Comparison of different management scenarios of demersal fisheries in the Adriatic Sea including space and time closures

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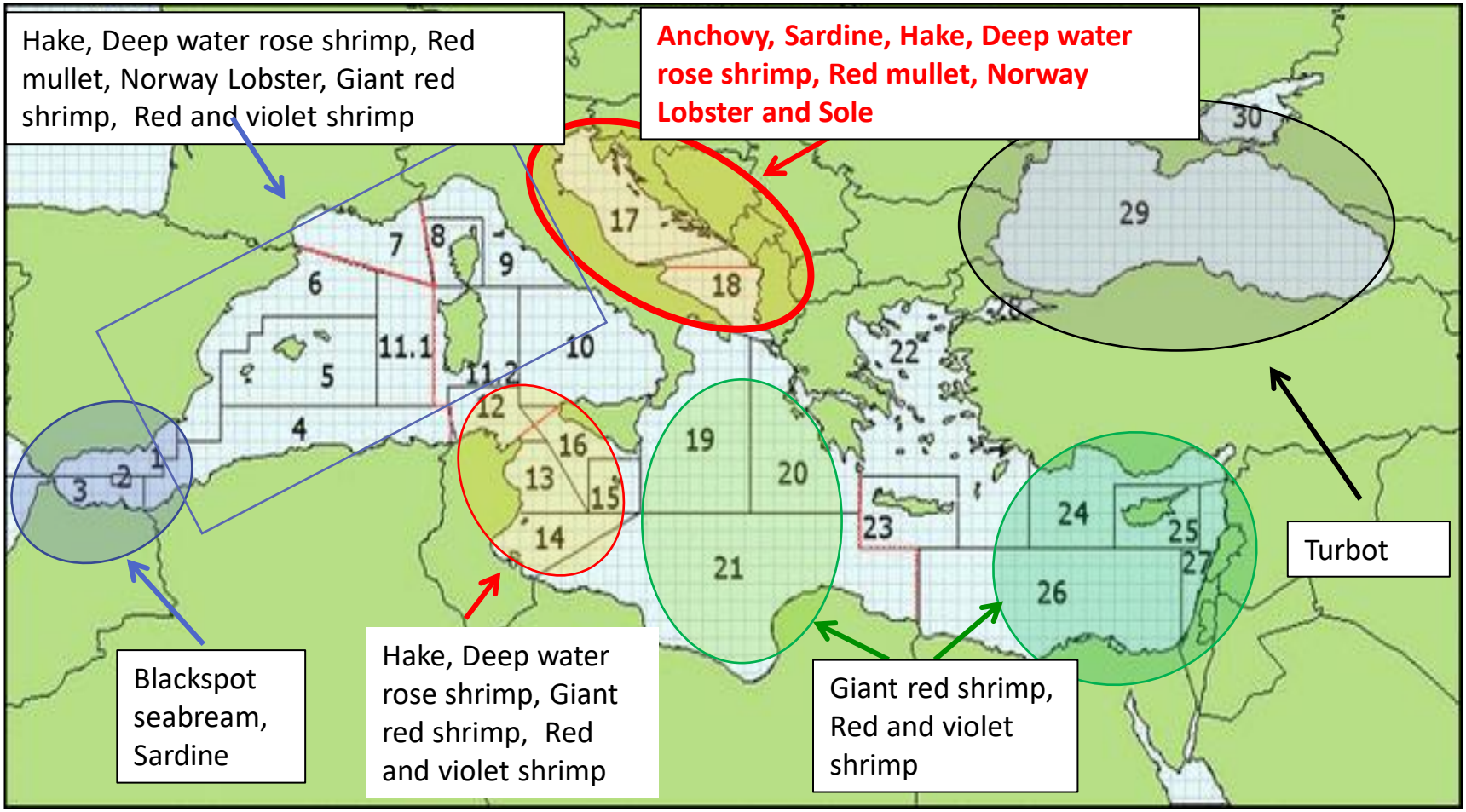
GSAs and species under international Fisheries Management Plans in the GFCM area



