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Conservation status targets: Marine restoration in Italy - The Marine Ecosystem Restoration project in the framework of the Italian Recovery and Resilience Plan (PNRR)

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PNRR Marine Ecosystem Restoration Project - MASE & ISPRA

Designed to address the following NEEDS

- ***CBD's Post-2020 Biodiversity Framework***
- **Respond to the EU Biodiversity Strategy to 2030:**
  - Protect 30% of national seas,
  - Strict Protect 10% of national seas,
  - **Conservation status target: <u>non deterioration and 30% conservation improvement of species and habitats in unfavorable / non-secure status</u>**
  - The EU's Nature Restoration Law (Nature Restoration Plan)
- Enhance national marine ecosystem observation systems
- Expand knowledge on benthic habitats of conservation interest **to define and implement** protection and **restoration actions**

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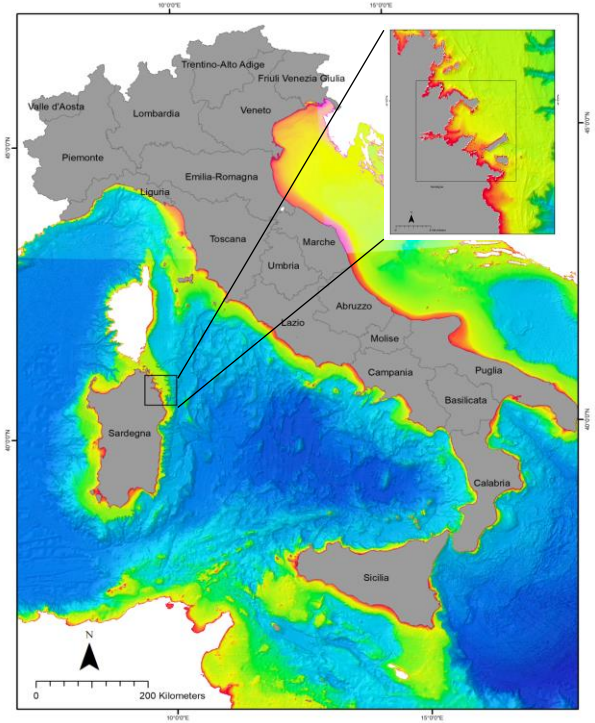
PNRR Marine Ecosystem Restoration Project - MASE & ISPRA consists of **37 large-scale interventions**

Targets

- **Mapping 90% of marine habitats of conservation interest** (By 2026), coastal (seagrasses meadows), and seamounts (habitat 1170), **to have the necessary information to identify new areas to protect** (**passive restoration**);
- Reinforcement of the national marine research and monitoring system in Italy with the involvement of key actors (Public Administrations, Research Institutions, CCPPs, MPAs, MMIs, etc.);

Interventions

- Implement non-stationary and *in situ* marine and marine-coastal ecosystem observation systems;
- Mapping coastal and deep-sea marine habitats of conservation interest (the new mapping of seagrass distribution & the majority of the seamounts in the Italian waters);
- **Implementing ecological restoration activities of benthic habitats through passive** (setting up of buoy fields to avoid the impact of anchoring on protected benthic habitat) **and active measures** implementing, in sites which are in a degraded condition, **active restoration actions of habitats of high conservation value and interest** (**seagrasses; coralligenous, *Cystoseira* reefs, Mediterranean oyster banks**)



MER - Active restoration actions on Seagrasses, *Cystoseira* spp., coralligenous habitats

Interventions are aimed at implementing **active restoration** actions of habitats **of high conservation value** and interest, **in sites which are in a degraded condition**, belonging to 7 different Italian Regions

with the reintroduction of species in the habitat and referring to positive restoration experiences developed within targeted research projects, such as

- *Coralligenous* (in Tuscany)
- seagrasses - *Posidonia oceanica* (in Latium, Sicily, Calabria, Apulia) and *Cymodocea nodosa* (in Friuli Venezia-Giulia)
- *Cystoseira spp.* (in Campania)

Some important elements defined to proceed with the implementation of restoration actions

- Criteria for selecting areas (at local scale)
- Approach to identify intervention sites at a meso scale
- Envisaged phases

Criteria for selecting areas for implementation of restoration work

1. Presence of **data and information on the extent and condition of the habitats of interest**;
2. Identification of any **disturbing elements** that have led to habitat degradation and **verification of their complete removal or minimization** prior to the implementation of interventions;
3. Existence of **previous experiences that have shown positive results**;
4. **Geographical distribution** with reference to the coverage of interventions in the three marine sub-regions (Western Mediterranean Sea, Central Mediterranean Sea and Ionian and Adriatic Sea).

