

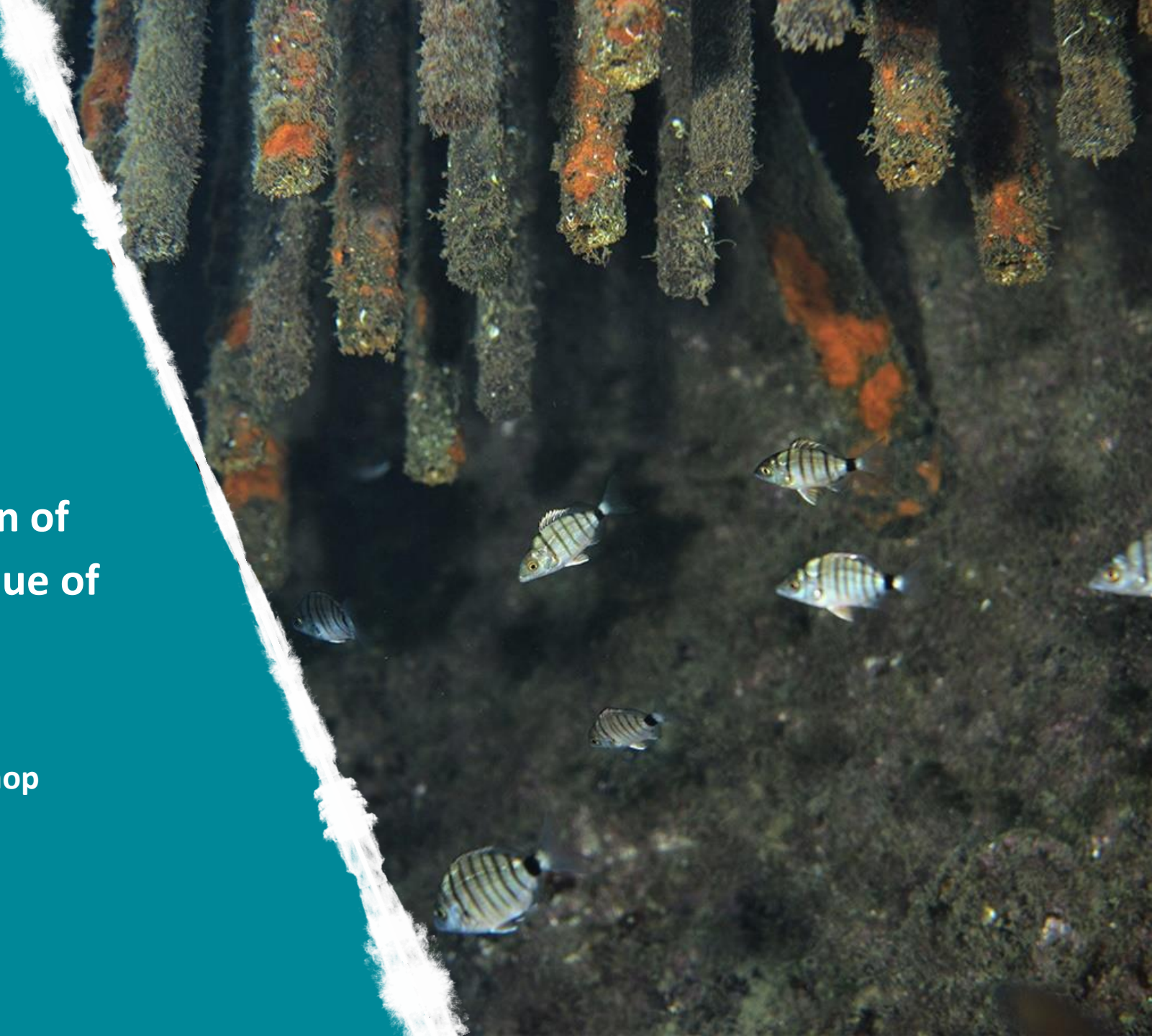


Artificial fish nurseries

Rehabilitation and restoration of marine habitats: the added value of artificial structures

Mission Ocean EU Blue Parks workshop

- March 7th 2024-



Who are we?



