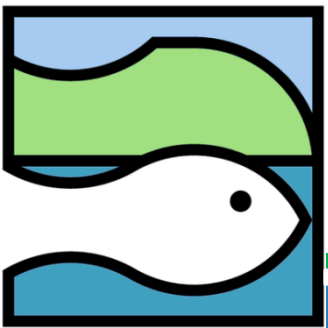


# Climate change adaptation in the Portofino Marine Protected Area: the collaboration with local stakeholders

## Case study



# Lorenzo Merotto — Portofino Marine Protected Area

Graduated in *Marine Environmental science* in 2014

Part of the *scientific technician staff of Portofino MPA since 2017*

Main field of work/study:

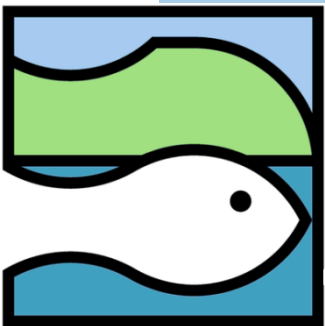
Climate Change, Fisheries, Monitoring of protected species (Posidonia oceanica, Pinna nobilis), Dissemination

Experience in EU Projects:

Interreg MED: MPA-adapt, MPA-engage, FishMPABlue2

Interreg Marittimo: NEPTUNE

Life: Roc-PopLife



**EUROPARC**  
FEDERATION



# 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

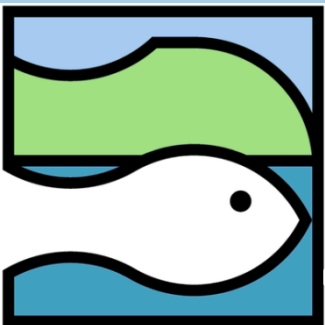
Date of Institution 1999

Surface: 346 he

Coast morphology: Cliff

Marine habitat:

Rocky bottom, coralligenous, Seagrass meadows



EUROPARC  
FEDERATION

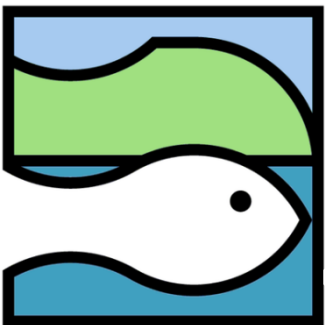


## Develop and application of standardized monitoring protocols addressed to use as climate change indicators:

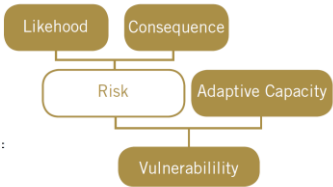
- Temperature monitoring at different depths
- Mortality assessment of benthos
- Visual Census of Fish Fauna
- Local Ecological Knowledge

## Develop of Vulnerability assessment (Biodiversity and socio-economic) and Adaptation Action Plans

## Involvement of Stakeholders through Citizen Science, Capacity Building and Dissemination Activities



# Vulnerability assessment of Biodiversity



## Vulnerability of 4 main habitats of Portofino MPA:

- Coralligenous :** HIGH
- Posidonia Meadows:** HIGH
- Rocky Bottom :** HIGH
- Pelagic:** MEDIUM

## Main stressors

### Non-Anthropogenic

- Temperature Anomaly
- Storms
- Sedimentation

### Anthropic

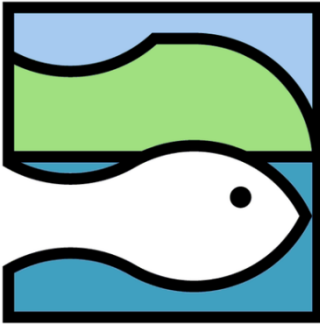
- Fishing gears
- Anchoring
- Pollution
- Alien Species



