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**Uses of ecosystem services provided by MPAs:  
how much do they impact the local economy?  
A Southern Europe perspective**



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Assessing the economic value of MPAs

Assessing their local economic impact

} 2 different topics



A major concern for public policy makers, since it governs social acceptability of MPAs.

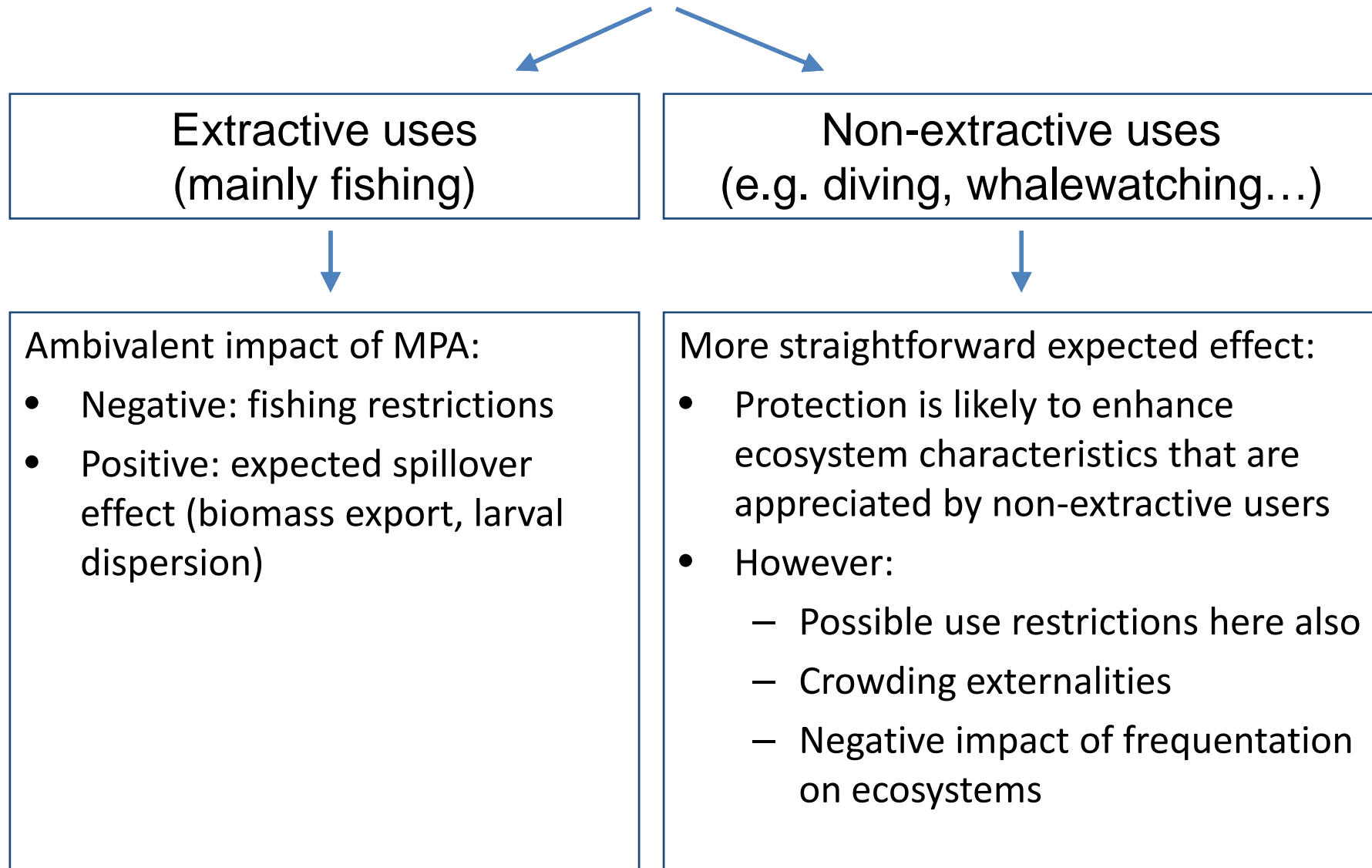
Explanation: social benefits and social costs of protection have different geographic (and time) scales :

- expected **benefits** are mainly **large-scale** and **long-time**
- associated **constraints** are mainly **local** and apply **immediately**.



Political necessity to compensate local populations by exhibiting tangible benefits at their own scale.

