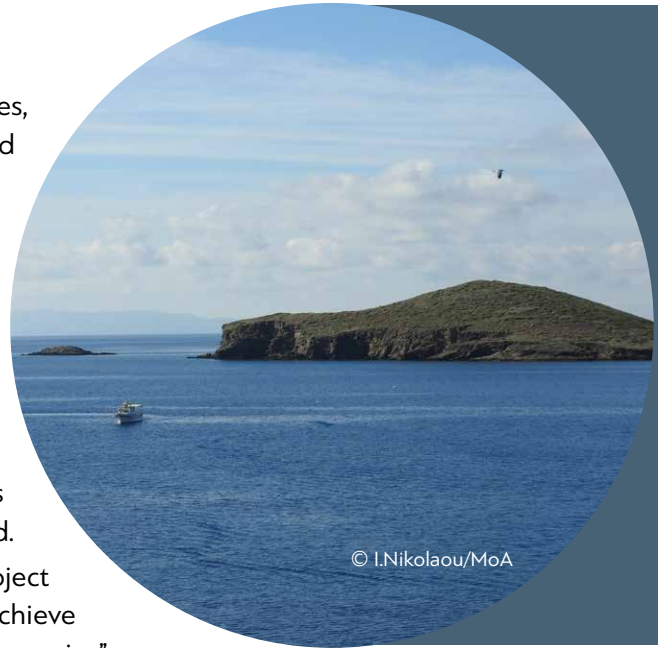
**EU Contribution:** (75%) 1,754,918 €

## INTRODUCTION

Andros is the northernmost island in the Cyclades, consisting a link between the Cyclades and mainland Greece, which is reflected in its geographic and biotic characteristics. Its terrestrial and marine environment exhibits great diversity of habitats, which host rare and endangered species, the most important among which are Eleonora's Falcon, Bonelli's Eagle, Mediterranean Shag, Audouin's Gull, and Mediterranean Monk Seal. Among habitat types, alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (91E0\*) is characterized as a priority habitat of Andros Island.

The project was a continuation of the LIFE+ project "Management of the SPA site of Andros Island to achieve a Favourable Conservation Status for its priority species"

(LIFE ANDROSSPA) that was implemented in the Special Protection Area (SPA) of Andros Island in order to achieve an integrated management of the Natura 2000 sites of the island. The LIFE ANDROSSPA project ([www.androslife.gr](http://www.androslife.gr)) was implemented during the period 2011-2017 and its main achievements were the improvement of the conservation status of the Eleonora's Falcon, the Bonelli's Eagle, the Mediterranean Shag and the Audouin's Gull on Andros Island through a series of interventions.



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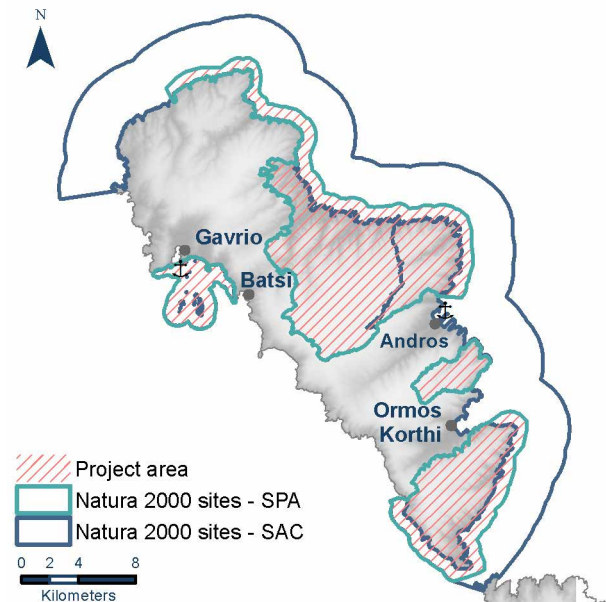
## Project's objectives

The project aimed to implement actions to significantly restore and improve the conservation status of the terrestrial priority habitat, alluvial alder forests (91E0\*), as well as of the marine species Mediterranean Monk Seal, Mediterranean Shag and Audouin's Gull within the Natura 2000 sites of Andros Island.