Ph .Lorenzo Merotto



Ph .Portfinodivers



Elaboration of an Adaptation Plan for each MPA, and a Joint Governance Plan

Protocols used: EcoAdapt



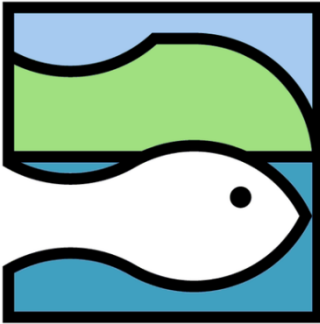
# Vulnerability assessment of Socio Economic aspects

MPA Extension: 346 Ha

*Main stakeholders of the MPA:*

	Units (mean value)	Valuation (€)	Vulnerability to CC
<b>Divers :</b>	40000	3M	MEDIUM
<b>Small scale fishermen:</b>	20	—	MEDIUM
<b>Recreational fishermen:</b>	250	—	-
<b>General Tourists:</b>	85000	2,4M	MEDIUM
<b>Recreational boaters:</b>	17000 boats	3,25M	N/A (Medium)

Elaboration of an Adaptation Plan, for each MPA and a Joint Governance Plan



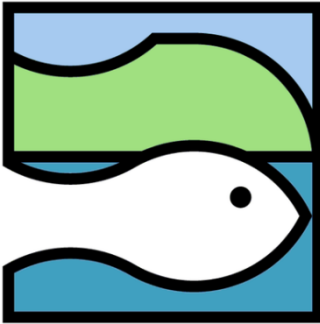
# Vulnerability assessment of Socio Economic aspects

**MPA Extension: 346 he**

*Main stakeholders of the MPA:*

	Units (mean value)	Valuation (€)	Vulnerability to CC
<b>Divers :</b>	40000	3M	MEDIUM
<b>Small scale fishermen:</b>	20	—	MEDIUM
<b>Recreational fishermen:</b>	250	—	-
<b>General Tourists:</b>	85000	2,4M	MEDIUM
<b>Recreational boaters:</b>	17000 boats	3,25M	N/A (Medium)

Elaboration of Adaptation Plan, for each MPA and a Joint Governance Plan

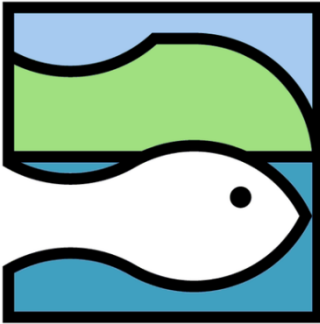


# Vulnerability assessment of Socio Economic aspects

MPA Extension: 346 he

*Main stakeholders of the MPA:*

	Units (mean value)	Valuation (€)	Vulnerability to CC
<b>Divers :</b>	40000	3M	MEDIUM
<b>Samll scale fishermen:</b>	20	—	MEDIUM
<b>Recreational fishermen:</b>	250	—	-
<b>General Tourists:</b>	85000	2,4M	MEDIUM
<b>Recreational boaters:</b>	17000 boats	3,25M	N/A (Medium)



Elaboration of Adaptation Plan, for each MPA and a Joint Governance Plan



# Vulnerability assessment of Socio Economic aspects: *Small scale Fishermen*

Number of Fishermen in 2018 : 20  
Age Average: 65  
Main fishing gears: Fixed net



Ph .Alessando Beltrame

## Stressors

Temperature (Stratification)

Storms

Thermophillic/Alien species

## Adaptive Capacity

Multispecific catch

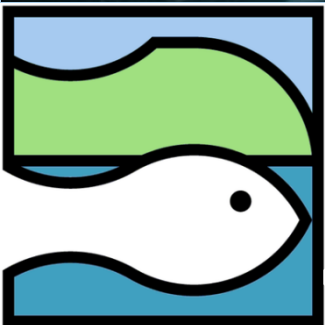
Different gears used  
(for season and target  
species )

Other income source

Vulnerability to CC:

