



**Promoting biodiversity
enhancement by
Restoration Of Cystoseira
POPulations
Financed by EU:
ROC-POP Life
(LIFE16 NAT/IT/000816)**



ROC·POP *Life*



ROC-POPLife is a concrete conservation action aimed at restoring habitat 1170 in two marine Natura2000 sites (which are Specially Protected Areas of Mediterranean Importance - SPAMI) through the reintroduction of *Cystoseira* sensu lato species. The project involves the implantation of cultured *Cystoseira* juveniles, with advantages in terms of time, cost and ecological impact.

The non-destructive approach allowed restoration without damaging donor sites, which is essential given the critical conservation status of the species. The method is suitable for large-scale application with replication in other Mediterranean regions. *Cystoseira* plays a key role in marine conservation by supporting biodiversity and food webs and sequestering large amounts of CO₂. All *Cystoseira* species are part of a Habitat of Community Interest: the different species are used for the definition of the Natura2000 Habitat1170 (Reef) and have priority in SPAMI MPAs. Several *Cystoseira* species are listed as Strictly Protected in the Annex I of the Bern Convention, and the Mediterranean Action Plan (Barcelona Convention) lists conservation of all but one *Cystoseira* species as a priority. *Cystoseira* is under surveillance as endangered by IUCN, SPA /RAC and MedPAN.

Finally, it is one of the indicators of ecological quality under the EU Water Framework Directive. Although these recent regulations have reduced the impacts, the lack of adults producing recruits and the low dispersal ability of *Cystoseira* hinder natural recolonization.



Specific objectives of the project

(a) Establish a protocol for culturing *Cystoseira* by collecting small fertile parts of thalli from healthy populations in the Portofino and Strunjan MPAs to ensure availability of juveniles for outplanting;

(b) Restore Habitat 1170 in the Cinque Terre and Miramare MPAs through outplanting of cultured juveniles and quantification of ecosystem services provided;

(c) Contribute to the achievement of Good Ecological Status in the target areas to demonstrate the effectiveness of the proposed measures in relation to the objectives of the EU Water Framework Directive.



PARTNERS



University of Trieste is the coordinating beneficiary and scientific coordinator for the project



University of Genoa is the scientific responsible for the implementation of restoration activities in the Ligurian Sea



Portofino MPA is one of the smallest but most effective Italian MPA and is the donor site for *Cystoseira amentacea*



Strunjan MPA is a slovenian Landscape Park and is the donor site of *Cystoseira barbata* and *C. crinita*



Cinque Terre MPA is located in the Ligurian sea; it is one of the receiving sites of restoration actions



WWF OASI is the managing body of Miramare MPA, one of the receiving site of restoration actions



Algowatt a medium-sized ICT company involved in supporting the partners for technological solutions.

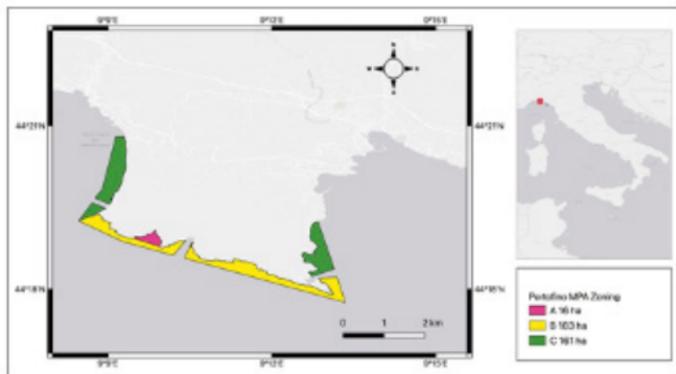


portofino

PORTOFINO MPA

www.portofinoamp.it

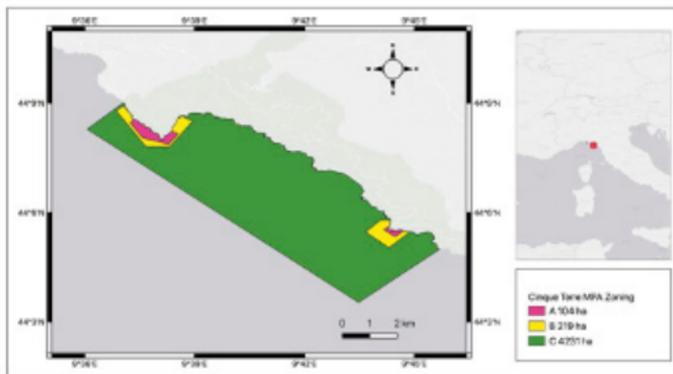
Portofino Marine Protected Area (MPA) was established in 1999. It encompasses the sea off the Portofino Promontory and is known throughout the world for the extraordinary beauty of its coasts. It is a destination for tourists from all over the world, especially for divers. The geomorphological features of the promontory have created an underwater environment very rich in crevices, reefs and small caves, favouring the development of a rich and very diverse benthic fauna and flora. The Portofino MPA is one of the most important marine areas in the Mediterranean for its coralligenous habitat and especially for the abundance of red coral (*Corallium rubrum*). The rocky bottom allows the development of a rich photophilic algal community and *Posidonia* meadows on sandy bottoms.