The ultimate vision of these efforts was to establish a holistic management of Andros Natura 2000 sites with the support and active involvement of the local community and key stakeholders.

## Project site

The project was implemented on the island of Andros and especially at the Special Protection Area (SPA) "Andros: Kentriko kai Notio Tmima, Gyro Nisides kai Paraktia Thalassia Zoni" (GR4220028), and the Special Area of Conservation (SAC) "Andros: Ormos Vitali kai Kentrikos Oreinos Ogkos (GR4220001)", covering 40% of Andros island's terrestrial area and 70 km<sup>2</sup> of the surrounding marine area.



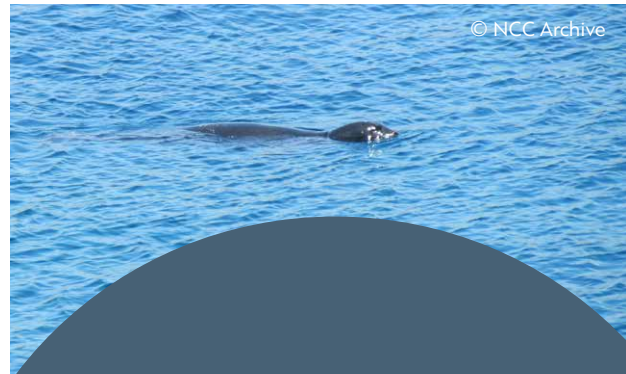
# PROTECTION AT SEA

## Mediterranean Monk Seal

The Mediterranean Monk Seal is considered the rarest seal species and one of the most threatened marine mammals in the world. The preferred terrestrial habitat used by the species is well-protected marine caves found along remote or inaccessible stretches of coastline with specific morphological characteristics.

The largest population of the Mediterranean Monk Seal survives currently in the eastern Mediterranean Sea, a marine area heavily impacted by human activity. The species survives mainly along the islands in the Aegean and Ionian Sea and the coasts of mainland Greece. Approximately 400 individuals live and breed in Greek waters.

The Cyclades archipelago is one of the most important Mediterranean Monk Seal areas in Greece and the Mediterranean Sea. On the island of Gyaros (only 10 nautical miles away from Andros) occurs one of the species' largest populations in the Mediterranean Sea, which uses the marine area around the island of Andros in its quest for food, and the sea caves of the island as a resting and possibly reproduction area.



### Main threats for the Mediterranean Monk Seal on Andros Island

- Plastic marine debris and derelict fishing gear in the species' foraging, resting and pupping areas.
- Interactions with coastal fishermen operating in the area.
- Overfishing and fish-stock reduction.

## Actions for Mediterranean Monk Seal conservation

The project implemented conservation actions for the Mediterranean Monk Seal on Andros Island as to date no such measures had been carried out for the protection of the species in this area.

Systematic monitoring of marine caves where the occurrence of the Mediterranean Monk Seal has been reported, has shown that there are at least 13 caves suitable for the species in the wider area, of which 6 are on Andros, 5 on Tinos and the Mandilou islet and 2, already known from previous actions, in Gyaros. A system of automatic cameras was installed inside 5 marine caves to remotely monitor the species.



For the improvement of Mediterranean Monk Seal habitats, removal of marine plastic debris and derelict fishing gear from marine caves was carried out on Andros and Tinos Islands, Gyaros and Mandilou islets, as well as underwater cleanups on the islands of Andros and Tinos.

Aiming at creating a framework of harmonious coexistence between local fishermen and the Mediterranean Monk Seal, guidelines of the Andros Brand trademark for local fishing products were prepared, for the fishermen willing to voluntarily follow marine biodiversity friendly fishing practices. Fishing tourism was promoted through an ecotourism platform providing all the necessary information on ecotourism opportunities for fishermen, in combination with the operation of the ecotourism information kiosk in Gavrio informing visitors about Andros Brand and the possibility of organising fishing tours in Andros.

