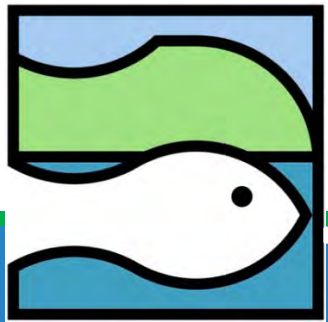


Restoring our marine environment to tackle Climate Change



Lorenzo Merotto – Scientific Technician



Acquired Degree in Environmental Marine Science in 2014.

Has been working in Portofino MPA since 2017.

Main field : study of climate change effects on Portofino MPA through monitoring and Vulnerability Assessment and developing of adaptation plan.

- Experience in engagement of the key stakeholders, as diving and professional fishermen
- good skills in underwater field activity, dissemination
- expertise in management of EU projects such as LIFE (ROC-POPLife, ReLife), Interreg Maritime (NEPTUNE) and Interreg MED programs (MPA-engage, MPANetworks)

Portofino Marine Protected Area

Organization: Consortium of Management made up by the municipalities that are part of the territory of the MPA, the University of Genoa and the Metropolitan City of Genoa

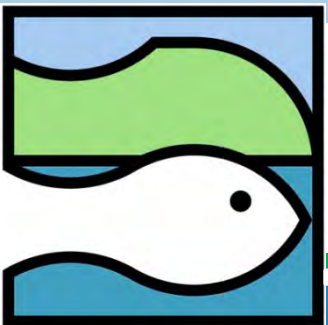
Date of Institution 1999

Surface: **346** ha

Coast morphology: Cliff

Marine habitat:

Rocky bottom, coralligenous, Seagrass meadows

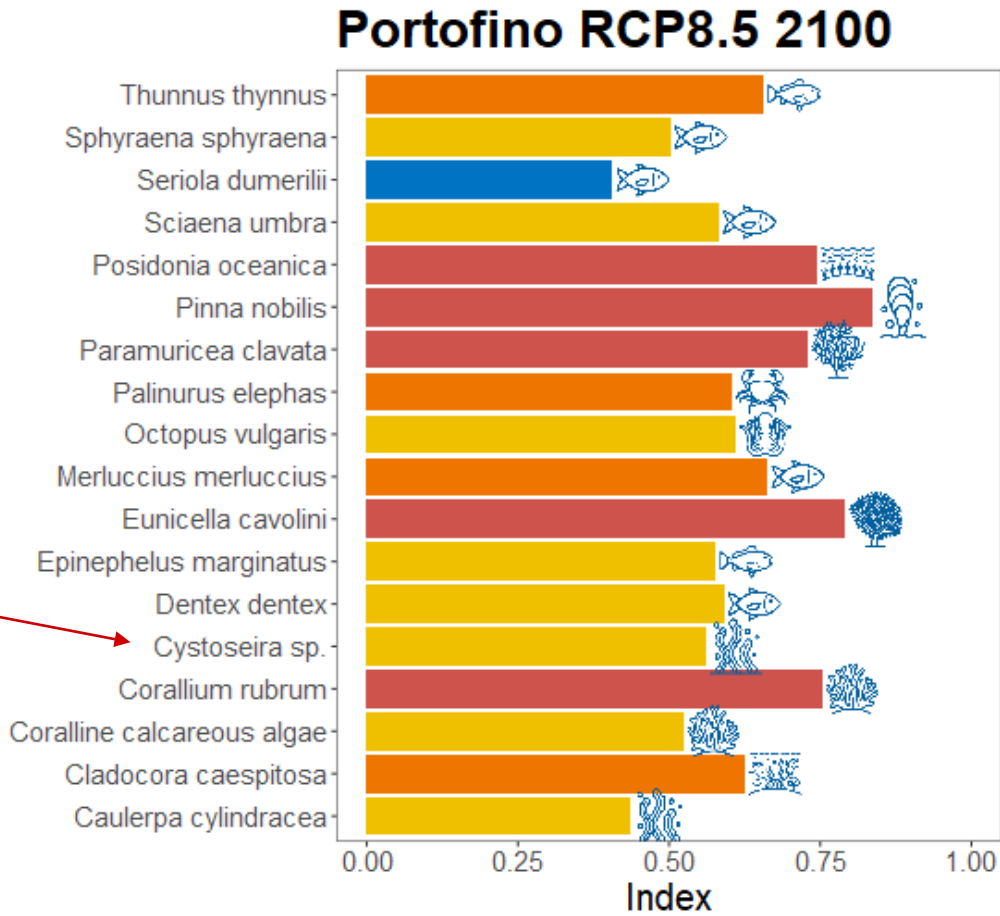
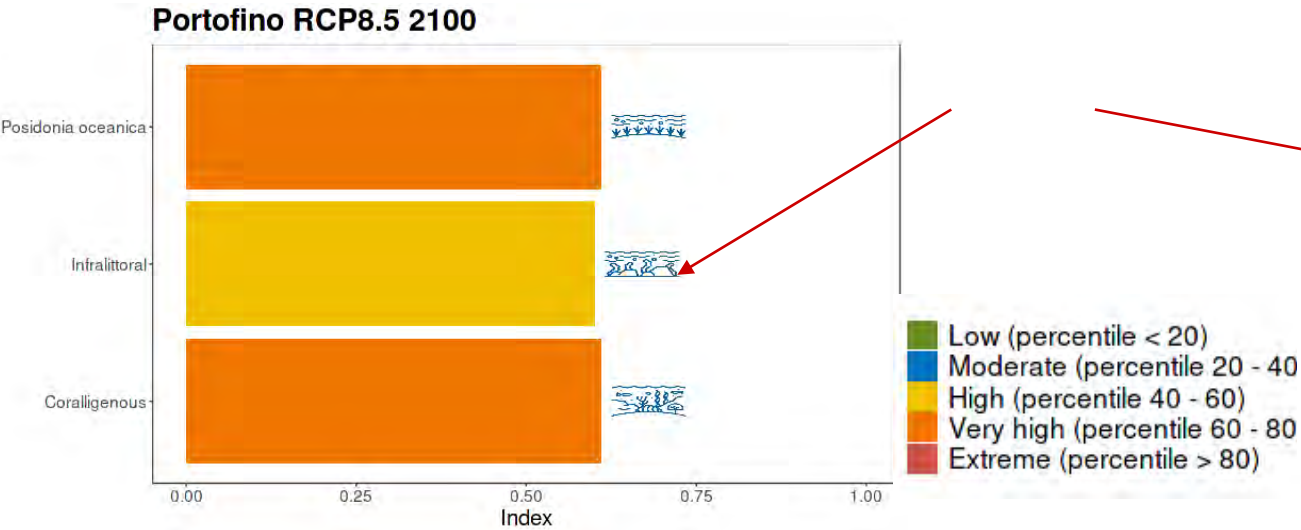