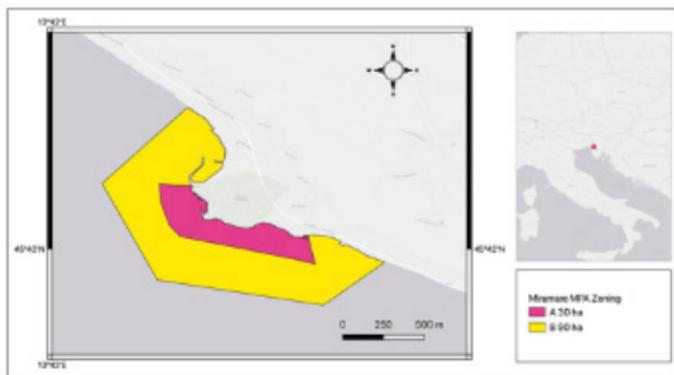
CINQUE TERRE MPA

www.parconazionale5terre.it

The **Cinque Terre MPA**, established by a ministerial decree of December 12th 1997, includes the municipalities of Riomaggiore, Vernazza, Monterosso and a small part of Levanto. The objective of the Cinque Terre MPA is to protect and enhance the natural, chemical and physical characteristics and the biodiversity of the sea and coastline in collaboration with the academic and scientific world. Studies, monitoring and scientific research programs are constantly carried out in the fields of natural science and environmental protection, with the aim of ensuring knowledge of the territory, but also promoting sustainable development, with particular attention to the valorization of traditional activities, local cultures, eco-friendly tourism and the use of socially sensitive categories.



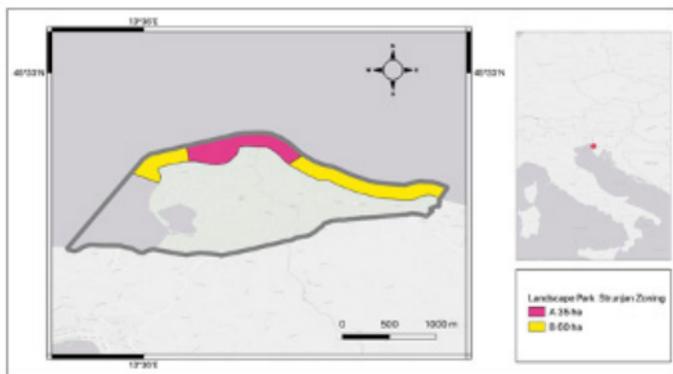
The **Miramare MPA** is an oasis of marine biodiversity, located at the foot of the Miramare Castle, in the heart of a Biosphere Reserve, recognized by UNESCO for its harmonious coexistence between Man and Nature. The Miramare Marine Park was established in 1973 as part of a state concession granted by the Trieste Harbour Master's Office to WWF Italy. The Miramare MPA was then officially established in 1986 by a ministerial decree entrusting it to the WWF Italy Onlus Association (DM. November 12, 1986). It was the first marine protected area established in Italy. Today, the Miramare MPA has the guardianship of 30 hectares of marine and coastal biodiversity, which are fully protected. In addition, there are other 90 hectares of buffer zone, established in 1995 on behalf of the Port Authority.



LANDSCAPE PARK STRUNJAN

www.parkstrunjan.si

Landscape Park Strunjan covers 428.6 ha and includes the longest section of natural coastline in the Gulf of Trieste and a geologically active flysch cliff rising above it. The Park embraces the Strunjan Peninsula with a 200-metre-long sea belt and the inner part of Strunjan Bay. It was established in 1990, in order to preserve valuable natural features, biodiversity and landscape diversity. The different types of seabed that characterise the marine zones form a collage of habitats with a lively flora and fauna. Hard bottom and rocks represent the dominant habitat type of the protected marine area. They harbour diversified algal communities, mainly associated with the genus *Cystoseira*, as well as some important biogenic formations of stony corals, including the largest reef in the Slovenian Sea off Cape Ronek.



ACTIONS



Collect the fertile parts of *Cystoseira* in healthy populations: *C. amentacea* var. *stricta*, from the MPA of Portofino (Ligurian Sea), *C. barbata* from the Strunjan MPA (North Adriatic Sea)



Establishment of mesocosms for controlled reproduction and cultivation of juveniles to be outplanted in Natura2000 areas



Replanting of *Cystoseira* populations in the Cinque Terre and Miramare MPAs, where historical occurrences are recorded and measures have been taken to mitigate the impacts that led to their loss



Maintenance of the outplanted populations and periodic monitoring to assess the success of reforestation efforts

The combination of actions will increase potential recruitment and ensure population replenishment and growth, as well as provide the opportunity to transfer the action to other areas.