Throughout the project's duration, close cooperation was achieved with local associations, fishermen and authorities. In order to record and combat illegal fishing practices, wardening and patrolling of marine areas from the land were implemented in cooperation with Andros Port Authority.

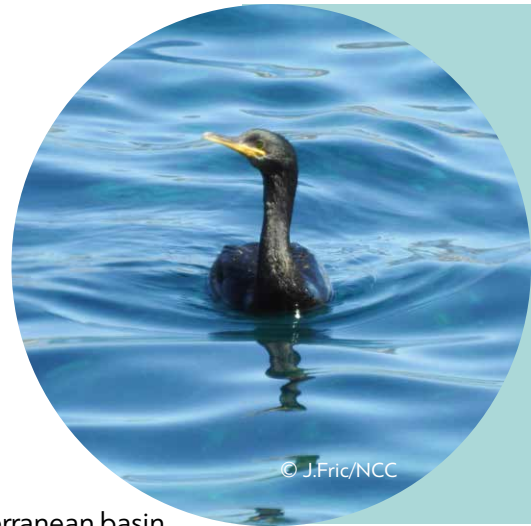


## Seabirds

### Mediterranean Shag

It is a subspecies endemic to the Mediterranean and the Black Seas. There are 1,300–1,450 pairs of the Mediterranean Shag breeding in Greece.

The species is resident within the project area, however individuals from the neighboring colonies in N. Cyclades also use the surrounding marine area. The area hosts approx. 5%-9% of the national breeding population of the Mediterranean Shag, one of the top 5 breeding sites for this species in Greece.



### Audouin's Gull

It is a globally threatened species and endemic to the Mediterranean basin.

In Greece they nest in small colonies (3-86 pairs) on isolated islets, far from human presence. There are 350–500 pairs of Audouin's Gull breeding in Greece.

Important breeding, roosting and foraging habitats during breeding and non-breeding seasons are found within the project area. The area hosts 2.7-4.3% of the national breeding population of the Audouin's Gull.

Important habitats for the survival of the seabirds in the area include uninhabited islets and the coastline of Andros Island, used for breeding and roosting, while the wider marine area features important foraging grounds for both species, including the individuals breeding in the area of Andros, as well as individuals coming from the neighbouring islands.





### Main threats for seabirds on Andros Island

Due to the fact that the main threats for the Mediterranean Shag and Audouin's Gull at their breeding colonies in the area have been either eliminated or reduced through the LIFE ANDROSSPA project implementation, today the main threat for the species is:

- Marine plastic debris and microplastics as well as derelict fishing gear at the species' foraging, roosting and breeding habitats.



### Actions for Mediterranean Shag and Audouin's Gull conservation

The project implemented actions related to the removal of plastic debris and derelict fishing gear from the seabirds' breeding colonies and the coastline of Andros Island as well as the sea. Seabirds are directly threatened by entanglement, ingestion and ghost-fishing caused by plastic debris and derelict fishing gear, as well as by chemical pollution through ingestion of fish feeding on microplastics.

In total, 9 coastal sites have been cleaned on Andros Island from plastic and other marine debris for habitat improvement of seabirds and the Mediterranean Monk Seal, while microplastic samples were collected



and the abundance and types of marine plastic and microplastic on coasts were assessed. Actions for removal of debris from coastal sites were implemented in collaboration with local organizations and associations, with more than 160 volunteers of all ages participating.

On the seabird colony islets, manual removal of marine litter and sampling for plastics were carried out.

Debris and fishing gear on the seafloor were located acoustically, with the use of a side-scan sonar, while floating debris was collected through a custom-made collection system.



## PROTECTION ON LAND

### Terrestrial habitats – Alluvial alder forests (91E0\*)

Alluvial alder forests comprise a habitat of Community interest found on low-lying damp and riparian localities of alluvial and marshland ecosystems. These riparian forests are associated with a large variety of plant and mushroom species (macrofungi).

