

# LIFE PINNARCA

LIFE NAT/ES/001265



## DELIVERABLE D2.2

### REPORT THE STATUS OF THE FOLLOWED INDIVIDUALS II

(Within the action D2: FOLLOW UP OF RESISTANT *Pinna nobilis* INDIVIDUALS)



**CSIC-IEO**  
**IOPR**  
**UNINA**  
**IRTA**  
**UAEGEAN**



## **PARTICIPANTS :**

### **CSIC-IEO:**

Maite Vázquez Luis, Raúl González

Instituto Español de Oceanografía (IEO, CSIC), Centro Oceanográfico de Baleares. Muelle de poniente s/n, 07015. Palma de Mallorca, Spain. Contact: [maite.vazquez@ieo.csic.es](mailto:maite.vazquez@ieo.csic.es)

### **IOPR**

Robert Bunet, Mathieu Foulquié

Institut océanographique Paul Ricard, Ile des Embiez, 83140 Six-Fours-les-plages, France; University of Toulon, CNRS/INSU, IRD, MIO UM 110, Mediterranean Institute of Oceanography, France

Nardo Vicente

Institut Méditerranéen de Biodiversité et d'Ecologie marine et continentale (IMBE), Aix-Marseille University, Avignon, CNRS, IRD, France

### **UNINA**

Francesca Carella

University of Naples Federico II Department of Biology, Complesso Universitario di MSA, 80123, Naples Italy.

### **IRTA:**

Patricia Prado, Alba Garriga Costa, Carles Alcaraz

Institut de Recerca i Tecnologia Agroalimentàries, Ctra. De Poble Nou Km. 5.5, E-43540 Sant Carles de la Ràpita

### **UAEGEAN**

Orestis Papadakis, Evangelos Papadimitriou, Stelios Katsanevakis

Department of Marine Sciences, University of the Aegean. University hill, 81100, Mytilene, Lesvos, Greece



**To be cited as:**

González R., Bunet R., Foulquié M., Vicente N., Carella F., Prado P., Garriga A., Alcaraz C., Papadakis O., Papadimitriou E., Katsanevakis S., Vázquez-Luis M. (2023). Deliverable D.2 – Report of the status of the followed individuals II. Within the action D2: Follow up of resistant individuals (*Pinna nobilis*). LIFE Pinnarca NAT/ES/001265 ‘Protection and restoration of *Pinna nobilis* populations as a response to the catastrophic pandemic started in 2016’, October 2023, 27 pp.

**This report is confidential, and the reproduction or dissemination of the content and data of this document to non-contracting third parties is prohibited, without the express authorization of partners, unless otherwise agreed by the parties granting the agreement when it is the object.**



## INDEX

<b>1. Background</b>	<b>5</b>
<b>2. Follow up of resistant <i>Pinna nobilis</i> individuals</b>	<b>7</b>
<b>2.1. BALEARIC ISLANDS</b>	<b>7</b>
2.1.1. Background	7
2.1.2. Current activities	7
2.1.3. Overview	10
<b>2.2. EBRO DELTA</b>	<b>11</b>
2.2.1. Contextualization	11
2.2.2. Follow up of the resistant individuals	11
2.2.3. Environmental monitoring of the area	13
2.2.4. Relevant aspects	14
<b>2.3. FRANCE</b>	<b>15</b>
2.3.1. Open sea	15
2.3.2. Sanctuary areas	17
<b>2.4. ITALY</b>	<b>22</b>
<b>2.5. GREECE</b>	<b>22</b>
<b>3. References</b>	<b>26</b>

## 1. Background

The fan mussel *Pinna nobilis* (Linnaeus, 1758), an endemic and protected bivalve of the Mediterranean Sea, is affected by a Mass Mortality Event (MME) started in 2016. The populations of *Pinna nobilis* in the open sea have almost completely disappeared from the Mediterranean coasts (Katsanevakis et al. 2021), although some surviving individuals in the open sea have been located and have been monitored. During these years, an active search for *P. nobilis* survivors has been carried out in some countries, in most cases integrated into the different monitoring programs for the marine environment. Regarding the Deliverable D2.1 (Vázquez-Luis et al., 2022), information and dissemination campaigns, volunteer programs and citizen science have been carried out.

The situation in the Spanish coastal areas after the 2016 MME (Vázquez-Luis et al., 2017) remained mainly restricted to the two partially unaffected sites: Ebro's Delta (Alfacs Bay and Fangar Bay) and the coastal lagoon Mar Menor (Cabanellas-Reboredo et al., 2019; García-March et al., 2020). However, resistant *P. nobilis* individuals have been found in different locations along the coasts of Catalonia and the Balearic Islands. Thanks to citizen science and dissemination channels, these individuals continue to be found every year and can be evaluated through periodical monitoring.

Mortality reached the coasts of France the following year (autumn 2017), where it devastated the Natural Reserve of Scandola and National Park of Port-Cros populations during 2018. The remaining alive *P. nobilis* populations are in coastal laggons located in Occitania (Leucate, Thau, Fos: Rhône's delta) and Corsica (Diana) where they are subject to periodic monitoring to assess their status (Foulquié et al., 2020).

Although the first description of MME in the Italian coast was in 2019 (Carella et al., 2019), a scattered mortality situation was recorded during 2017 and 2018 in Sorrento, Positano, Vico Equense and Cilento. During the following years, mortality was reported in other regions of Italy like Sardinia and Tuscany (Carella et al., 2020; Scarpa et al., 2020).

An evidence of *P. nobilis* mortality (40% of individuals) was first recorded in the western Ionian Sea (Italy) in 2017, followed by very high mortalities (up to 100% mortality in 3 months) in the summer 2018. Mortality rates exceeded 80% in the eastern Ionian Sea (Greece) by august 2019, and kept increasing at that time. Even the National Marine Park of Zakynthos (NMPZ) was affected in 2020, where no high mortality rates (40%) were recorded the previous year (Zotou et al., 2020).

In a broader context, the mortality has reached practically all the Mediterranean basin in the open sea, and some sanctuary areas host *P. nobilis* population in particular conditions. Survivors/resistant individuals are