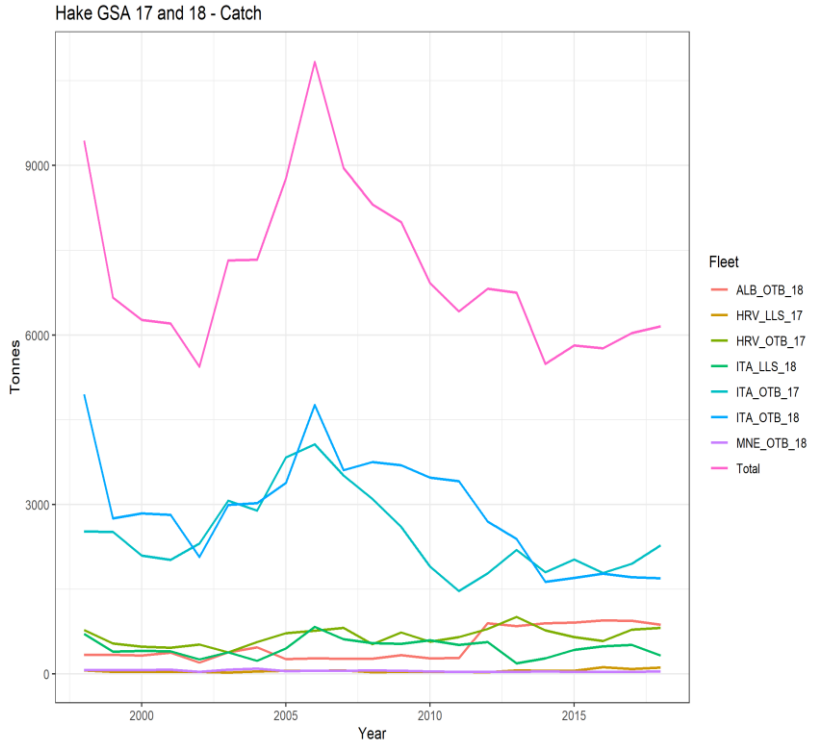
The main features of the demersal fisheries in the Adriatic Sea

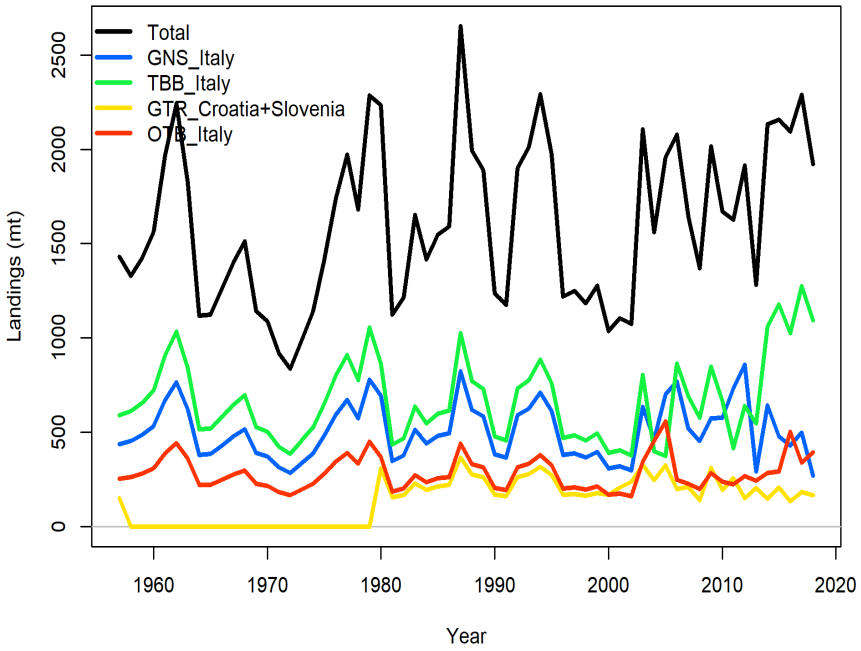
The demersal stocks in the Adriatic Sea are shared between Italy, Croatia, Albania, Slovenia and Montenegro

The main target species of demersal fisheries in the Adriatic

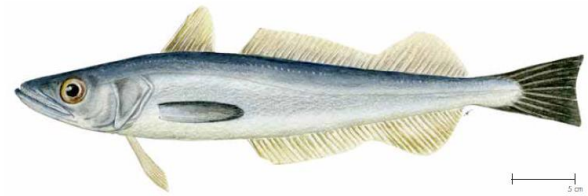
- GSA 17 - European hake, Red mullets, Common sole, Cuttlefish, Mantis shrimp, Deepwater rose shrimp, Hornet & Musky octopuses, and Norway lobster
- GSA 18 - Deepwater rose shrimp, Giant red shrimp, European hake, Norway lobster, and red mullets

Landing of main target species in the Adriatic Sea used in the SAC – GFCM stock assessments