# Two types of ecosystem services uses likely to be impacted by MPA



# Purpose of the study

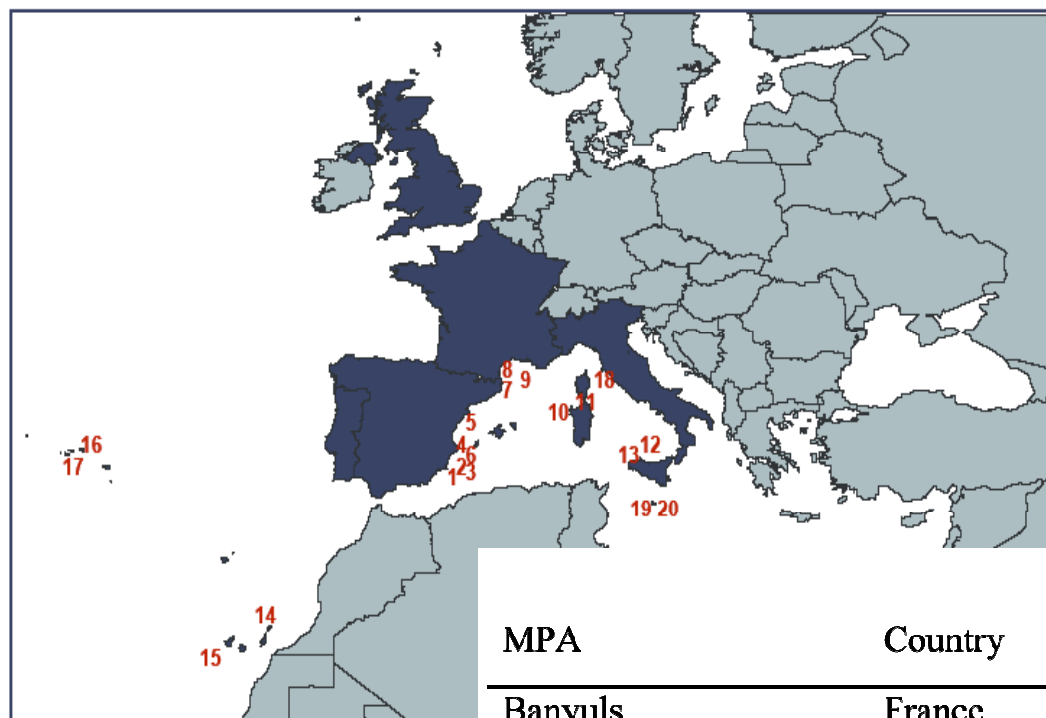
- To assess the local economic impact of MPAs in Southern Europe
- Assessment based on a standardised methodology...
- ... and a broad socio-economic survey covering 12 case studies.
- Focus on 2 major uses of marine ecosystem services:
  - fishing (commercial and recreational)
  - scuba-diving

# Framework

- EU funded “EMPAFISH” project (FP6, 2004-2008)
- A multidisciplinary research project dedicated to the assessment of the impacts of MPAs on marine environment conservation and fishing.
- Geographical scope: Southern Europe (20 MPAs located in 5 countries)

# Organisation of the presentation

- Case studies and field survey
- Assessment methodology
- Results
- Discussion



## The 20 EMPAFISH case studies...

... among  
which the 12  
case studies  
covered by  
socioeconomic  
survey

MPA	Country	Location	Area (ha)	
			Total	Integral reserve or NTZ
Banyuls	France	Mediterranean	715	65
Bonifacio	France	Mediterranean	80,000	1,200
Cabo de Palos	Spain	Mediterranean	1,898	270
Columbretes Islands	Spain	Mediterranean	4,400	1,893
Côte Bleue	France	Mediterranean	9,873	295
La Graciosa	Spain	Atlantic <sup>a</sup>	70,700	1,225
La Restinga	Spain	Atlantic <sup>a</sup>	750	180
Medes Islands	Spain	Mediterranean	511	93
Monte da Guia	Portugal	Atlantic <sup>b</sup>	443	10
Sinis	Italy	Mediterranean	25,673	529
Tabarca	Spain	Mediterranean	1,400	100
Tuscany Archipelago	Italy	Mediterranean	56,766	6,147
Mean			21,094	1,001
Standard Deviation			30,248	1,727

<sup>a</sup> Canary Islands. <sup>b</sup> Azore Islands. Source: MPA managers.

MPA	Commercial fishing boats		Recreational fishers	Scuba divers	Visitors
	Yearly number	Average length*	Yearly number	Yearly number	Yearly number
Banyuls	8	<i>n.a.</i>	1,460	13,000	100,000
Bonifacio	30	<i>n.a.</i>	150	10,000	150,000
Cabo de Palos	7	8.8	<i>n.a.</i>	9,000	17,400
Columbretes Islands	60	19.7	<i>n.a.</i>	3,500	3,000
Côte Bleue	40	<i>n.a.</i>	6,870	16,000	<i>n.a.</i>
La Graciosa	30	10.6	1,250	<i>n.a.</i>	75,000
La Restinga	33	7.9	1,500	2,700	<i>n.a.</i>
Medes Islands	21	6.6	<i>n.a.</i>	18,000	268,000
Monte da Guia	80	8.4	340	1,300	4,000
Sinis	124	8.6	<i>n.a.</i>	350	2,500
Tabarca	<i>n.a.</i>	<i>n.a.</i>	2,350	1,000	80,000
Tuscany Archipelago	121	7.0	<i>n.a.</i>	3,500	310,000
Mean	50	10.7	1,989	7,123	100,990
Standard deviation	41	4.4	2,277	6,376	110,952

\* Unit: metre. Source: Empafish field survey 2005-2006 for boats average length. MPA managers for all other data.