EUROPARC
F E D E R A T I O N

Vulnerability assessment and Value of Biodiversity

Natural Capital and Vulnerability assessment in Portofino MPA

HABITAT	SURFACE (hectars)	VALUE (M€)
Coralligenous	18,3	2
Posidonia meadows	167,9	4
Rocky habitat (Photophilus algae)	42,7	2,5



An healthy and intact environment is less sensitive and more resilient to climate change effects

Implementation of protection measures



Restoration



Projects aimed to restore intertidal zone (habitat and species)



LIFE16 NAT/IT/000816



LIFE15 NAT/IT/000771

Habitat 1170 - Cliff

Cystoseira spp.

Structuring brown seaweed forming coastal forests, which are "biodiversity reserves".

Threatened by pollution, changes in coastline, climate change, changes in life cycles, herbivore action



Promoting biodiversity enhancement by Restoration Of *Cystoseira* POPulations

The project is carried out simultaneously in the Ligurian and Adriatic Seas by means of ex situ outplanting, which makes it possible to restore the recipient sites without damaging the adults in the donor sites.





Restoration of *Cystoseira spp* in Ligurian Sea and Adriatic sea

Collection



Once mature, only the fertile apices of the adults are taken, so the population of the donor site is not affected.

Reproduction

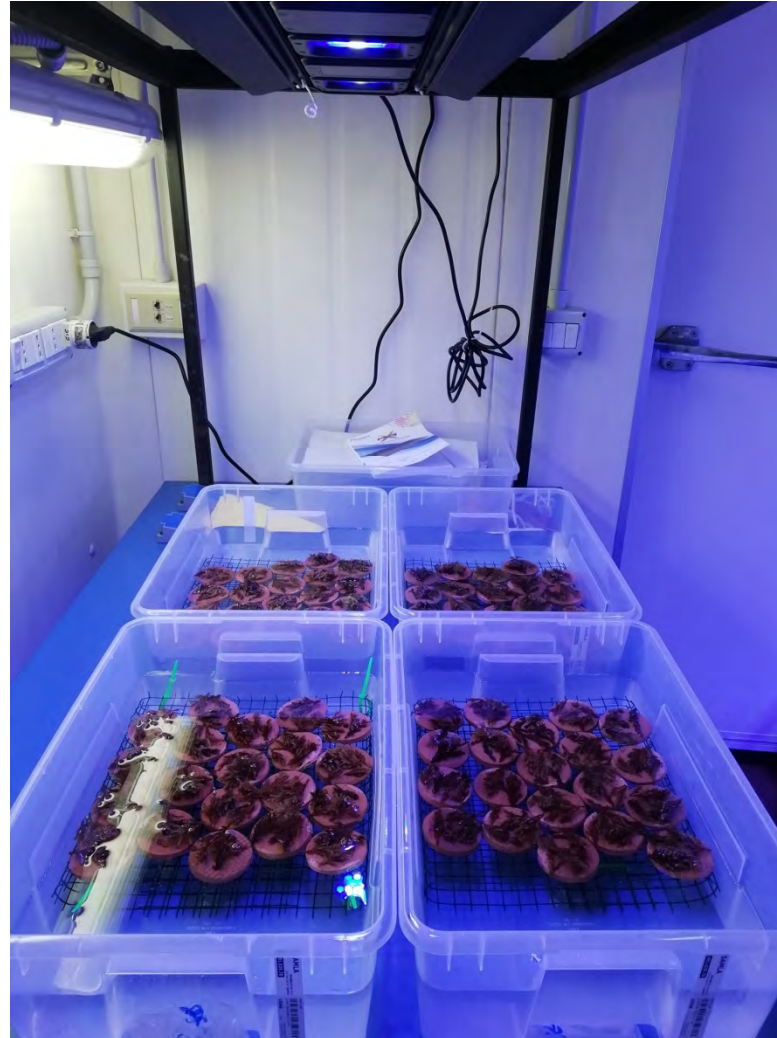
Once brought to the laboratory, the apices are 'cleaned' and the different apices brought into contact so that gametes meet and fertilization takes place.

The new individuals will settle on the sub-stratum of terracotta discs.



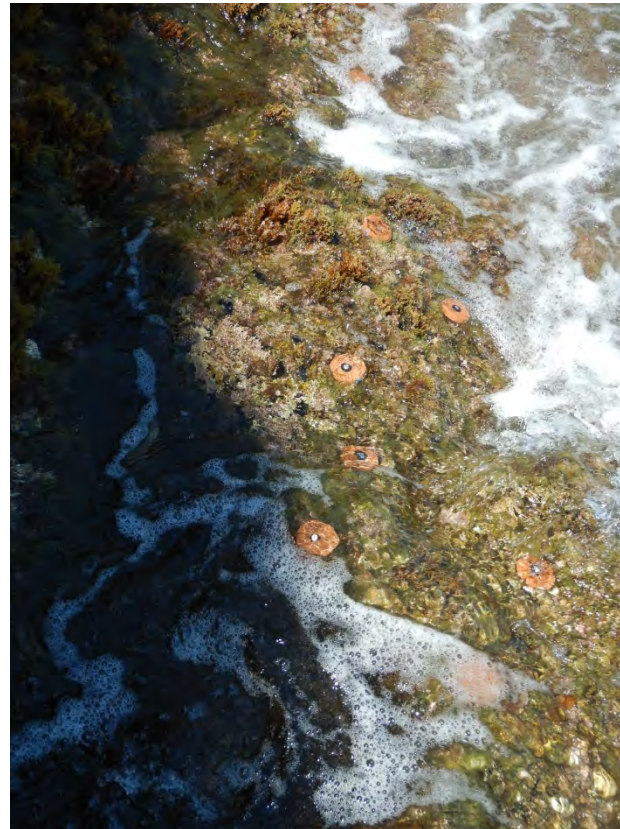
Growth

The discs with the new individuals are put in an ideal conditions to grow and to be reintroduced into the receiving site.



Restoration of *Cystoseira* spp in Ligurian Sea and Adriatic sea

Replanting



Re-establishment of the Ribbed Limpet (*Patella ferruginea*) in Ligurian MPAs by Restocking and Controlled Reproduction