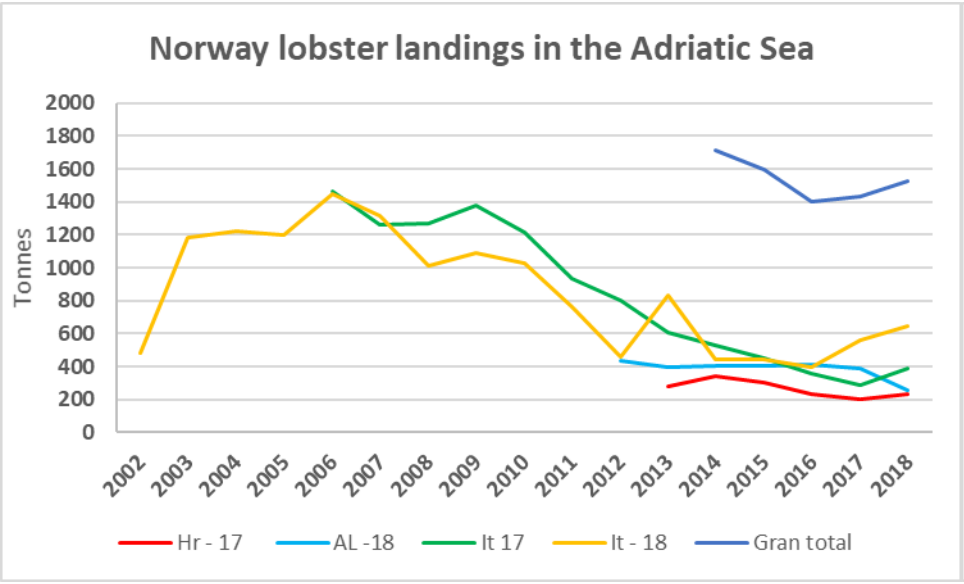


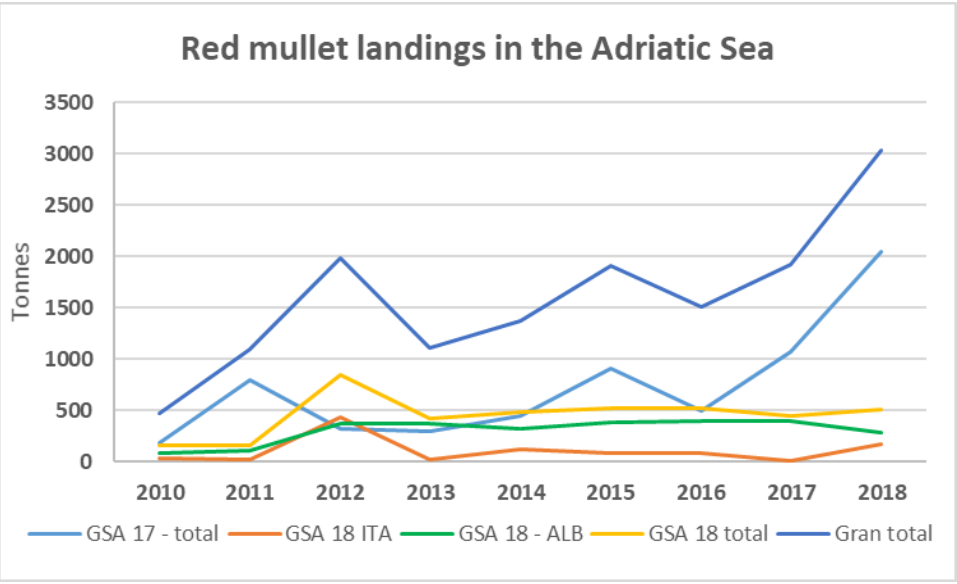
Merluccius merluccius (Linnaeus, 1758)



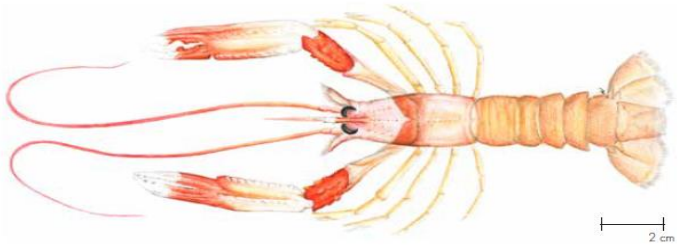
Solea solea (Linnaeus, 1758)

Landing of main target species in the Adriatic Sea used in the SAC – GFCM stock assessments