## Estimated populations of MPA ecosystem users

## Socio-economic field survey: number of answers concerning fishing and scuba diving

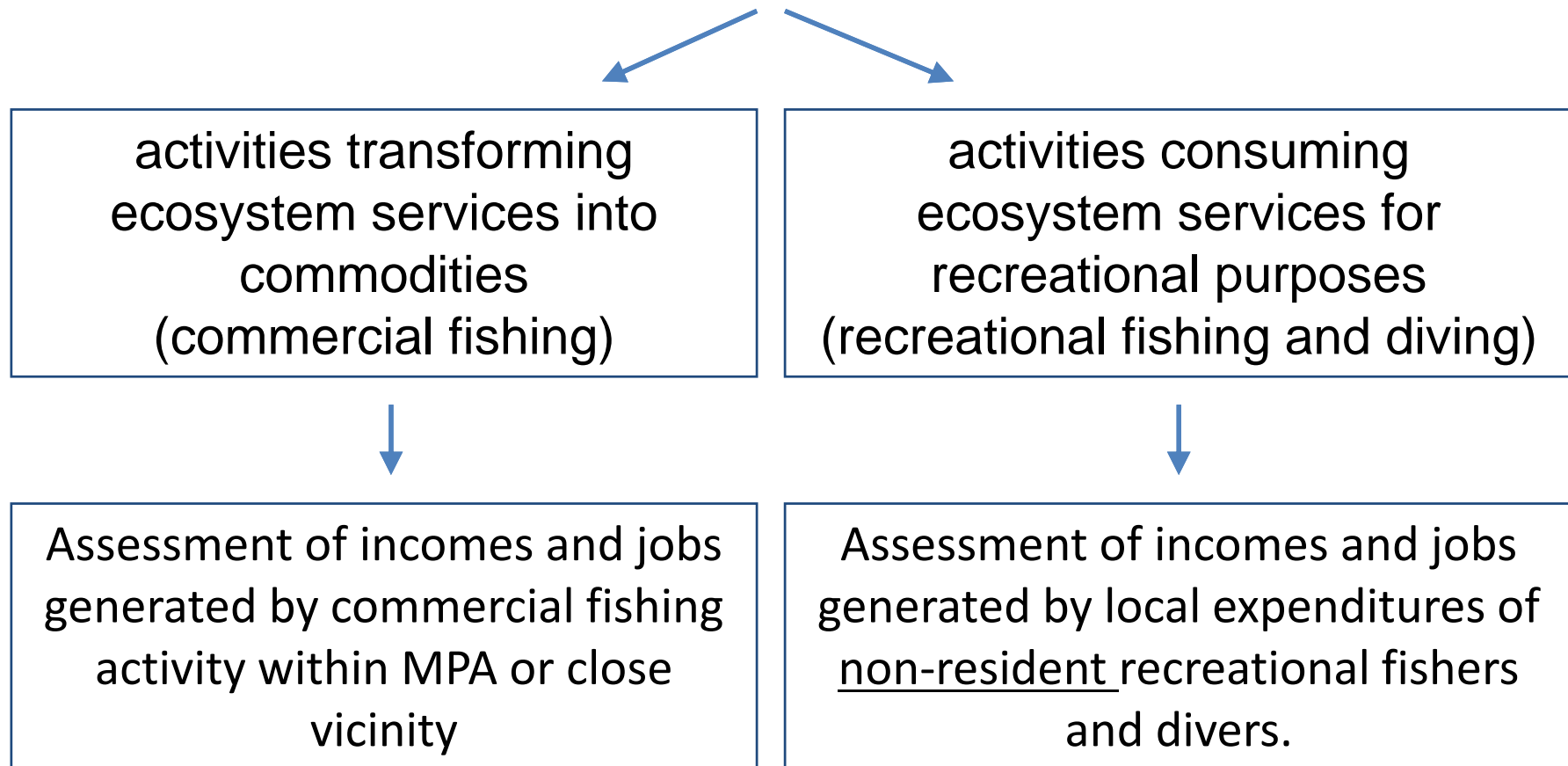
MPA	Types of uses		Scuba diving	
	Professional	Recreational	Operators	Divers
Banyuls			11	82
Bonifacio		10	6	108
Cabo de Palos	4		4	132
Columbretes Islands	20		8	257
Côte Bleue		262	17	689
La Graciosa	14	184		
La Restinga	28	142		159
Medes Islands	16		6	147
Monte da Guia	51	76	3	57
Sinis	36	25	3	34
Tabarca			1	108
Tuscany Archipelago	1		1	63
<b>Total</b>	<b>170</b>	<b>699</b>	<b>60</b>	<b>1,836</b>

Source: Empafish field survey 2005-2006.