**MEDIUM**

« *Small scale fisheries is threatened by social-economic factors not directly related to climate change, but this can get worse their condition* »



How we involve them ? Daily relationships, mutual support, educational activities, engagement in different projects, Capacity Buildings

How we collect data ? Logbook, interviews, field monitoring, relationships of trust



# Adaptation and engagement: *Small scale Fishermen*

Focus on increasing species, and avoid to catch decreasing ones

Educate consumers to know unusual species, in order to increase the sell price of them

## *Specie in diminuzione*

*Mormora* (*Lithognathus mormyrus*),

*Nasello* (*Merluccius merluccius*),

*Pagelli* (*Pagellus spp.*),

*Costardella* (*Scomberesox saurus*),

*Boga* (*Boops boops*),  
*Branzini grandi* (*Dicentrarchus labrax*),

*Orate grandi* (*Sparus aurata*)

## *Specie in aumento*

*Barracuda* (*Sphyraena viridensis*),

*Pesce Serra* (*Pomatomus saltatrix*),

*Cernia Bruna* (*Epinephelus marginatus*),

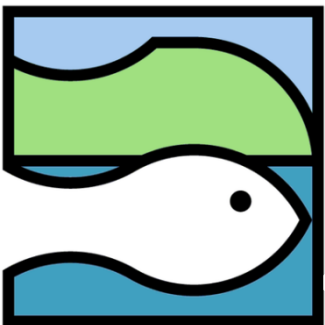
*Orate piccole* (*Sparus aurata*),

*Lampuga* (*Coryphaena hippurus*),

*Alletterato* (*Euthynnus alletteratus*),

*Cavalla* (*Scomber colias*)

*Ricciole* (*Seriola dumerilii*)