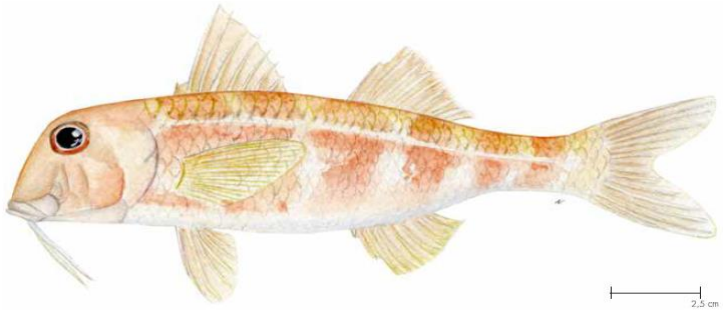




Nephrops norvegicus (Linnaeus, 1758)



Mullus barbatus Linnaeus, 1758

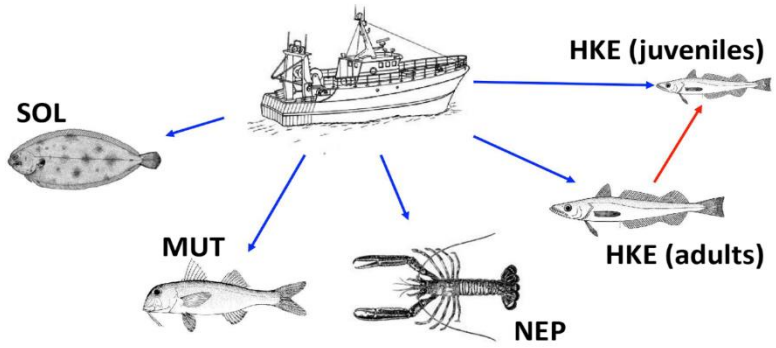


The status of demersal stocks in the Adriatic Sea according to the SAC-GFCM

Species	GSA	Fopt.	Fc	Fc/Fopt	Exploitation Level	Standing stock
Common cuttlefish	17	0.27	0.24	0.89	Sustainable	Low
Common sole	17	0.49	0.50	1.02	Low overfishing	Low
Mantis shrimps	17	0.43	0.37	1.16	Low overfishing	Low
Hake	17-18	0.17	0.47	2.76	High overfishing	Low
Norway lobster	17-18	0.42	0.71	1.69	High overfishing	Low
Red mullet	17-18	0.46	0.51	1.11	Low overfishing	High
Deep-water rose shrimp	17-18-19	0.5	1.67	3.34	High overfishing	High
Giant red shrimps	18-19	0.98	1.10	1.12	Low overfishing	High

Comparing measures for managing demersal fisheries in the Adriatic
The European project MANTIS

The target species for the MANTIS Project in the Adriatic Sea were *Nephrops norvegicus*, *Merluccius merluccius*, *Mullus barbatus*, and *Solea vulgaris*



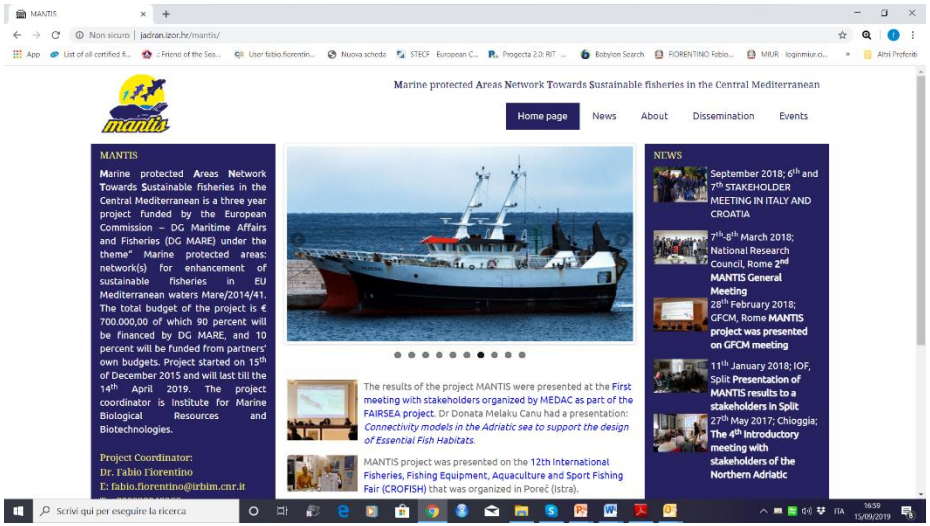
FINAL MEETING OF MPA PROJECTS *PROTOMEDEA*, *MANTIS* AND *SAFENET*
DG MARE, Brussels September 17th 2019

MANTIS: MARINE PROTECTED AREAS NETWORK TOWARDS SUSTAINABLE FISHERIES IN THE CENTRAL MEDITERRANEAN

Fiorentino F., Calleja D. A., Colloca F., Perez M., Prato G., Russo T., Sabatella R., Scarcella G., Solidoro C., Vrgoč N.