Andros Island lies at the southernmost limit of the priority habitat distribution in the Balkan Peninsula. The main alluvial *A. glutinosa* forests of Andros are located at Vori and Lefka valleys, having also a patchy distribution along the main streams of the island. According to the up-to-date data, the habitat occupies an area of 29 hectares. Unfortunately, ca. 40% of its area was destroyed or was severely degraded during the last years.

Alders play a very important role in nature conservation since they assist with water filtration and purification in waterlogged soils, while their root system helps control floods and stabilize riverbanks. Since high increase in floods is foreseen due to climate change, alders could play an essential role in the protection of riverbanks from erosion.



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*Omphalotus olearius*, © I.Polemis/AUA

## Main threats for alder forests on Andros

- Grazing by sheep and goats results in the destruction of alder seedlings and degradation of the plant diversity of the area.
- Wildfires, with important indirect effects, as the denudation of surrounding slopes results in heavy flooding phenomena combined with soil erosion. Intense flooding phenomena are responsible for serious degradation of the habitat during the last few years.
- Abandonment of local crops and terraces, which has led to insufficient maintenance of the riverbed making it more vulnerable to intense rainfalls.
- Giant reeds expand fast at the expense of alders.



## Actions for alluvial alder forest conservation

- In situ small-scale interventions

As part of the project, a series of interventions have been carried out aiming to protect alder forests from their main threats.

For the protection against flooding phenomena, in total, 2 km of the riverbed at Vori was cleaned from debris, and the river estuary was suitably re-established, facilitating drainage of water towards the sea, thus allowing the alders to recover.

Furthermore, traditional terraces have been repaired in order to keep the surrounding soils from being washed away to the river by heavy rainfall, while existing paths have been cleaned and adjacent shrubs and trees were pruned, in order to act as small firebreaks.

In an effort to protect the area from new wildfires, water tanks were installed, and are regularly filled with water by the Association of Volunteer Firefighters of Andros.

In certain littoral areas with alder forests, management of giant reed (cane) stands was implemented.



- **Restoration of the alluvial alder forests**

For the restoration and recovery of alluvial alder forests, conservation interventions were implemented, in an area of ca. 11 hectares, involving planting of new saplings and conservation of important plant species and macrofungi associated with alder trees.

Thousands of alder seeds were collected, and their germination was optimized. A large-scale sowing of alder seeds and inoculation of saplings with their associated microbiota (mainly ectomycorrhizal fungi) followed at the premises of the Agricultural University of Athens.

The saplings were then transplanted at the nursery established in the Agadaki Estate in Andros to be acclimatized to the local conditions, before their transfer at the restoration sites. In total, ca. 11,000 seedlings were placed and protected by fencing at Vori and Lefka for the restoration of the degraded alluvial alder stands.



- **Ex-situ conservation actions for selected plants and macrofungi associated with alder forests**

For the ex-situ conservation of plant and alder-associated macrofungi species, the **Botanic Garden of Andros Island** and the **seed bank** of the Agricultural University of Athens were created.

Plant collections focused on the alluvial alder stands, but adjacent areas with representative local plant species were also sampled. A total of 219 plant specimens from the alder forests of Andros have been dried, identified, and deposited in the Herbarium of the Agricultural University of Athens.

Among them, three plant species are rare and face increased extinction risk, i.e., *Galanthus ikariae*, *Allium stamatiadae* and *Hypericum cycladicum*. Ex-situ conservation actions were applied including the establishment of living collections in the Botanic Garden and seed accessions deposited in the seed bank of the Agricultural University of Athens.

Concerning mushrooms, a total of 96 species associated with alders (by either forming specialized symbiotic relationships with the trees, or by growing on wood, plant litter and humus) were identified and are stored as dried specimens at the Fungarium of the Agricultural University of Athens.

During the project, **2 plant species new to science were described**, *Hypericum cycladicum* from Vori and *Allium stamatiadae* (in honour of the Andriot botanist Elli Mandaraka-Stamatiadou) from Vourkoti.