TARGET Species

Intertidal zone

Cystoseira amentacea

Cystoseira amentacea var. *stricta* (now *Ericaria amentacea*), along with *Cystoseira compressa*, inhabits the midlittoral zone of relatively exposed rocky shores. *C. amentacea* is one of the most sensitive species classified as protected (Habitat Directive 92/43/EEC; Bern and Barcelona Convention), while *C. compressa* is the most tolerant species of this genus.

According to the European Water Framework Directive and the Marine Strategy Framework Directive, the quality of water bodies is classified based on macroalgal communities using the CARLIT index, which assigns the highest ecological value to *C. amentacea*.

The species thrives in a highly dynamic environment, in which desiccation potential is reduced by wave splash and the environmental stress gradient is intensified due to fluctuations in temperature and irradiance.



TARGET species

Subtidal zone

Cystoseira barbata

Cystoseira barbata (now *Gongolaria barbata*) inhabits shallow coastal waters with low hydrodynamic and is quite tolerant of eutrophic environments. It occurs together with *C. compressa* and *Ericaria crinita*.

Like all Mediterranean *Cystoseira* species (except *Cystoseira compressa*), *C. barbata* is included in the “List of endangered or threatened species” of the Barcelona Convention and its assemblages are considered habitats of critical importance in the EU (Directive 92/43/EEC).

Grazing, sedimentation and habitat destruction are some of the main threats to the long-lasting survival of this species.



CONCRETE ACTIONS

Intertidal zone

- 1 6 *C. amentacea* cultures
- 2 2044 cultured tiles
- 3 > 200.000 juveniles grown on tiles
- 4 Transport of 1214 clay tiles to receiving sites
- 5 100% survival of juveniles on tiles (at transport)
- 6 Ecological quality index
0,72 -> 0,9 (from good to high)





CONCRETE ACTIONS

Subtidal zone

- 1 6 *C. barbata* cultures
- 2 1622 cultured tiles
- 3 > 100.000 juveniles grown on tiles
- 4 100% survival of juveniles on tiles (at transport)
- 5 Transplantation in 26 zones with 50 tiles each
- 6 1000 m of restored coastline

MAIN ACHIEVED RESULTS



Cystoseira were reintroduced in the target MPAs. One kilometre of coastline was restored in the Miramare MPA and more than half a km of shoreline was restored in the CinqueTerre MPA.



In the MPAs, the number of thalli will increase thanks to the critical density created and the natural reproduction of the transplanted population.



MAIN ACHIEVED RESULTS



The new *Cystoseira* forests will form an ecological network with a cascade of positive effects on the MPAs by restoring functions (refuge/food for fauna, food supply, water oxygenation, etc.).



The process activated with the restoration of *Cystoseira*, an indicator of good ecological quality, has already positively changed the ecological status of the target MPAs.



COMMUNICATIONS



Establishment of network:

More than fifty organisations were involved in the implementation of the project activities during the more than 80 events.



Reached public:

- > 1,000,000 citizens
- > 2,000 researchers
- > 200 divers and free divers



Production:

- 3,400 brochures
- 3,000 leaflets
- 3 promotional videos



Website and social networks:

- > 300,000 visits
- > 950 followers on Facebook
- > 300 posts





PRESS RELEASE

- 2017, Sep 23, IL PICCOLO - newspaper
- 2018, Mar 20, IL PICCOLO - newspaper
- 2018, Apr 5, Corriere della Sera - newspaper
- 2018, Apr 26, Il Secolo XIX – newspaper
- 2018, May 21, IL PICCOLO - newspaper
- 2018, Jun 1, RADIO RAI FVG RADAR Show
- 2018, Jun 28, Repubblica – newspaper
- 2018, Jul 4, Telequattro TVCHANNEL Interview
- 2018, Oct 23, RADIO RAI FVG Interview
- 2018, Oct 23, TVKOPER Slovenian TV interview
- 2018, Nov 16, RAI GALILEO interview
- 2019, Mar 29, VITA NUOVA – newspaper
- 2019, May 13, cittadellaspezia.com – Onl.News
- 2020, Mar 24, IL PICCOLO – newspaper
- 2020, Mar 25, IL PICCOLO – newspaper
- 2020, May 8, RTVSLO – SLOV. TV Interview
- 2020, May 25, RAI FVG Interview
- 2020, Jul 20, 2020 - Secolo XIX – Newspaper
- 2021, Mar 21, IL PICCOLO – newspaper
- 2021, Apr 23, TVKOPER – Slov. Tv interview
- 2021, May 24, LEONARDO TGR interview
- 2021, Aug 19, PRIMORSKI – newspaper
- 2021, Nov 12, IlPICCOLO - newspaper

ROC-POP*Life*

www.rocpoplife.eu
facebook.com/ROCPopLife



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GREEN TECH SOLUTIONS



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