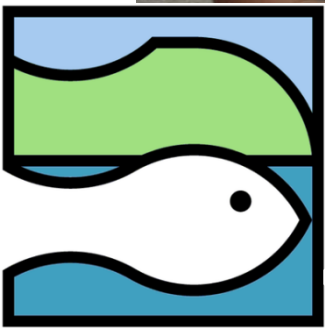


# Adaptation and engagement: *Small scale Fishermen*

Support in the monitoring and surveillance activities

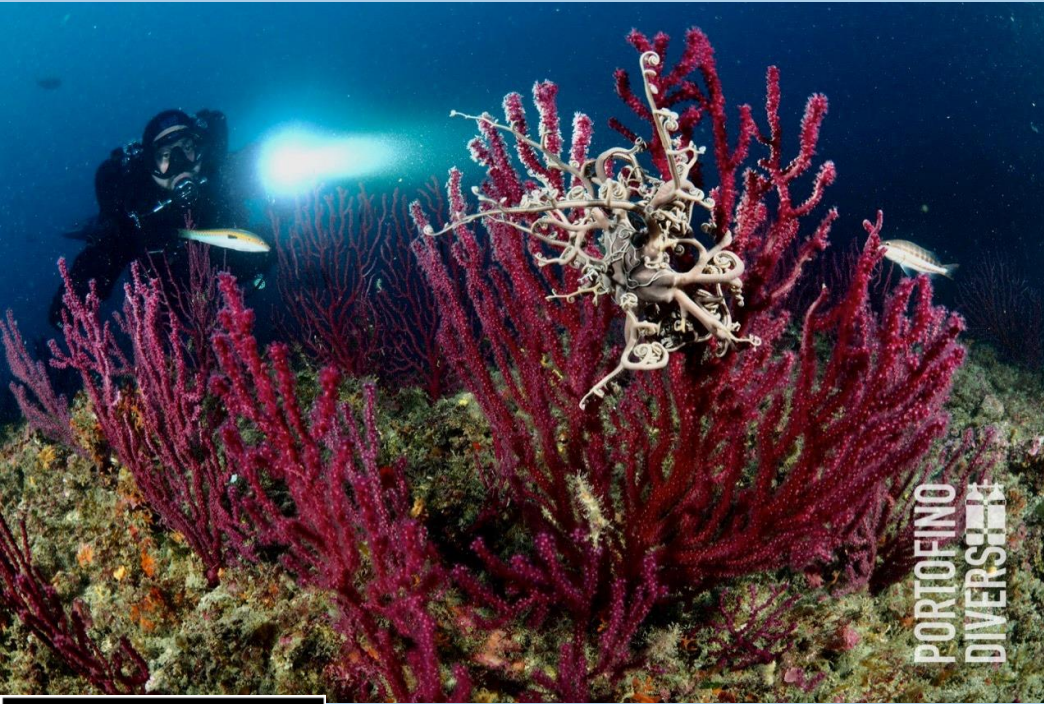


Education and dissemination addressed to general public; developing new source of income (fishtourism)



# Vulnerability assessment of Socio Economic aspects: *Diving activity*

Recreational Dive per year: 40000  
N° of diving center in 2018 : 15  
N° of diving sites: 21



## Climate change impacts

Temperature (Stratification)

Benthos Mass Mortality

Storms

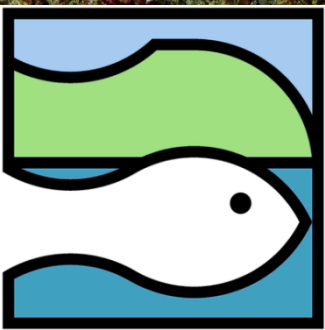
Flood/Turbidity

Thermophilic/Alien species

**Vulnerability:**

**MEDIUM**

*“Vulnerability depends on the type of use; e.g divers interested in benthos are more affected by climate change than the ones that prefer to observe big fish.”*



How we involve them ? Citizen Science, dissemination activities, engagement in different projects, Capacity Buildings

How we gather data ? Logbook, Interviews, good collaboration

# Adaptation and engagement:

## Involvement in monitoring and report of unusual events



Diving Evolution

24 agosto 2019 · 🌐

Purtroppo dopo il quasi totale annientamento delle nacchere (*Pinna nobilis*) dello scorso anno, un'altra patologia virale sembra colpire il mar ligure, questa volta a farne le spese sono le nostre cernie brune (*Epinephelus marginatus*) e le murene (*Muraena helena*). La causa di questa encefalopatia è ancora una volta la temperatura dell'acqua troppo alta. I pesci presentano occhi opacizzati, se non bianchi, pelle "vecchia" e talvolta rigonfiamento della vescica natatoria. Sono stati avvistati almeno due esemplari morti o moribondi, sul fondo e in superficie. Fate attenzione in immersione, ogni segnalazione ha un grande valore. Ringrazio Claudio Cavenaghi per la prima documentazione fotografica.



👍❤️👍 224

Commenti: 40 Condivisioni: 200

👍 Mi piace

💬 Commenta

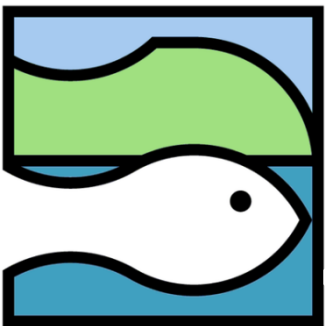
🔗 Condividi



# Divers

## Involvement in Educational activities and projects

Ph .Portfinodivers



# Adaptation and engagement:

# Divers

## Development of Citizen Science (also as new commercial opportunity)

**5 MINUTI**  
INSIEME SOTT'ACQUA  
PER IL CLIMA

MONITORARE GLI EFFETTI  
**MPA-ADAPT**

Un progetto per guidare  
le Aree Marine Protette del  
Mediterraneo attraverso  
l'era del cambiamento  
climatico  
#MPADAPT

Per info sul progetto: [mpa-adapt.interreg-med.eu](http://mpa-adapt.interreg-med.eu)



One Transect - a census of 5 transects (5x2 meters)