1,5M€
Turnover 2023

- 21 years of experience (founded in 2003)
- Main office in Montpellier & one marine station in Marseille
- Dynamic team of, marine biologists, engineers, technicians and professional divers (50%)



Activity

- Ecological engineering in marine environment.
- Expert in this field



Solutions

- High end solutions ready to use, ecologically efficient and scientifically demonstrated.
- 3 patents



Core expertise

Design & creation of 100% operational solutions to give ecological functions to artificial structures & boost fish population

Scientific partners: UPVD CNRS, IFREMER, CREM, EXETER, Copenhagen University, Syddansk University, Aarhus Univ...



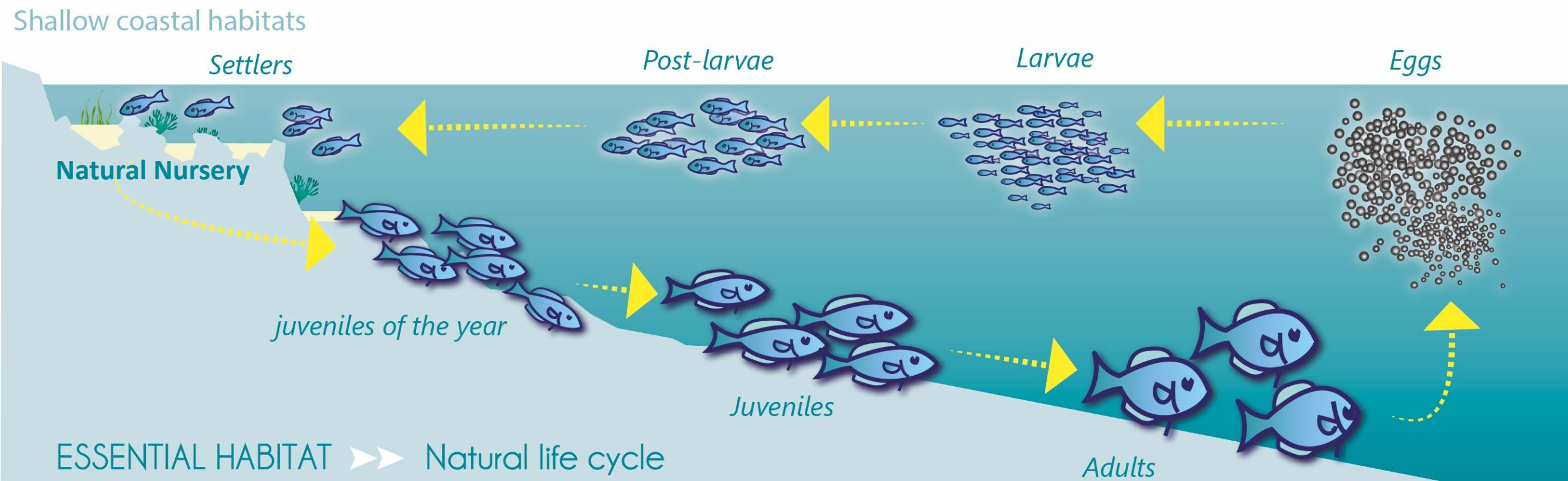
○ Institutional partners: French Water Agency, ADEME, Office Français de la Biodiversité, WWF Denmark...