# Economic impact assessment methodology

- “Local economic impact” = incomes and jobs generated in the neighbouring coastal area by activities using MPA ecosystem services.
- Only direct money incomes and jobs were considered.
- Distinction between 2 kinds of activities :



# Methodology (cont.)

- **Commercial fishing:**

- All commercial fishers with an activity inside MPA (or close vicinity) were considered resident.
- Boat crew, annual turnover and share of catches coming from MPA (or close vicinity) were provided by field survey.
- Added value was estimated with the help of ratios calculated for the French Mediterranean commercial fishing fleet (Ifremer, SIH).

- **Recreational activities:**

- Recreational users with permanent home > 50 km from MPA were considered non-resident.
- Only non-resident users whose stay was mainly motivated by fishing or diving in the area were retained.
- Estimation of their local expenditure was provided by field survey.
- Corresponding local added value and jobs were estimated with the help of ratios derived from statistical data concerning the French seaside tourism industry (Ifremer, French Maritime Economic data).

**Results:  
estimated  
yearly money  
incomes and  
jobs generated  
by MPA  
ecosystem  
services uses**

MPA	Professional fishing <sup>a</sup>		Recreational fishing <sup>b</sup>		Scuba diving <sup>b</sup>	
	Added value <sup>c</sup>	Jobs <sup>d</sup>	Added value <sup>c</sup>	Jobs <sup>d</sup>	Added value <sup>c</sup>	Jobs <sup>d</sup>
Banyuls					973	22.9
Bonifacio					948	22.3
Cabo de Palos					868	20.4
Columbretes	1,573	50.4			211	5.0
Côte Bleue			52	1.8	632	14.9
La Graciosa	482	50.0	35	1.1		
La Restinga	306	31.4	55	1.7	616	14.5
Medes	48	4.2			1,099	25.9
Monte da Guia			211	5.0	241	5.7
Sinis	1,140	133.9			16	0.4
Tabarca					16	0.4
Tuscany					446	10.5
Mean	710	54.0	88	2.1	551	13.0
Standard Dev.	563	43.4	71	1.7	374	8.8

<sup>a</sup> Added value and jobs due to fishing within MPA. <sup>b</sup> Added value and jobs related to expenditures of non-resident recreational users of MPA. <sup>c</sup> Unit: 1000 €. <sup>d</sup> Yearly full time equivalents. Data source: Empafish field survey..

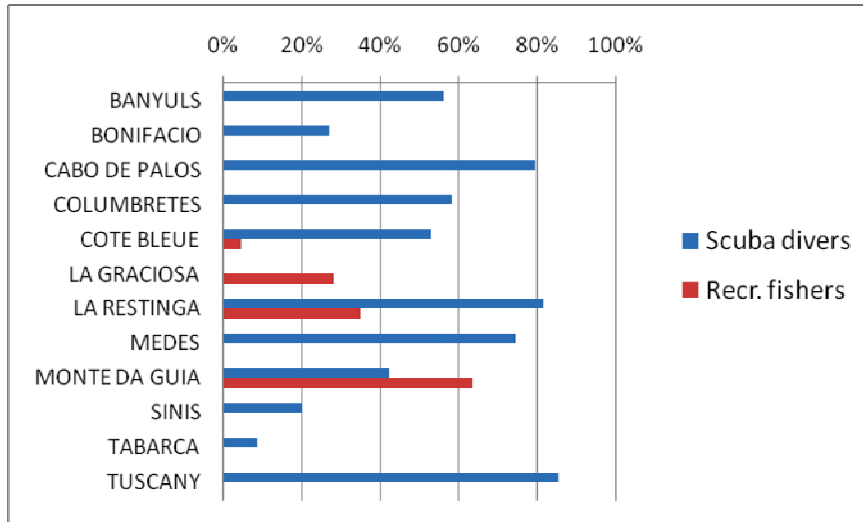
## Benchmarking: MPA yearly management costs

MPA	Labour costs	Other costs	Total costs
Banyuls	162	353	515
Bonifacio	1,100	1 300	2 400
Cabo de Palos	231	15	246
Columbretes Islands	455	286	742
Côte Bleue	179	109	287
La Graciosa	314	68	382
La Restinga	368	57	424
Medes Islands	156	240	397
Monte da Guia	96	214	310
Sinis	239	50	289
Tabarca	365	110	475
Tuscany Archipelago	<i>n.a.</i>	<i>n.a.</i>	<i>n.a.</i>
Mean	333	255	588
Standard Deviation	277	363	617