Site ID: \_\_\_\_\_ Date: \_\_\_\_\_

Client and depth: \_\_\_\_\_

Perform 5x2 transects  
Do not count individuals smaller than 2 cm

Observer: \_\_\_\_\_

Name: \_\_\_\_\_

RECREATIONAL DIVER level:  RESEARCHER

MPA Status:  OUT OF MPA  PARTIAL  FULL PROTECTION

Skills in species recognition:  NOT  GOOD  VERY GOOD

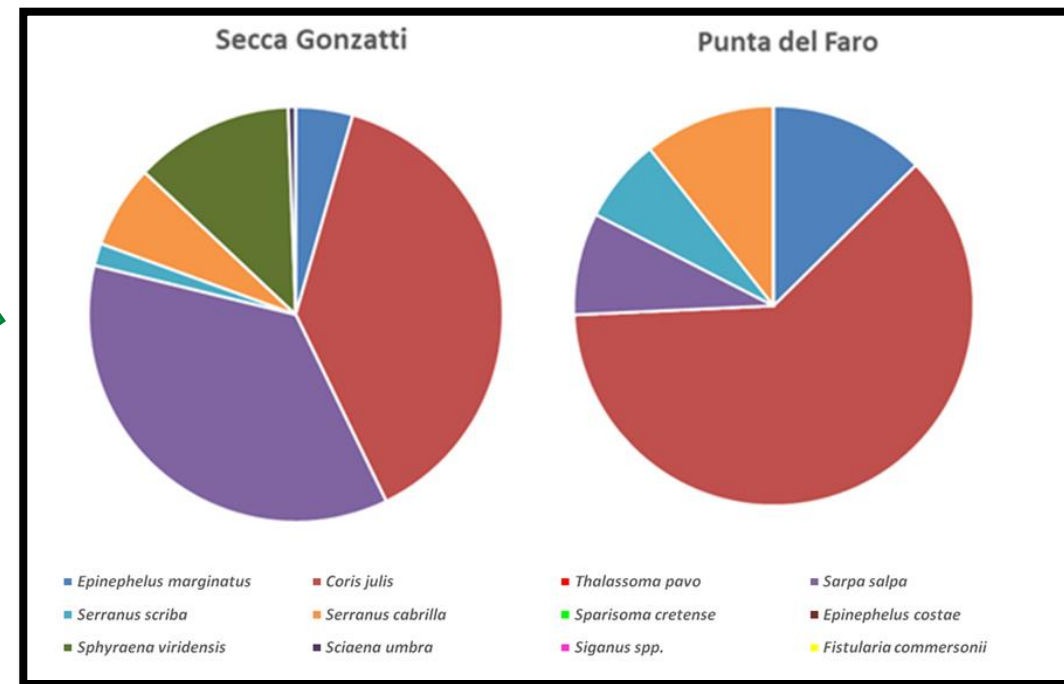
When & Where

MPA Name: \_\_\_\_\_

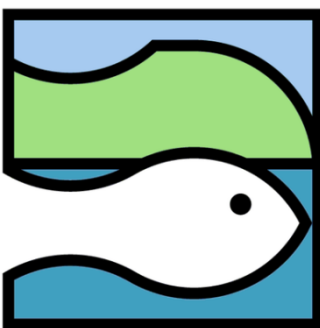
NAME OF PROMOTION LOCATION: \_\_\_\_\_

PROTECTION LEVEL: \_\_\_\_\_ DATE: \_\_\_\_\_ HOUR: \_\_\_\_\_

Species	1st transect					2nd transect				
	15m	15m	50m	50m	250m	15m	15m	50m	50m	250m
Epinephelus marginatus										
Coris julis										
Thalassoma pavo										
Sarpa salpa										
Serranus scriba										
Serranus cabrilla										
Sparisoma cretense										
Epinephelus costae										
Sphyaena viridensis										
Sciaena umbra										
Siganus spp.										
Fistularia commersonii										