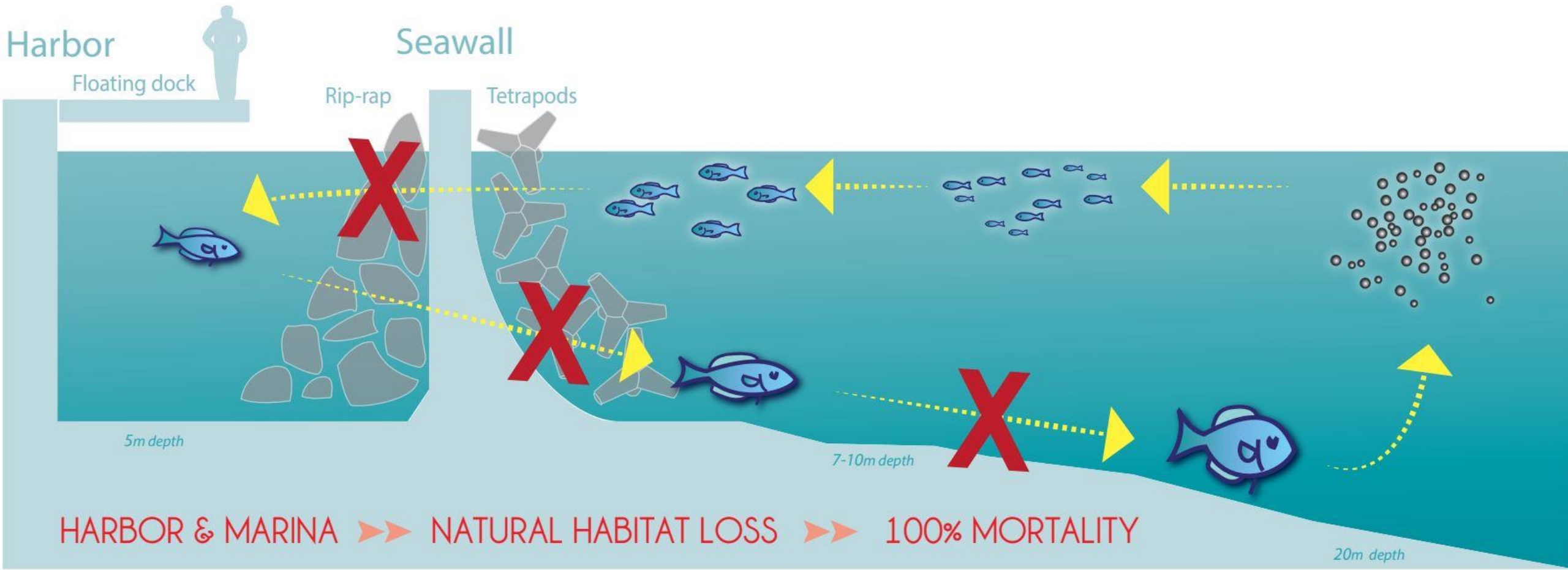
Member of:



YESTERDAY *in a natural environment, the fishes rely on adapted habitats during their different development stages. Shallow coastal areas are essential to their life cycles.*



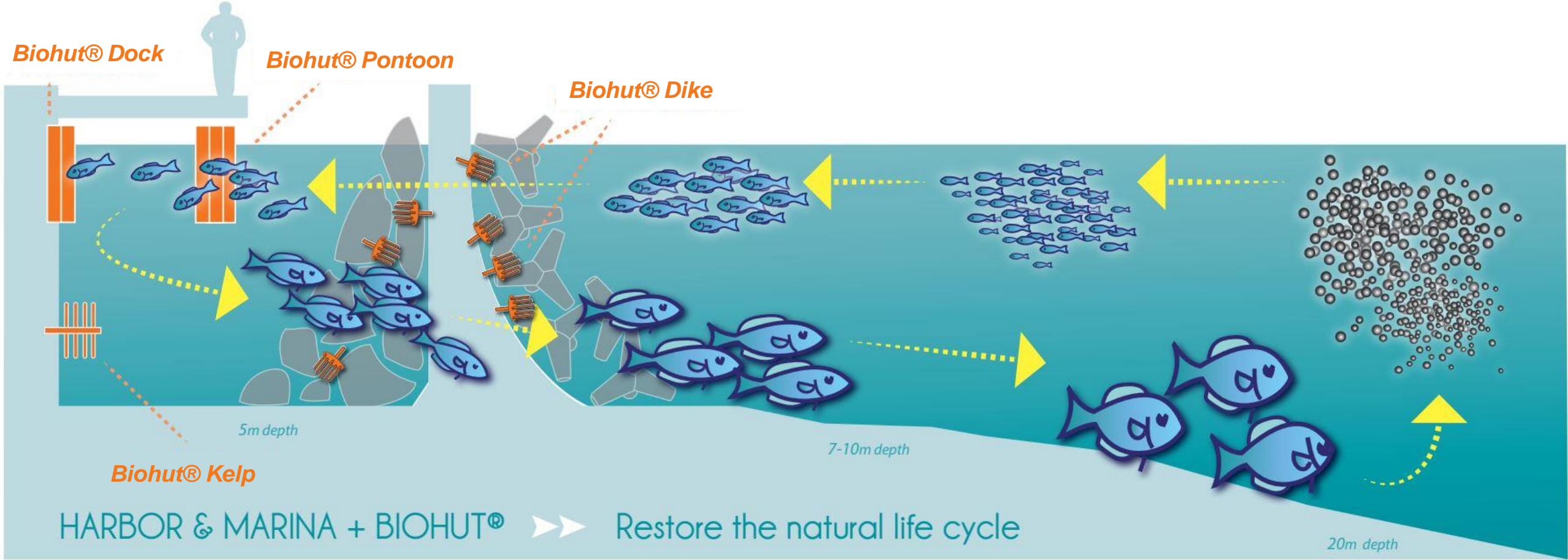
TODAY *The coastal infrastructures can impact the nursery functions of the shallow water areas, deeply modifying the essential habitat of the post-larvae. This pressure leads to higher juvenile mortality and to a reduction of adult populations.*