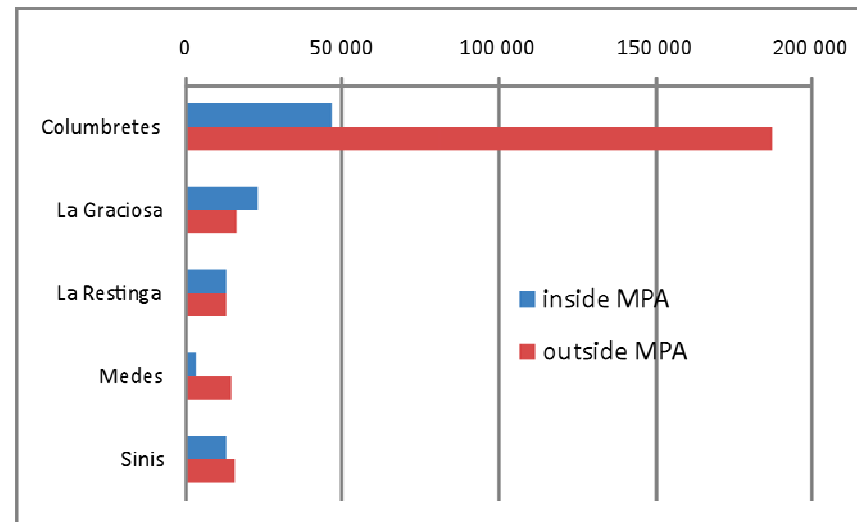
\* Running costs, including scientific monitoring and enforcement. Unit: 1000 €. Data source: MPA authorities.

# Highlighting the diversity of situations

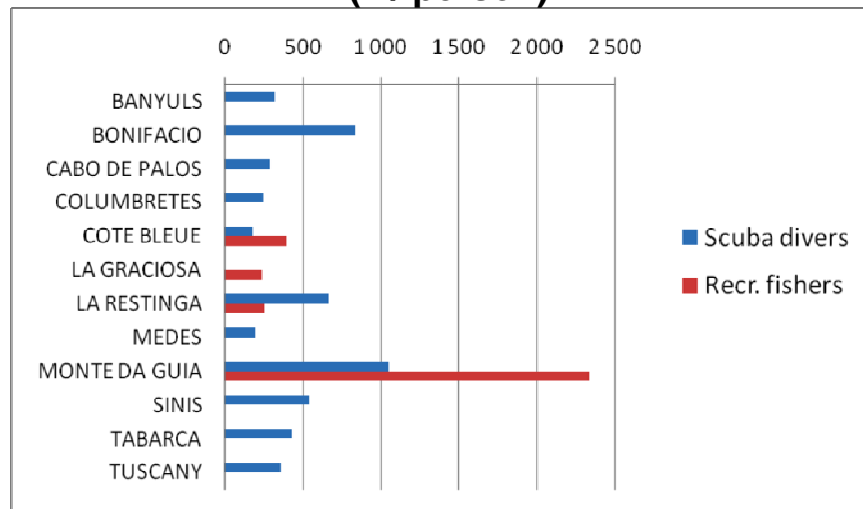
**Recreational uses: % of users whose stay was mainly motivated by fishing or diving in the area**



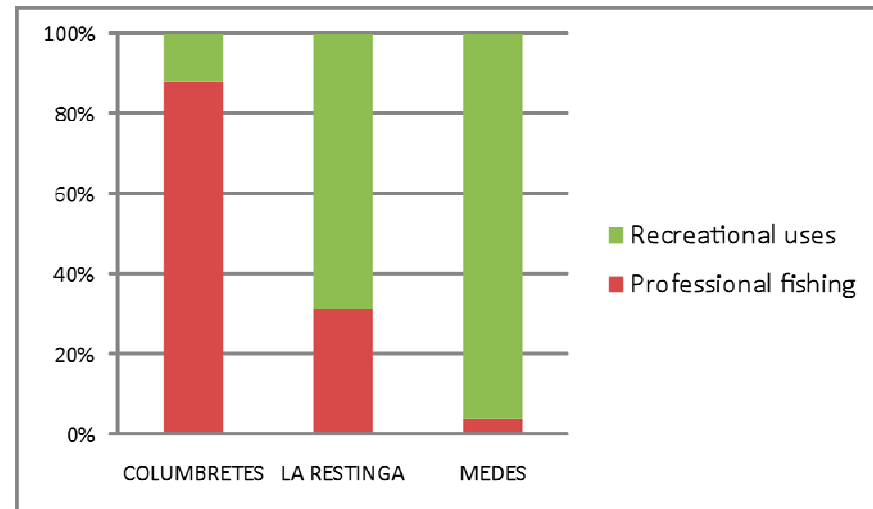
**Commercial fishing: landings value, according to origin of catches (€/ boat)**