Patella ferruginea

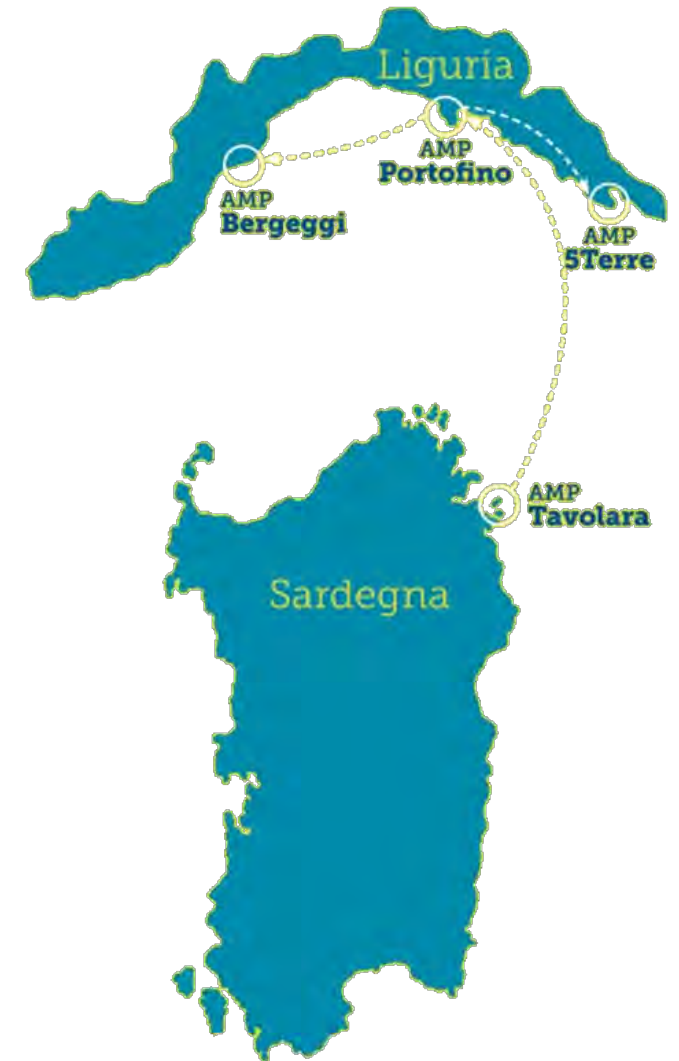
Gastropod mollusk almost extinct along the Ligurian coast

Human consumption (including use as fishing bait), pollution and complicated life cycle, Climate Change

P. ferruginea is fully and jointly protected and is included in Appendix II of the Barcelona Convention, Annex 2 of the Bern Convention and Annex IV of the Habitats Directive.

Re-establishment of *Patella ferruginea* in Ligurian MPAs

The ReLife project aims to reintroduce *Patella ferruginea* into Ligurian MPAs taken specimen from Tavolara MPA (Sardinia) and through reproduction in controlled environmental.





ReLife

Re-establishment of *Patella ferruginea* in Ligurian MPAs

Collection (and transport)

The specimens of *P. ferruginea* are collected from Tavolara MPA (Sardinia), in a way that does not damage the specimens.

Researchers of the University of Genoa transported the specimens from Tavolara to the hatchery in Camogli (Portofino MPA).





ReLife

Re-establishment of *Patella ferruginea* in Ligurian MPAs

Reproduction

In the hatchery the researchers stimulate the emission of gametes in mature adults, in order to create a contact and start the process of fertilization





