Fishermen engagement: a key attribute to improve management of SSF in Mediterranean MPAs

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Fishing down marine food web + economic underperformance of fisheries
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Fishing down marine food web

- Economic underperformance of fisheries
- Society eager to sustainably consume seafood
Artisanal fishing (a.k.a. small scale fishing) is an historical activity deeply rooted in the Mediterranean Sea. It involves a considerable number of fishermen and vessels.

Fisheries potentially sustainable but in crisis (i.e. stock depletion)

Marine protected areas (MPAs) represent a valuable tool for both fishery management and marine conservation.

Artisanal fishing + MPAs = unique opportunity to develop new models of governance of fishing activities, more efficient and sustainable than the “traditional” ones.
MPAs facing stock depletion

**WELL MANAGED MARINE PROTECTED AREAS SUPPORT FISHERIES**

**IN EUROPEAN WATERS**
- +13% SIZE
- +19% DIVERSITY
- +121% DENSITY
- +251% BIOMASS

**EXAMPLE: TORRE GUACETO PROTECTED AREA, ITALY**
- 15x
  - The MPA not only exports adults and juveniles, but spawners also produce 15 times more eggs and larvae within the MPA than outside.
  - 100 km
  - Seas turtles move up to 100 km into fishing grounds.

**EXAMPLE: COLUMBETES ISLANDS PROTECTED AREA, SPAIN**
- 20x
  - The spawning potential of lobsters within the MPA has increased by up to 20 times compared to exploited areas.
  - 4 km
  - Individuals move up to 4 km into fishing grounds.

**ADULTS, LARVAE AND EGGS SPILL OVER INTO FISHING GROUNDS**
- Larger individuals inside MPAs produce significantly more eggs and larvae. Some larvae and eggs then drift to fished areas outside the MPA, up to hundreds of kilometers depending on the species.
- 2x
  - Catches double where the MPA is co-managed with fishermen.
- 10%
  - Lobsters from MPAs are larger, generating a 10% net income for fishermen.

**KEY PRINCIPLES FOR MPAs TO WORK:**
- Well designed
- Enforcement & compliance
- Part of an Integrated Management Plan
- Sustainably financed
- Local community engagement and staff capacity

WWF works globally to support Marine Protected Areas and ensure they contribute to securing food and livelihoods for people while conserving critical habitat and species. In some European MPAs, for example, collaboration with fishermen have allowed them to increase the quantity and quality of fishery yields and revenue.

[www.panda.org/mpa](http://www.panda.org/mpa)
There is a **substantial lack of information** about the circumstances under which small scale fisheries within MPAs can be successfully managed.
Aims of the study

• to provide an outline of the current situation of small scale fisheries in the Mediterranean MPAs
• to point out the potential factors influencing the success of small scale fisheries management in Mediterranean MPAs

34 MPAs from 7 Mediterranean countries
Successful management - rationale

We targeted as an ideal management practice as the one driving to:
• a) healthy fish assemblages within an MPA,
• b) benefits to fishermen (e.g. in terms of increased incomes)
• c) an overall acceptance of the management practice by fishermen.

- MPA ecological effectiveness
- Increase in CPUE
- Add-on social benefits

Overall Management Success (OMS) score: sum of 3 outcomes – ranging from 0 (no success) to 3 (max. success)
Attributes

Continuous variables (examples):

- Implementation year of the MPA
- Total area of the MPA
- Area of the no-take zone of the MPA
- Proportion no-take area/total area
- Number of vessels authorized to fish
- Ratio number of vessels/total area

Nominal and ordinal variables (i.e. yes/no; discrete levels):

- Recreational fishing allowed or not
- Presence/absence of a management plan
- Fishermen engagement level in management
Attributes

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Nominal and ordinal variables (i.e. yes/no; discrete levels):

- Recreational fishing allowed or not
- Presence/absence of a management plan
- **Fishermen engagement level in management**
Fishermen engagement - outline of the situation

As far as we can see, there is no real co-management.

Key features - overall success

Overall success

- Enforcement
- Fishermen engagement level
- Presence of fishermen in the MPA board
- Presence of an incentive promoting sustainable fishing
- Presence of a management plan
- HDI
- Ratio no-take/total area
- Only local fishermen allowed
- Number of artisanal boats
- Numerus clausus licence
- Ratio boats/total area
- MPA total area (km²)
- Fishermen financially compensated
- Fishermen predominantly organized in associations
- Licence needed
- Recreational fishing allowed
- Leader among fishermen
- MPA no-take zone area (km²)
- Implementation year
- Fishing tourism

Attribute relative importance

Key features - overall success

- Enforcement
- Fishermen engagement level
- Presence of fishermen in the board
- Presence of activity promoting sustainable fishing
- Management plan
- HDI

Overall success (Mean +/- SE)
Key features – overall success
Key features – for each outcome

Breakdown to the three outcomes

- Ecological effectiveness
- CPUE
- Add-on benefits

- Enforcement
- Fishermen engagement level
- Presence of fishermen in the MPA board
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Relative Importance

Decision: **Confirmed** ▶ **Tentative** ▶ **Rejected**
Key features - for each outcome

Breakdown to the three outcomes

- Ecological effectiveness
- CPUE
- Add-on benefits

- Enforcement
- Fishermen engagement level
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Relative Importance

Decision: Confirmed [Green], Tentative [Orange], Rejected [Red]
Fishermen engagement – an example


The total fishing ban triggered a conflict between fishers vs the management body and coast guard (fines imposed; boats, nets and licenses confiscated).

Fishermen felt to be the moral owners of that territory that have been stolen → the MPA was the ‘enemy’.
Fishermen engagement – an example

In 2005 a negotiation started and an agreement undersigned (the best possible compromise to be accepted by fishermen).

Adaptive management and fishermen engagement

- +428% increase in fish biomass within the no-take zone
- +126% increase in fishermen revenues when fishing in the buffer zone
- no infractions by local fishermen

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Fishermen contribute to protection of marine reserves

Joachim Claudet, Paolo Guidetti
Conclusion

The **key-features** identified require significant economic and social commitment to be implemented but they can allow managers and policy-makers to satisfy the growing public demand of responsible seafood consumption and support thriving of coastal communities.

To build a foundation of mutual trust is crucial.
Thank You