RECREATIONAL FISHING WITHIN MARINE PROTECTED AREAS IN THE MEDITERRANEAN

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INTRODUCTION

• This is the first study of its kind in Mediterranean waters which is intended to be of practical use in the management of Rec. Fish. in Mediterranean MPAs

• Recreational fishing is a booming activity in Mediterranean coastal areas, especially in MPAs

• Recreational fishing is of huge economic importance which, on occasion in certain locations, exceeds that of commercial fishing
• There is much less research into recreational fishing than there is into commercial fishing
• Our definition: *all non-commercial fishing that is carried out mainly for pleasure or sport, where the catch - the selling of which is illegal - is used for one's own consumption (or for one's family and friends)*
OBJECTIVES

• to define and characterize each of the different types of fishing in the MPAs
• to define and compare the biological impact on marine resources in the MPAs
• to summarize and compare the emerging and potential ecological impacts on the marine ecosystem in MPAs
• to establish and compare the social nature and the economic impact of recreational fishing in MPAs
• to establish recommendations for common basic methods for the control and monitoring the activity in the MPAs
• to compare current legislation with regard to recreational fishing in the various MPAs, non-legally binding agreements (such as codes of conduct) and educational programs
• to propose future management actions within MPAs to protect marine resources and ecosystems
METHODOLOGY

• We have not considered original, raw data to test a particular hypothesis. Instead, we have used existing studies and results.

• Sources:
  - questionnaires
  - scientific literature
  - grey (unpublished) literature
  - contact via email with managers
  - review of regulations
  - review of information leaflets and others
• About 30 questionnaires were answered by MPA managers from France, Italy, Spain, Croatia & Slovenia; 33 MPAs have been mentioned
• More than 140 documents have been reviewed in and outside the Mediterranean
• A great effort went into standardizing the data where possible
• We have compared the different types of fishing (boat, shore and underwater fishing)
MAIN RESULTS

Methods of sampling
• Diverse sampling methods can be used

• Aerial-access
• Aerial-roving
• Roving-access or access point
• Roving-roving or Roving creel survey
• Mail or telephone surveys
• Panel surveys
• Complemented surveys
**Fishing techniques**

- Boat fishing involves the highest number of fishing techniques used, and bottom fishing with a rod is by far the most commonly-used fishing technique used by both boat and shore fishermen.
Fishing effort

- Experience of fishermen seems to be an important factor to consider (affects catchability and selectivity)
Fishing yields

- CPUE can vary considerably depending on:
  - the year and season
  - the location (reserve, depth and type of habitat)
  - the fishing gear used
  - the fisherman’s experience
  - the weather
  - the characteristics of the gear or the type of bait

- Boat fishing has the largest extractive potential (followed by spearfishing and shore fishing)
Direct impacts on coastal marine resources

The catch

- The highest number of different species were found in Côte Bleue (78) and the lowest in Cap d’Agde (23)
- *S. cabrilla* and *C. julis* are the species under most severe fishing pressure from both boat and shore fishermen

![Graph showing most caught species (boat)]
• The most common species caught by spearfishers are from the genus *Diplodus*, *Dicentrarchus labrax* and *Octopus Vulgaris*

• Boat fishing, in general, is responsible for catching more species than the other types of fishing
Fish vulnerability

- In total, 41 vulnerable species have been found to have been caught by recreational fishermen.
- The average proportion of vulnerable species in the catch in all MPAs is about 30%; min. in Côte Bleue with 10% and max. in Cap de Creus, Medes and Porquerolles with more than 40%.
- Boat fishing would therefore seem, a priori, to have the greatest impact on vulnerable species.
Indirect impacts on coastal marine resources

- *Catch & release* does not seem to be a common practice in the Mediterranean, although it is often a difficult but necessary concept to quantify.
**Baits**

- A total of 11 groups of baits were found being used in the Mediterranean, with a great diversity within each group:
  - worms (*Polychaeta*)
  - sipunculids
  - fish species (dead or alive)
  - cephalopod molluscs
  - crustaceans
  - bivalve molluscs
  - gastropod molluscs
  - artificial lures
  - Other: bread, algae, crayfish, silkworms, chicken feet, etc.
• Potential effects of exotic baits (e.g. at least 43% of bait used in Cap de Creus was not native to the Mediterranean)

Korean ragworm (*Perinereis aibuhitensis*), American worm (*Glycera dibranchiata*), Peanut worm (*Sipunculus nudus*)
Lost & abandoned fishing gear

- It is common for recreational fishermen to lose, or throw away, all kinds of fishing gear, such as lead weights, lines and hooks, plastics, etc. which can cause significant impacts on the marine ecosystem.
Anchoring
Mechanical damage caused to the seabed can also become a significant problem
Social profile

- In general, recreational fishermen are:
  - Men (always >80%)
  - average age of around 47
  - mostly pensioners, merchants and company employees
  - significant degree of fishing experience (usually >10 years)
• Low level of knowledge and awareness regarding the impact of their activity on the natural environment
• Conflicts between different users of MPAs are common
Economic aspects

- The type of fishing they carry out does directly affect their level of expenditure and boat fishing appears to generate the greatest economic impact

Average Cost per fisherman

- €500 to €1600 for boat fishers
- €200 to €900 for shore fishers
- €400 to €900 for spearfishers

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**Boat fishermen’s spending on fishing gear and boat fuel**

(*plus maintenance; **gear only*)

![Bar chart showing spending on fishing gear and boat fuel for different locations and years.](chart.png)
• Almost none of these studies consider the initial investment in the values
Regulations

- *European:* to date no specific regulations regarding recreational fishing have been established
- *National:* Regulatory efforts are focused above all on:
  - restricting the use of particular fishing gears
  - reducing the fishing effort
  - limiting the volume of catches
  - limiting minimum sizes and weights
• **MPA:**
  - More than 70% of MPAs have at least one no-take zone, but the extension of these areas is rather small (normally <10%)
  - About half of MPAs require some sort of fishing license, but less than 30% require a fee
  - As with national legislation, the type of restrictions most used by managers concern fishing techniques and fishing effort
MAIN RECOMMENDATIONS

(Established on the deficiencies identified in the studies)

Monitoring the RF

A series of recommendations that will serve as the first step to draw up a specific methodological guide for monitoring RF in the Mediterranean MPAs.
Management

- Enhance the involvement of fishermen in management (co-management)
- The need to establish an obligatory licensing system for those fishermen who want to fish within its boundaries
- It would also be of great use if the MedPAN network provided a licensing system that was common to all its associated MPAs
- The generally small size of the no-take zones of each MPA (<10%), highlights the need to expand these areas where fishing is prohibited
• To adjust minimum landing sizes so that they are larger than size at maturity, especially in the most vulnerable species
• The protection of vulnerable species needs special attention
• To extend the practice of obligatory clipping of the caudal fin of some species (as occurs in France) to other countries
Environmental education

• Elaboration management tools based on propagating environmental values and other information fishermen find useful, such as regulations

• **Specific website on recreational fishing in the Mediterranean MPAs**

• Draw up Codes of Conduct focused on recreational fishing
CONCLUSION

MPAs provide resources for fisheries, in particular recreational fishing, facilitating the enjoyment of these areas and the development of local economies.

For a sustainable use of the sea, further research and proactive management and regulation regarding recreational fishing should be urgently undertaken in Mediterranean MPAs.
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This work is dedicated to the memory of our friend and colleague, Alex Lorente.
Thanks for your attention!!
Learn more on the MedPAN North stand!
Happy Hour at 6pm