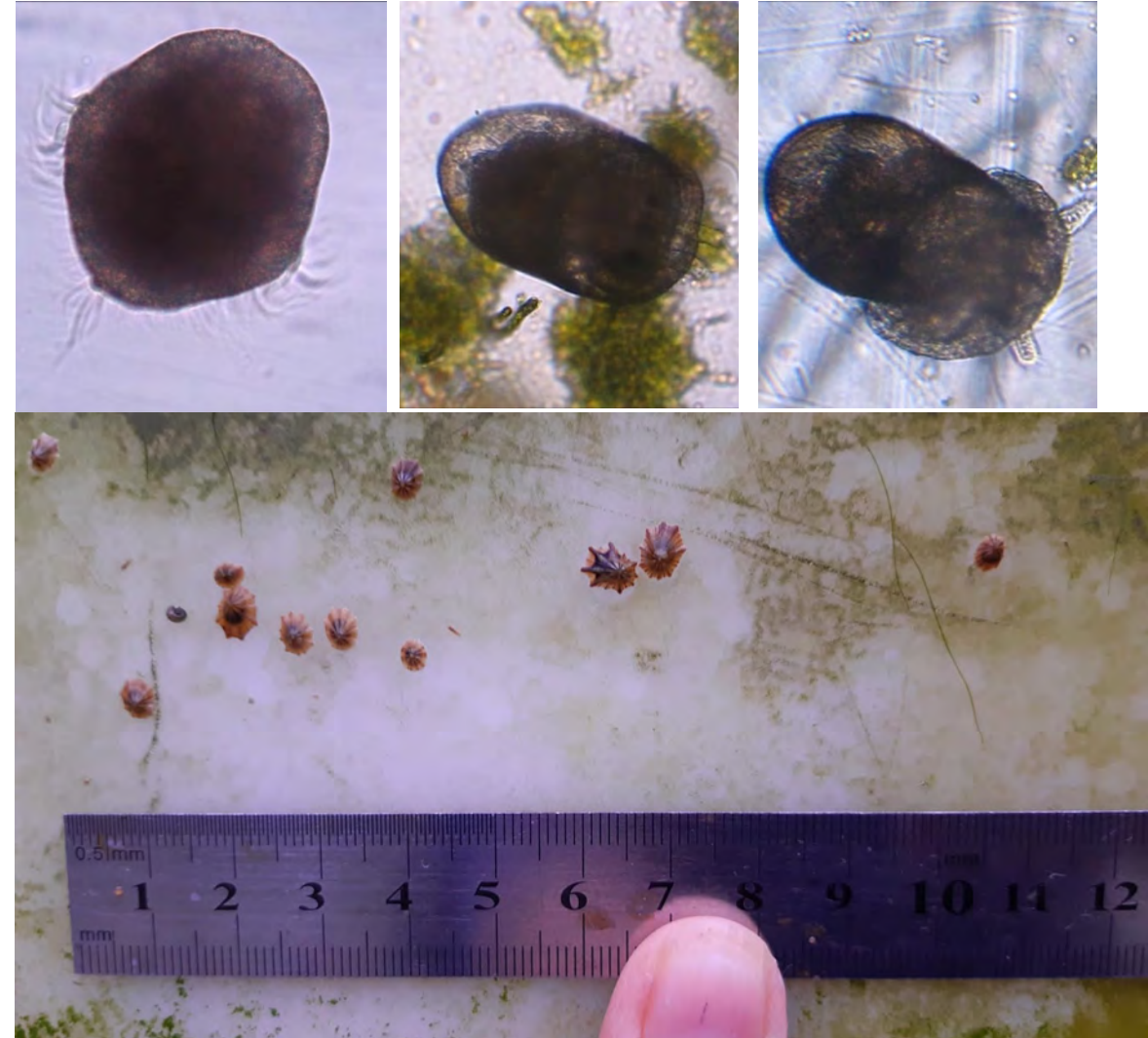
ReLife

Growth

Re-establishment of *Patella ferruginea* in Ligurian MPAs

Larval development and settlement, juveniles kept in ideal conditions to growth.

Juveniles are moved into tiles and placed in a natural environment.





ReLife

Re-establishment of *Patella ferruginea* in Ligurian MPAs

Re-introduction

The tiles are placed in the natural environment and initially wrapped in nets to prevent predation.

New individuals move to the natural substrate over time.



Conclusions

Ecosystem function restoration: Environmental Quality Indicators

Ecological Quality Index (CARLIT)

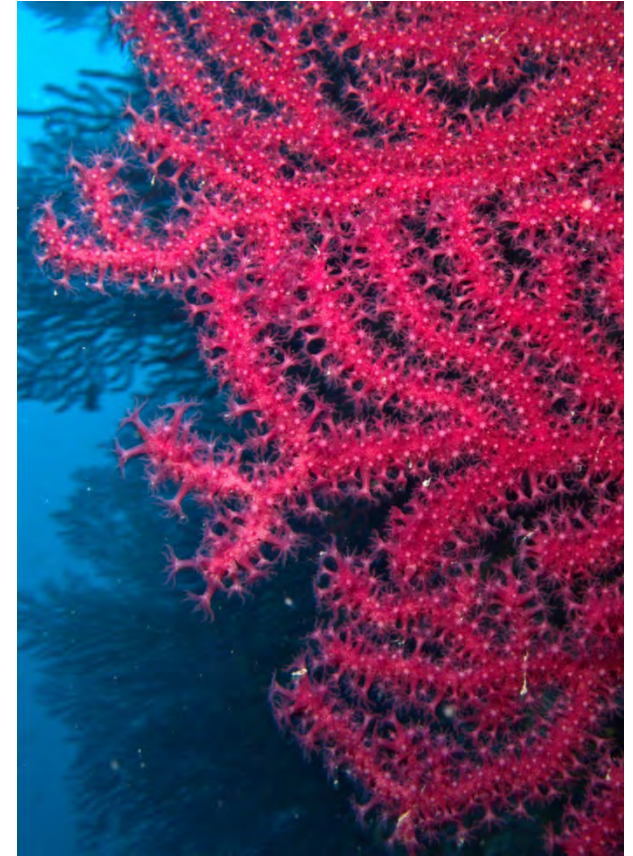
Before restoration action: **0.72 → GOOD**

After restoration actions (2021): **0.9 → HIGH**



Conclusions

Prevention is better than restore... but if it's too late, you have to restore.



Thank you!



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