# BOTANIC GARDEN

During the project, the Botanic Garden of Andros Island was established for the conservation of plant species and alder-associated macrofungi, highlighting the rich diversity of the wider area, and is now in operation for promoting of pertinent educational and public awareness activities.

The Botanic Garden is part of the Agadaki Estate (Kaireios Library) located in the village of Apatouria, covering an area of about 8,000 m<sup>2</sup> and including an old tower house and an olive mill, which have been completely restored, as well as 11 main terraces full of old olive trees, citrus and various other fruit trees, expanding until the nearby river of constant flow.

Part of the Estate was properly transformed into the Botanic Garden, which includes 4 main thematic units: (a) plants of phrygana communities, including aromatic plants, (b) plants representing scrubs and forest species, (c) orchard and arboretum, and (d) plants existing in alluvial and riparian forests. It hosts more than 140 species of plants of Andros Island, representative of local flora, including rare and threatened species. Additionally, a Mushroom Garden was created hosting more than 30 mushroom species, being the first in Greece with a thematic unit dedicated to mushrooms.





## INFORMATION AND AWARENESS RAISING

A broad dissemination campaign was organized and implemented aiming at the protection of priority species and habitats of Andros Island, supported by the operation of the Information Center in Korthi, Information Kiosks in Chora and Gavrio, as well as the Botanic Garden at the Agadaki Estate (Kaireios Library).

Dissemination material on the project's objectives and actions, the priority species and habitats, as well as the plants and mushrooms of Andros Island was produced, framed by the creation of the documentary entitled "Following the course of water on Andros Island".

Thematic exhibitions on the plants and mushrooms of the alder stands of Andros Island were organized in the Tower of the Agadaki Estate, while a photo exhibition on the biodiversity of Andros was also held at the same venue. In collaboration with local stakeholders, forays were organized to familiarize the local community with the plants and mushrooms of Andros, with great participation and strong interest from the hikers.

A series of technical meetings and seminars was organized for local stakeholders, aiming to effectively plan the implementation of project actions, improve the information and know-how exchange between the project and target key stakeholder groups, and present and promote the project approaches in other areas. Meetings were held with representatives from the fishing, tourism and catering sectors, focusing on fishing tourism and the more effective promotion of the island's local products, while two Mediterranean Monk Seal rescue seminars were held, involving local authorities and coastal fishermen.

The experience from the management of the Capo Blanco protected area in Mauritania was transferred through seminars to the executives of the Management Bodies of Karpathos and Alonissos protected areas, while the exchange of knowledge and experience was completed with visits of executives to Andros and Mauritania.



For the new generation, educational material on “Alders and other residents of Andros Island” was designed and implemented, in collaboration with the Environmental Education Center of Korthi.





## AFTER LIFE

The experience gained through the restoration of degraded or destroyed alder stands and the improvement of the conservation status of the Mediterranean Monk Seal, the Mediterranean Shag and the Audouin's Gull, has become a valuable tool to be applied to other protected areas, with the active involvement of the local community.

For the conservation of plant species and alder-associated macrofungi, the Botanic Garden of Andros Island, an integral part of the Agadaki Estate, will continue to be operational and host visitors. The interventions carried out at the alluvial priority habitat will be maintained, while the development of the new alder stands will be monitored and protected.

Monitoring of the Mediterranean Monk Seal and seabird populations and their terrestrial habitats will be continued after the end of the project in the area, while necessary cleanups of marine debris will be carried out when needed. In addition, the wider area will be continuously supported by the operation of the Hellenic Rescue and Information Network for the Mediterranean Monk Seal implemented by MOM.

Natura 2000 areas of Andros Island are now in a better conservation status than before the project's implementation. Their future looks more favorable especially after the legal adoption of the proposals of the Special Environmental Study and their management by the Natural Environment & Climate Change Agency (N.E.C.C.A.). With the LIFE Andros Park project, a very important period for the protection of the valuable biodiversity of Andros Island is completed. And another, more promising, begins...



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