Results of the pilot action (21 transects)

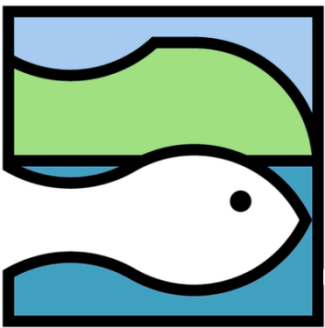


# Future goals:

1) Increase involvement of stakeholders and reach new ones (e.g recreational fishermen and boaters)



2) Involve Local administrators and policy makers

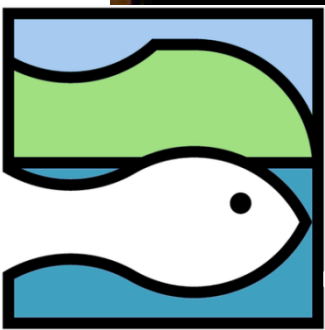


# How we think to Involve Local administrators and policy makers?

Support them in dissemination and educational activities



Organize capacity building





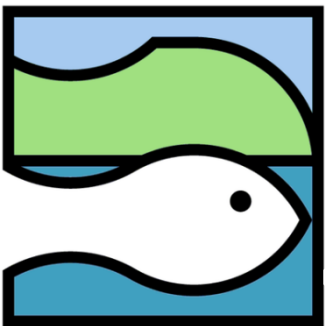
# How we think to Involve Local administrators and policy makers?

Use the results of the evaluation of the natural capital to make them aware regarding the importance of the habitats and their «monetary value»

Biocoenosis	Value per unit area - Benthos (€m <sup>2</sup> )	Value per unit area- Benthos+fish (€m <sup>2</sup> )	Surface (100000m <sup>2</sup> )	Total value (100000€)
Coralligenous	7.02	10.92	1.80	19.64
Sciaphilous circalittoral algae	1.11	4.11	0.03	0.11
P. oceanica dead matte	1	1.68	1.61	2.70
P. oceanica and dead matte	2.12	3.62	1.02	3.68
P. oceanica	2.99	6.35	3.64	23.08
P. oceanica on rocks	2.99	6.73	1.34	9.05
Photophilous algae	2.03	5.74	2.65	15.20
Sciaphilous infralittoral algae	1.01	5.03	1.62	8.18



UNIVERSITÀ DEGLI STUDI  
DI GENOVA



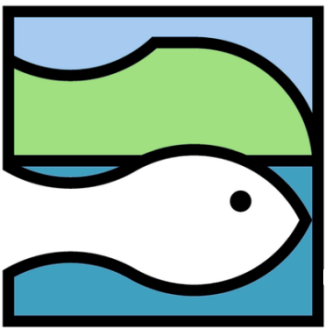
# Involve Local administrators and policy makers: Potential Issues and Obstacles

- For politician that aren't divers or fishermen is difficult what happen underwater
- The interest in environmental issues is mostly an appearance.
- Especially in small villages like the ones of the MPA, certain stakeholders can have a great influence on local administrators, as they represent a very important electoral basin.



## CONCLUSIONS:

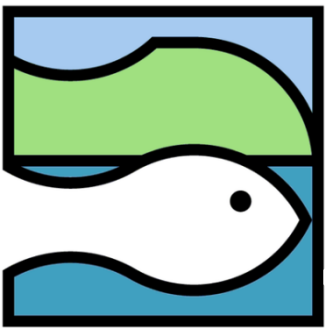
**If we want to get results, it is necessary to work simultaneously on the education of stakeholders and local administrators**



Involve Local administrators and policy makers:

## Winds are changing...

In recent years, local administrators' awareness and attention to environmental issues has been increasing, with more and more concrete actions and measures to reduce human impacts.



Our big goal:

To bring Local administrations and politicians to have the same vision as we do



# Thank you !