Main phases and spatial areas of competence

Site identification - for the restoration site: *Ex ante* analysis of previous data, morpho-bathymetric and video-photographic surveys, analysis of coastal hydrodynamics and monitoring of hydrological conditions, *in situ* observations of environmental criticalities, *in situ* surveys: structural, functional and ecological descriptors of the habitat to be restored, Selection of macro-areas and restoration sites

Wide area (2-5km^2)

Site identification - for the donor site: *Ex-ante* analysis of previous data, morpho-bathymetric and video-photographic surveys, analysis of coastal hydrodynamics and monitoring of hydrological conditions, *in situ* observations of environmental criticalities, *in situ* surveys: structural, functional and ecological descriptors of the donor habitat; Evaluation of the distance from the restoration site (for *Posidonia* - taken from naturally detached or low-density bundles on natural grassland - and *Cystoseira*), Analysis of bycatch (for coralligenous)

Wide area (2-5km^2)

Selection of technique, Selection of biological material for restoration, **Restoration activities**

Restoration site (Posidonia 1000m^2 Cymodocea 250m^2, Cystoseira 500m)

Design and installation of systems for **surveillance activities** (camera and ordinances)

(10,000m^2)

Short-term monitoring (≤ 2 years) due to the duration of the NRRP

5% of the surface area of the restoration site

Replacement of failures, Decommissioning of restoration

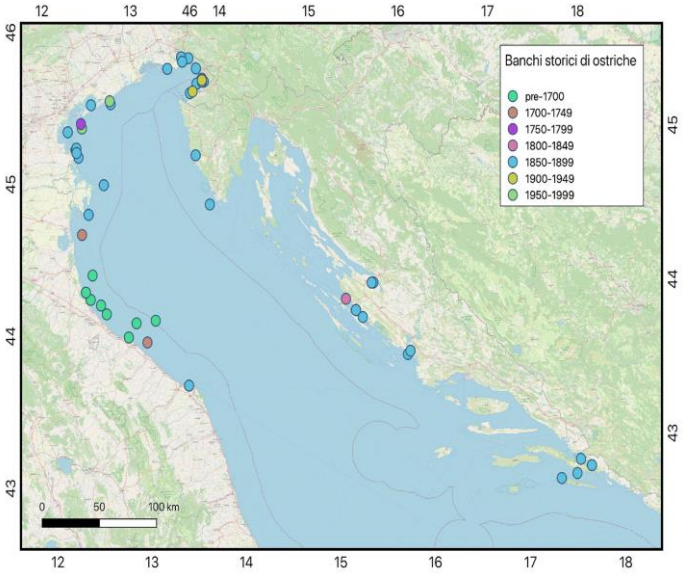
Restoration site (250–1000m^2-500m)

Environmental monitoring station on oceanographic buoy

Macro-area (10,000m^2)

MER - Active restoration actions on oyster banks (*Ostrea edulis*)

- Flat oysters are known to support biodiversity and a range of ecosystem services (from carbon sequestration to water cleaning, provisioning of biomass, etc.);
- Native oysters were common in the Adriatic Sea and large reefs were reported since mid 1500s till early 1900s;
- Due to habitat disturbance and overexploitation, flat oysters are now scattered and only by-caught in fisheries
- MER interventions are aimed at implementing active restoration actions of *Ostrea edulis* habitats in 7 sites along the Adriatic Sea coast



