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# NATURAL ART REEF (NAR) VALUE PROPOSITION

## LIVING LABS FOR CO-CREATING SOLUTIONS FOR ECOSYSTEMS RESTORATION

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### Who are we

[Natural Art Reef \(NAR\)](#) is a research centre and key local stakeholder in Mediterranean coastal management. We specialise in habitat regeneration and ecosystem-building marine infrastructures through nature-based solutions, creating new ecological substrates that function as ecological stepping stones, biodiversity hotspots and coastal resilience elements.

NAR brings together:

- **Scientific expertise** in marine ecology and ecological engineering;
- **Operational capacity** with vessels, professional scientific divers and port-based infrastructure;
- **A long-term ecological research programme**, with continuous monitoring;
- **A deep local network** of fishers, authorities, NGOs, research institutions and schools.

This combination makes NAR a **uniquely positioned partner** for European consortia seeking real-world conditions to design, test and scale ecosystem restoration-supporting innovations.

### El Biotop Living Lab

[El Biotop](#) is a flagship marine Living Lab located off the coast of Torredembarra (Catalonia, Spain). Within a **licensed concession area of nearly 20,000 m<sup>2</sup>** dedicated to ecological innovation, scientific research and nature-based marine solutions, El Biotop consists of a **large rocky structure made of 40 tones of calcium carbonate rocks**. Designed to regenerate and complement natural habitats and enhance biodiversity including gorgonian forests, sea meadows and rocky reefs, El Biotop provides a unique realistic, dynamic environment ideal for **testing, co-developing and evaluating innovative approaches to ecosystem restoration goals**.

## Experimental multi-site testing

El Biotop has become a **scientific and technological hub**, providing a **real-life testing facility** for academic collaborations for the development of protocols and guidelines supporting ecosystem restoration on novel substrates. Beyond being an experimental system, **El Biotop functions as an oceanographic laboratory**, enabling the generation of high-resolution biological and environmental data, including real-time measurements, under fully operational coastal conditions.

Over the last two years, **high-resolution biological and environmental monitoring** have produced a robust baseline on biological indicators under national and international frameworks. The registration of **16 protected species** provides tangible evidence of the site's capacity to support ecological conditions compatible with **favourable reference areas and good conservation status**, contributing to the assessment of **satisfactory indicator levels**. At the same time, El Biotop demonstrates how ecosystem-building infrastructures can operate as **functional biodiversity corridors**, enhancing connectivity between newly created habitats and surrounding natural ecosystems, in line with the **EU Biodiversity Strategy for 2030**.

Its ecological heterogeneity allows for controlled **comparative trials**, with 10 to 20 experimental multi-site testing, technological deployment, social/governance experiments and restoration-supporting pilots. This flexibility supports both **scientific experimentation and applied innovation**, including ongoing collaborations related to benthic habitat dynamics, fish assemblage monitoring, coraligenous systems, gorgonian recruitment and applied nature-based solutions, developed together with universities, research groups and technical partners.

## Viability and social uptake

**El Biotop operates under fully real ecological and socio-economic conditions**, where investment, applied research and local economic activity already converge. The site is embedded in an established network of **public and private investors, local authorities, fishers, tourism operators and civil society**, actively supporting habitat regeneration initiatives linked to the emerging **blue bioeconomy**.

Economic mechanisms focus on translating ecosystem regeneration outcomes into **measurable blue capital returns**, aligned with EU biodiversity and climate objectives. Ongoing collaborations, co-funded actions and local economic engagement enable the **testing of capital return strategies associated with nature-based marine solutions**, including reinvestment models, ecosystem service valorisation and biodiversity-linked incentives, in a setting specifically designed for that purpose.

## Co-creation, dissemination and societal impact

NAR works alongside long-term stakeholders to make El Biotop a **socially embedded Living Lab** actively involved in co-creation, dissemination and uptake of solutions. As a **unique element at a global scale**, El Biotop has become a flagship platform for **knowledge transfer to sea users and the wider community**, engaging diving centres, fishers, municipal actors and citizens in applied monitoring, shared protocols and **science-based decision-making**. Through sustained **engagement with schools, local communities and sea users**, the Living Lab promotes a deeper understanding of marine ecosystems, the value of habitat regeneration and the role of society in supporting long-term stewardship and sustainable coastal management.

# Key Strengths

## Strength 1 — Logistical and operational capacity

NAR operates from the Port of Torredembarra, with access to vessels, professional scientific divers and field infrastructure, enabling the installation, maintenance and monitoring of experimental setups, sensors, moorings and pilots with high temporal resolution.

## Strength 2 — Continuous and historical datasets

More than **100 scientific dives per year** support continuous ichthyological, benthic and coraligenous monitoring, generating long-term datasets that go beyond punctual campaigns and allow direct observation of ecological processes.

## Strength 3 — 20,000 m<sup>2</sup> concession for experimentation

The licensed area allows rapid deployment of experimental actions aligned with ecological innovation, significantly reducing administrative barriers and increasing feasibility for long-term Living Lab activities.

# Relevant Experiences

El Biotop has already been integrated as a **real-life experimental and monitoring site** within several projects supported by **European funding instruments**, demonstrating NAR's capacity to operate under EU requirements for data quality, stakeholder engagement, reporting and impact-oriented implementation.

- [MERPECE: Marine Ecosystem Recovery and Participatory Ecological Characterisation](#)  
EU funding framework: *FEMPA (European Maritime, Fisheries and Aquaculture Fund)*  
Lead entity: Natural Art Reef (NAR)
- [MARLIN: Marine Monitoring, Awareness and Resilience through Local Integrated Networks](#)  
EU funding framework: *FEMPA (European Maritime, Fisheries and Aquaculture Fund)*  
Lead entity: Natural Art Reef (NAR)
- [OCEAN CITIZEN: Methodologies for Gorgonian Ecosystem Monitoring and Regeneration](#)  
EU funding framework: *HORIZON Europe*  
Lead entity: Università di Salento (UNISAL)
- [REDMED+: Marine Reserves for the Conservation of biodiversity](#)  
EU funding framework: *Interreg POCTEFA*  
Lead entity: Universitat de Barcelona (UB)