Artificial ecosystems to restore nurseries in port infrastructures

TOMORROW

Biohut habitats rehabilitate the nursery functions that coastal development has impacted, and thus allow to rebalance the natural cycle.



A fine scale habitat with the key nursery functions

Labelled Origin France

Made of steel and natural substrate (shell)

Economy of functionality

22kg weight (13kg in the water)

Dimensions 80 x 50 x 36 cm





Helping early life stages of many fish species



5500 Biohut® installed since 2013 in 14 countries

Experience

54 ports equipped in the European area and surroundings in 2023

Rotterdam Keilehaven - NL
 Hagesteijn - NL
 Lobith - NL
 Lelystad - NL
 La Haye - Scheveningen - NL
 Aarhus - DK
 Grenå - DK
 Copenhagen - DK
 Antibes - Port Vauban - FR
 Argelès - FR
 Bénodet - FR
 Bonifacio - FR
 Cannes - Port Canto - FR
 Cannes - Vieux-Port - FR
 Canet en Roussillon - FR
 Cap d'Agde - FR
 Cap d'Ail - FR
 Fréjus - Port Fréjus - FR
 Golfe-Juan - Port de Camille rayon - FR
 La Forêt-Fouesnant - FR
 La Londe Les Maures - FR
 Leucate - Port Leucate - FR
 Marseillan plage - FR
 Marseillan Ville - FR
 Monaco - Port de Fontvieille - FR
 Monaco - Port Hercule - FR
 Narbonne - Port de Narbonne plage - FR

Roquebrune-sur-Argens - Port des Issambres - FR
 Antibes - Port Gallice - FR
 Saint Florent - FR
 Mèze - FR
 Saint-Tropez - FR
 Stes Maries de la Mer - Gardian - FR
 Valras - FR
 Vendres - Port du Chichoulet - FR
 San Feliu de Guixols - SP
 Côte d'Ivoire
 Valras ORB Sérignan - FR
 Taarbaek - DK
 Lillebaelt - Middelfart - DK
 Lillebaelt - Fredericia - DK
 Lillebaelt - Skaerbaek - DK
 Lillebaelt - Kolding - DK
 Amsterdam - NL
 Port-Vendres - FR
 Saint-Martin - Galisbay - FR
 Saint-Martin - Marine Anse Marcel - FR
 Saint Martin - Fort Saint Louis - FR
 Rouen - FR
 Marina de Lagos - PO
 Théoule sur Mer - FR
 Port d'Amchit - LB