**Average local expenditure of these users (€/ person)**



**Structure of money incomes locally generated by MPA-related activities**



# Discussion: sorting out the “reserve effect” from the “site effect”

- **Problem:**

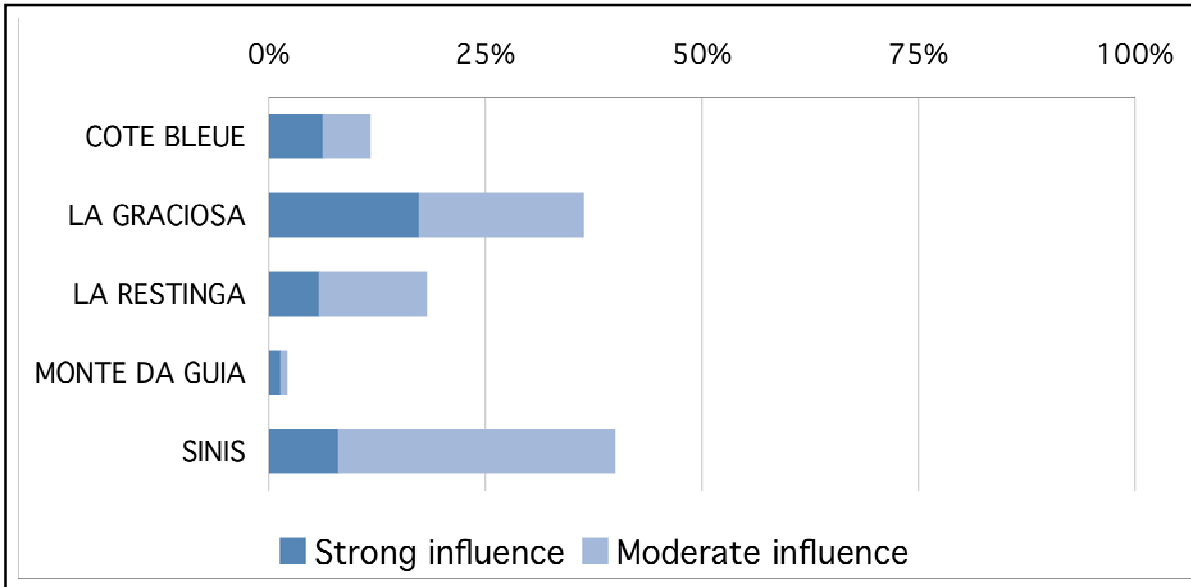
- the estimated economic impact of MPA-related activities cannot be unambiguously attributed to protection
- If ecosystem was not protected, how many people would still use its services ?

- **Possible solutions:**

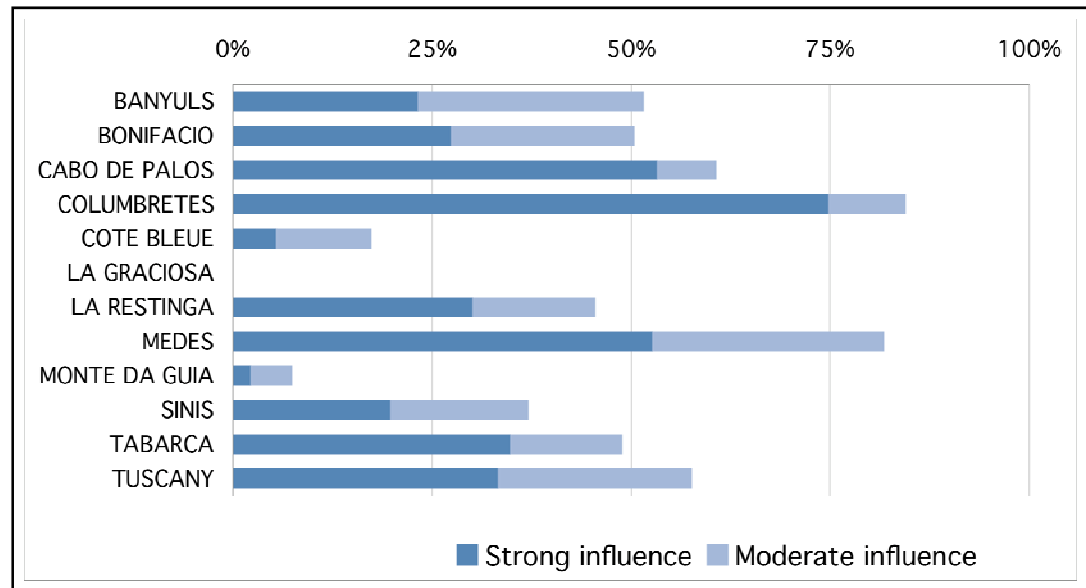
- Direct estimation based on observed behaviours
  - Difficulty: no baseline
- Contingent approach (e.g. Carlson 2004)
  - Difficulty: respondents do not necessarily have a clear vision of the implication of protection

→ Use of a qualitative approach based on survey answers concerning perceptions and opinions of users