Sites selection

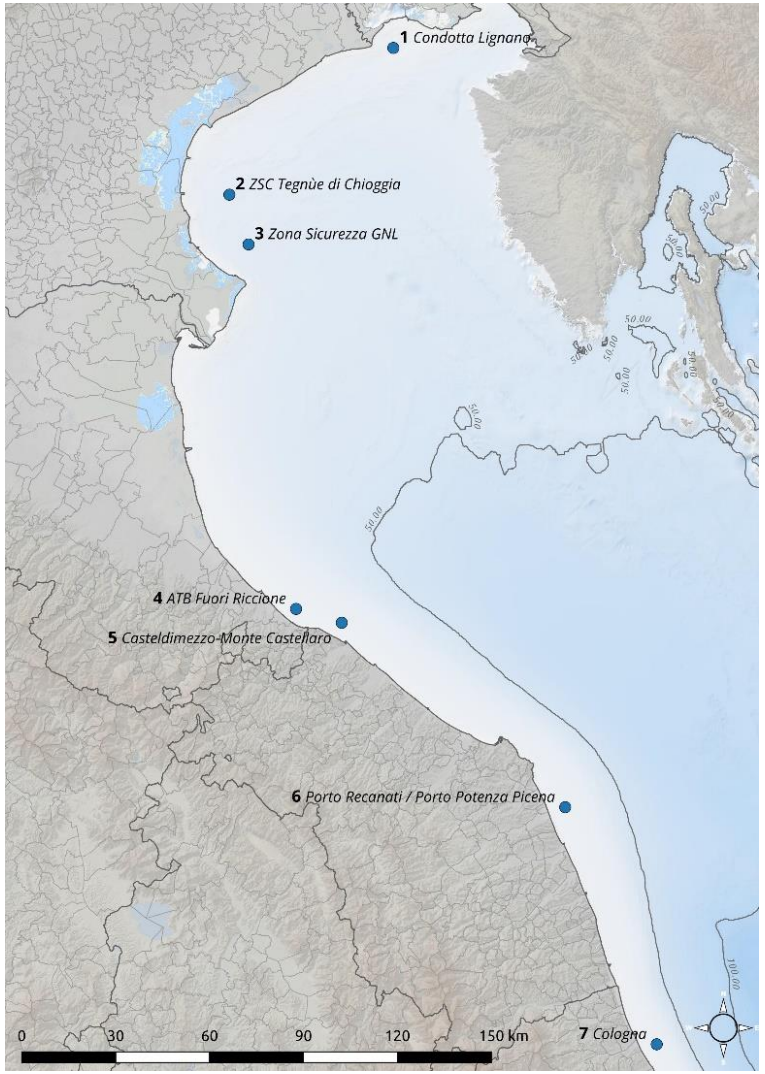
- **Friuli Venezia Giulia**: Lignano Sabbiadoro
- **Veneto**: SIC Tegnùe di Chioggia, Zona sicurezza Terminale GLN;
- **Emilia-Romagna**: ATB fuori Riccione
- **Marche**: Casteldimezzo-Monte Castellaro; Porto Recanati/Porto Potenza Piceno;
- **Abruzzo**: Cologna

Elements considered for site selection (among others)

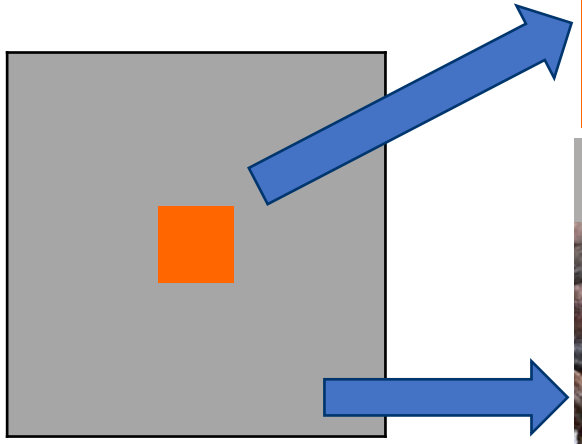
- Historical presence of the species;
- Depth, sediment, and ecological features of the site in relation to *O. edulis* ecology;
- Absence of active fishing disturbance/trawling
- Sources of adult oysters (controlled fishing and aquaculture) and biosecurity;
- Feasibility of the intervention.

Fine tuning of intervention's location

- Based on survey at sea and direct monitoring (executive project)



Approach



Adult oysters from controlled fishing and aquaculture deployed by the project on cages

New Substrate deployed by the project

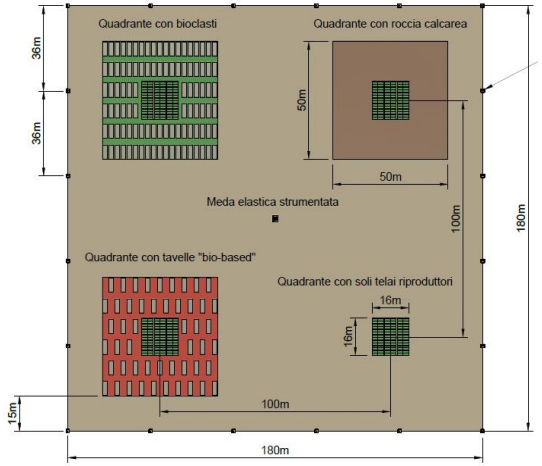
Cultch

Limestones

Bio-Based material

Main features

- 7 sites with 3 plots with three substrates (cultch, limestones, biobased material)
- ca. 1 ha of substrates per site;
- Oysters deployed on about 800 m^2 iron cages structures per site.



Keys for implementation

- Authorizations, site management, procurement process;
- Oysters' sources and biosecurity;
- Monitoring of oysters' health, env. conditions, effectiveness and impact of the interventions for oysters and as ecosystem services.

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Thank you

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