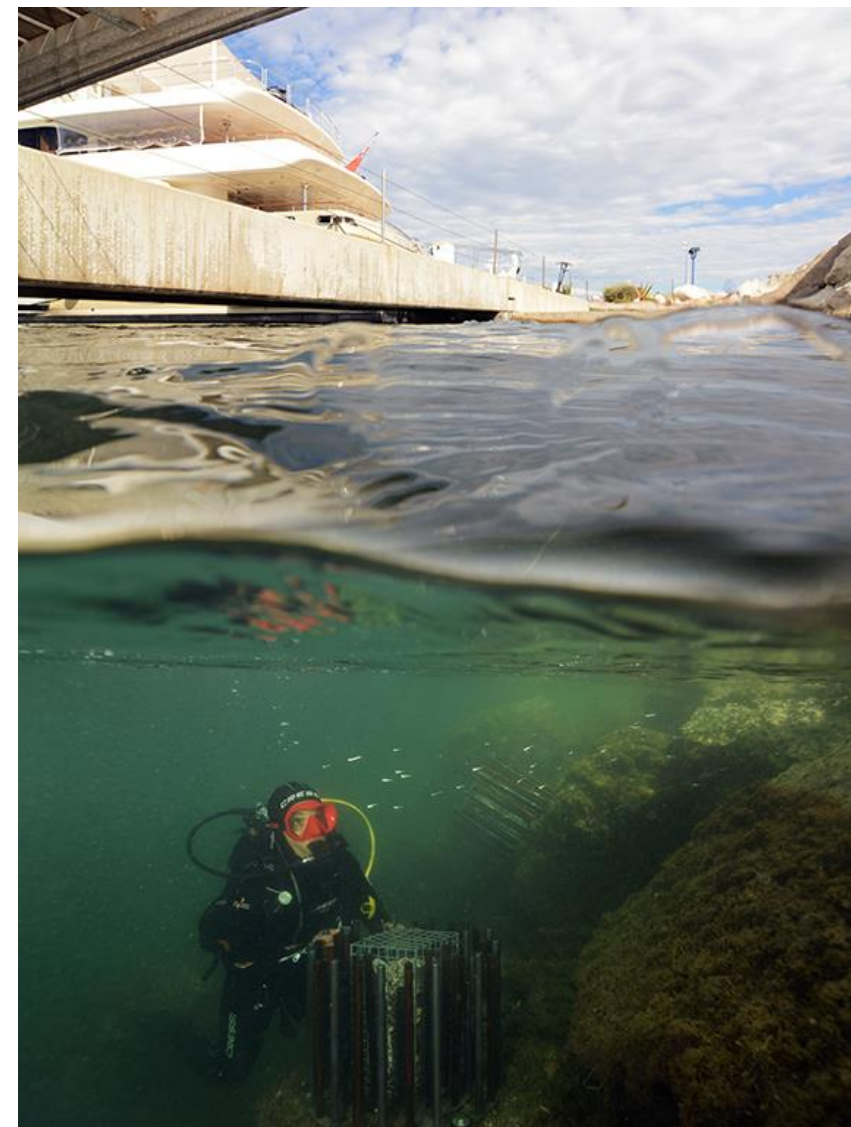


- **NAPPEX** : The network of port equipped with Biohut to rehabilitate nursery functions
- **3 PhD thesis and 11 publications**
- In adequation with the European objectives of restoration of Nature for 2030

+ 1 PhD thesis about floating ecosystems- UROS (OFB/IRSTEA)

+ 1 PhD thesis about trophic connectivity (ECOSEAS)

=> Documents available on www.ecocean.fr/documents



Fishes:

205.000 observations
+125 species



Invertebrates:

130.000 observations
+400 species



Fixed fauna and flora:

2.500 observations
+60 taxa



+550 species observed



⇒ Different patrimonial and umbrella species (groupers, seahorses, cod, saithe, eel, pike...)