# Declarations of recreational users concerning the influence of the MPA on the site choice

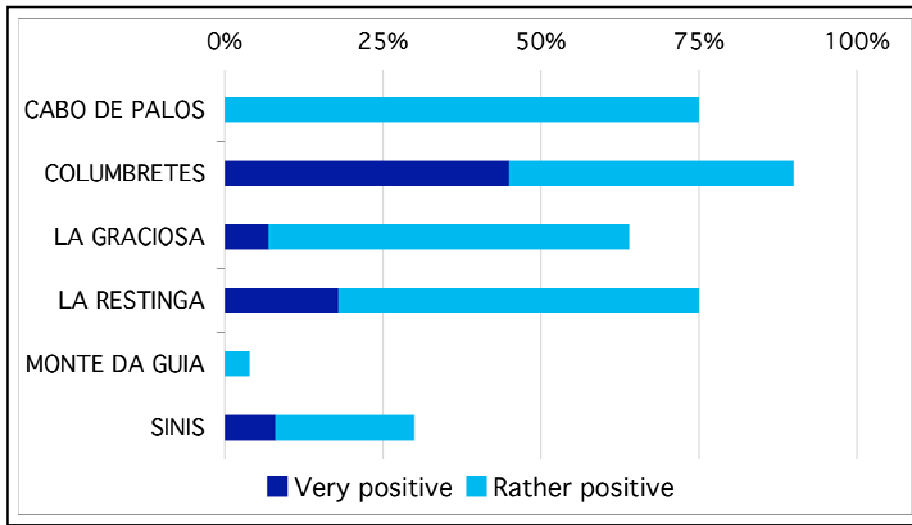


## Recreational fishers

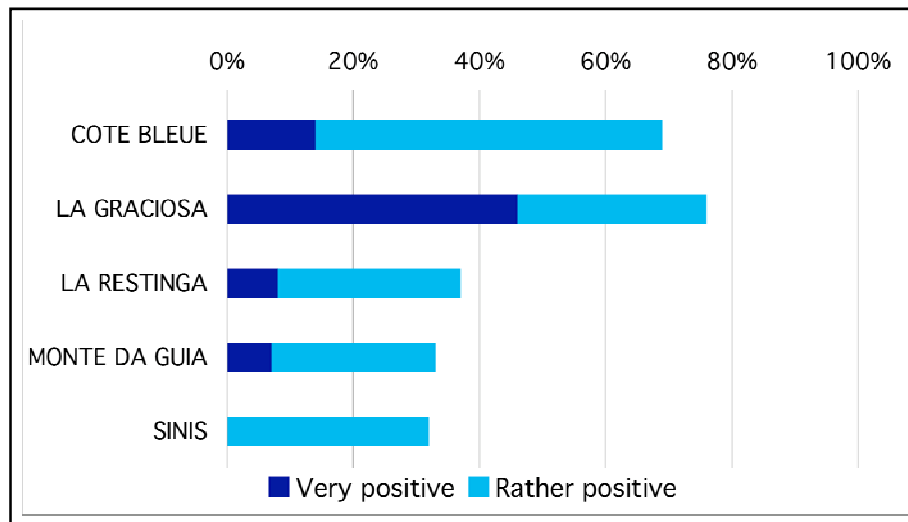


## Scuba divers

# Opinions of users and operators concerning the impact of the MPA on their own activity

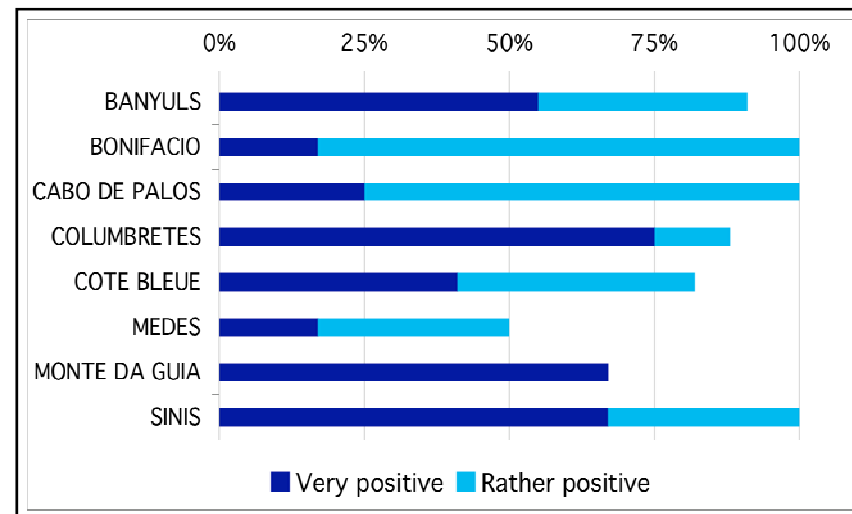


Commercial fishers

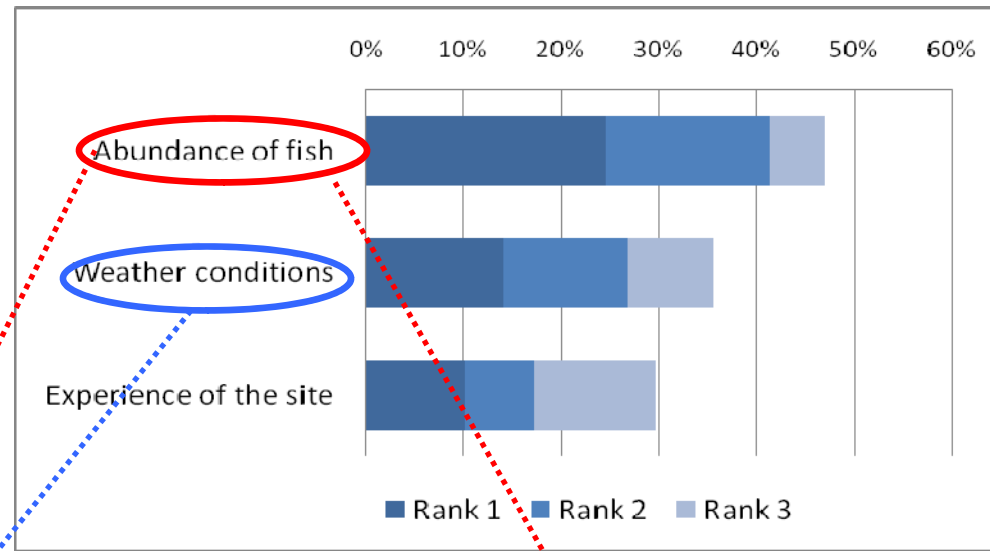


Recreational fishers

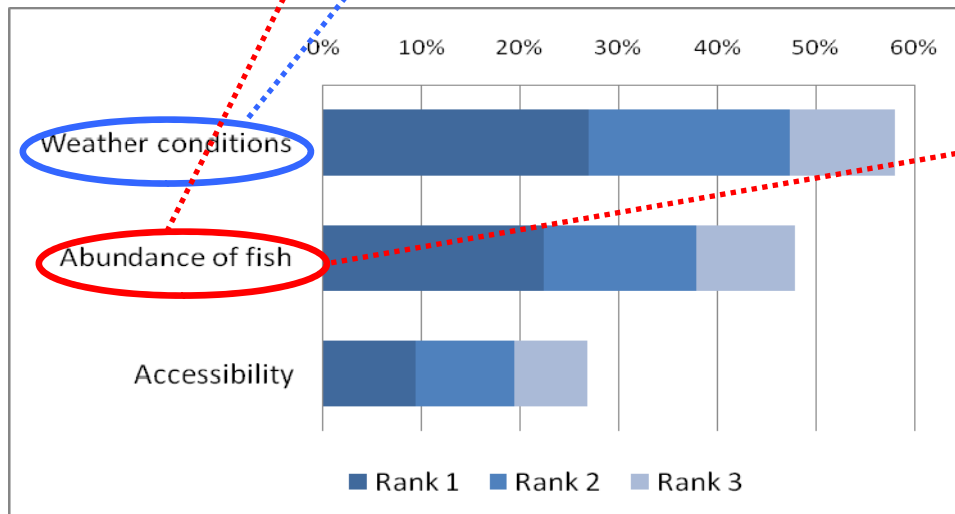
Diving operators



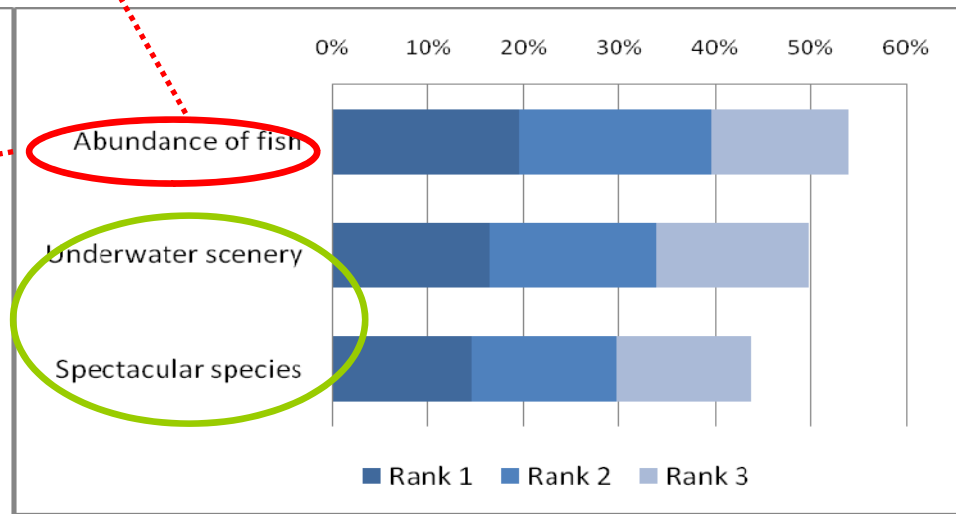
# 3 major criteria for selecting a site :



## Recreational fishers



## Scuba divers





## Concluding remarks

- A conservative approach to the assessment of the local economic impact of MPA-related activities
- Incomes generated by these activities are significantly higher than MPA management costs
  - An opportunity for cost-recovery?
- A reserve effect difficult to ascertain precisely, but more conspicuous in the case of diving than fishing
  - Consistent with biological evidence (and lack of evidence as well !)
- To be improved:
  - Knowledge of MPA frequentation
  - Zoning

This research was developed within the framework of the project EMPAFISH (SSP8-006539) supported by the EU within the FP6.

[www.um.es/empafish](http://www.um.es/empafish)



Its methodology and main results were presented at the 14<sup>th</sup> biennial IIFET Conference, July 22-25, 2008, Nha Trang, Vietnam...



International Institute of Fisheries Economics and Trade



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*Thank you for your attention !*