The ecological functionalities of the Biohut are also easily completed by:

- **Educative activities** for youth about the potential role of ports for Biodiversity
- **BioObs** : monitoring activities to assess and touch the species present in the Biohut
- Development of a **range of games** dedicated to aquatic biodiversity and its functions





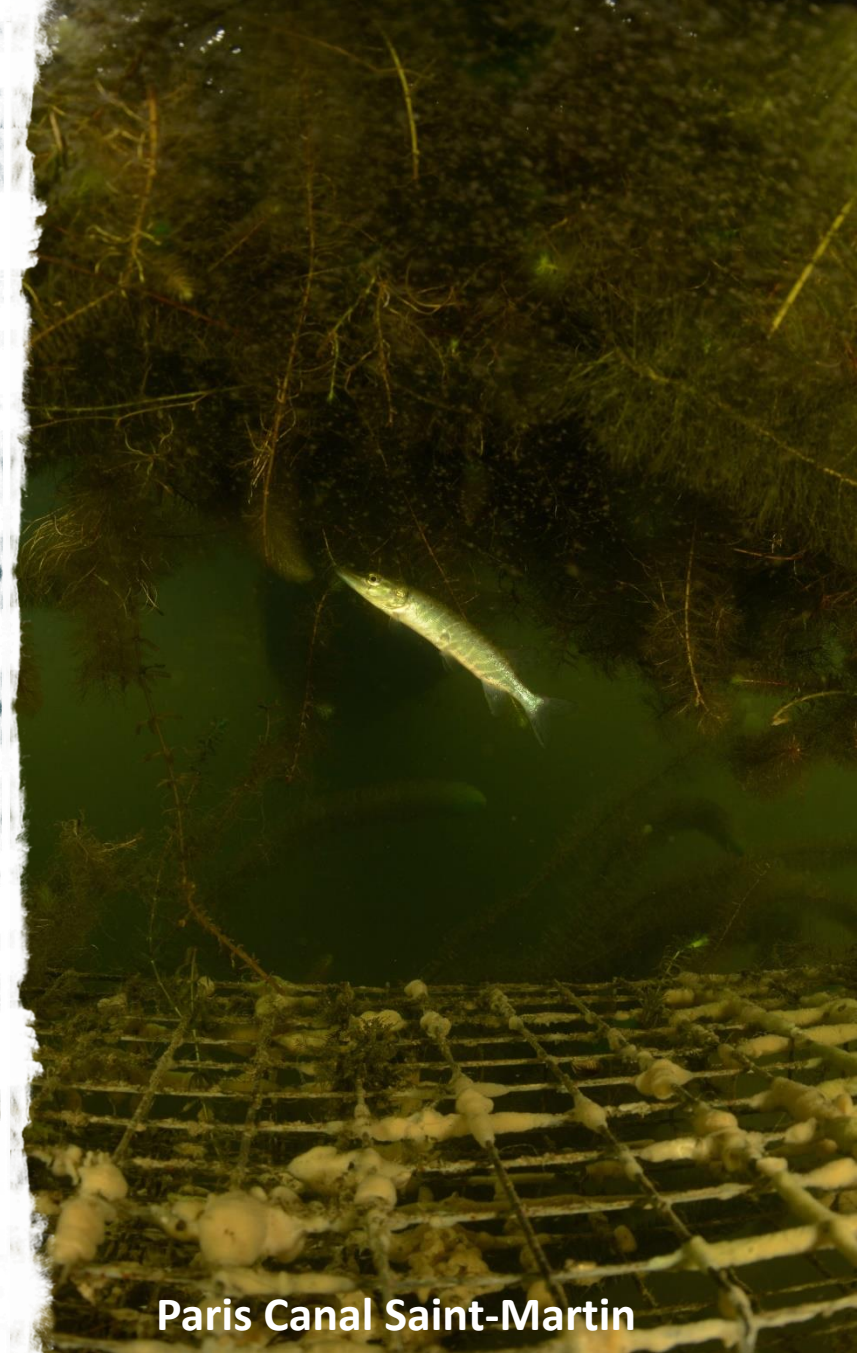
Complex habitats for rehabilitation and restoration of artificialized freshwater ecosystems



Port of Brussels



Serre-Ponçon Lake



Paris Canal Saint-Martin



A new range of solution for inland and offshore energy infrastructures



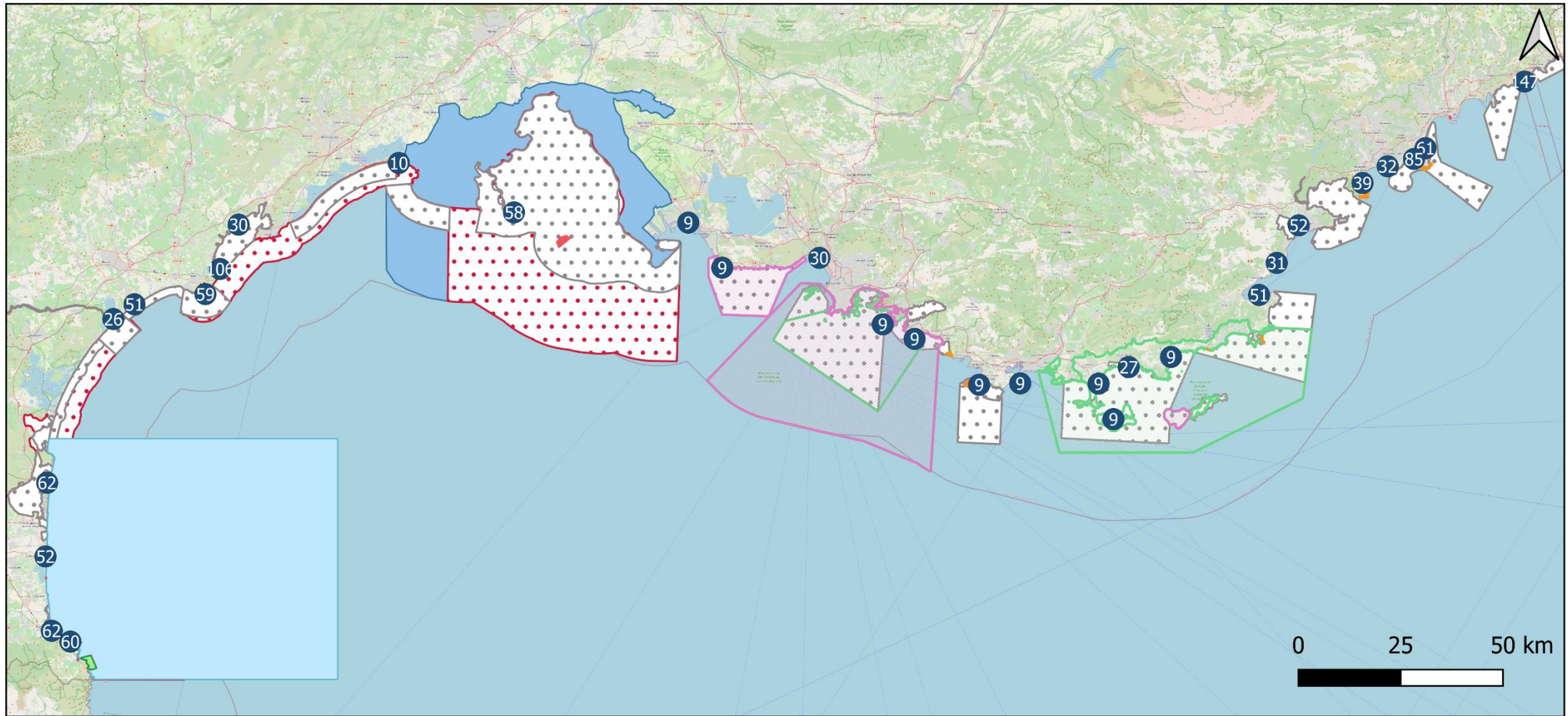
Blue Oracle OCG Data



Floating photovoltaic



BoB Observation buoy



ARTIFICIAL NURSERIES

- Biohut©

MARINE PROTECTED AREAS

- National nature reserve
- Biotope protection area
- Public maritime domain (Conservatoire du littoral)

- Specially protected area of Mediterranean importance
- National park
- Marine nature park
- Biosphere reserve
- Special protection area (N2000, DO)
- Special Area of Conservation (N2000, DHFF)



Raised to be wild

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