This project has been funded with support from the European Commission

http://jadran.izor.hr/mantis



The MANTIS web site
http://jadran.izor.hr/mantis

The main rationale of the MANTIS project

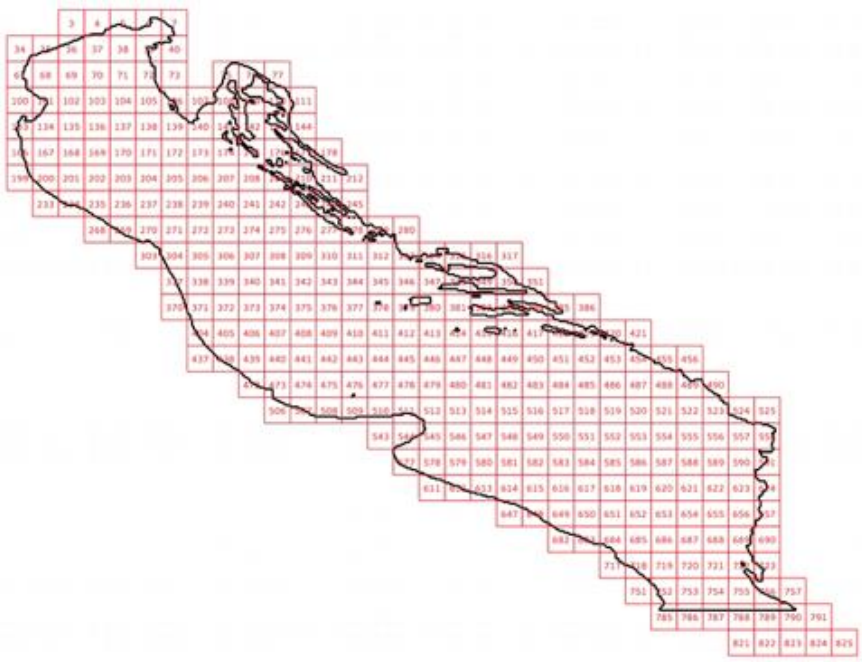
- Spatial domain defined as a grid of cells submultiple of the GFCM grid;

- Estimation of the spatial/temporal productivity (standardized LPUE or CPUE) by species, age, area, and time using:

  - **VMS data on fishing effort (E)**;

  - Logbook data or Landing data (often aggregated at weekly or monthly level);

  - Biological sampling of catches: age/length structure of catches by area and time

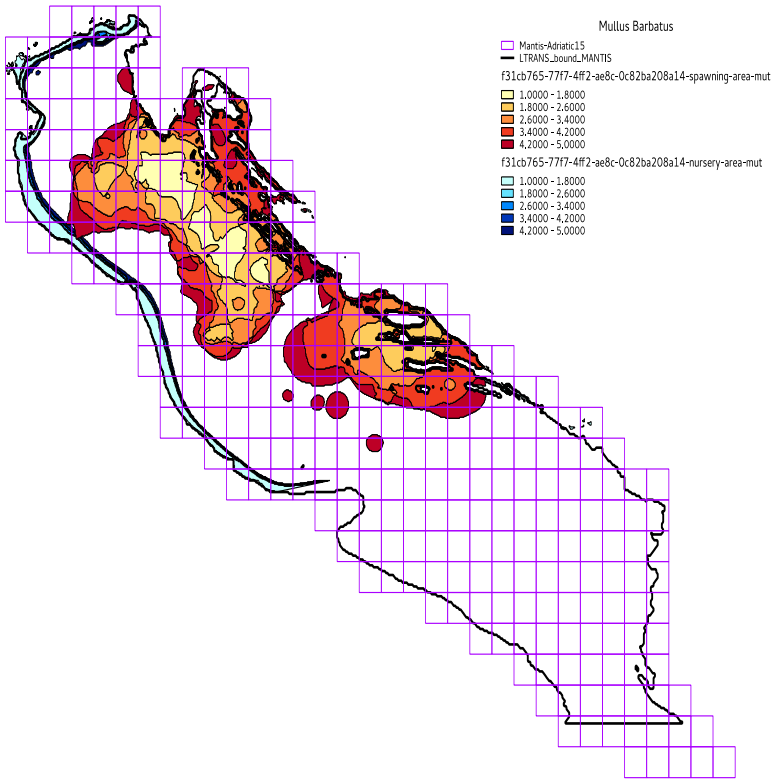


Estimating catch and simulating management scenarios by using the catch equation C= CPUE*E

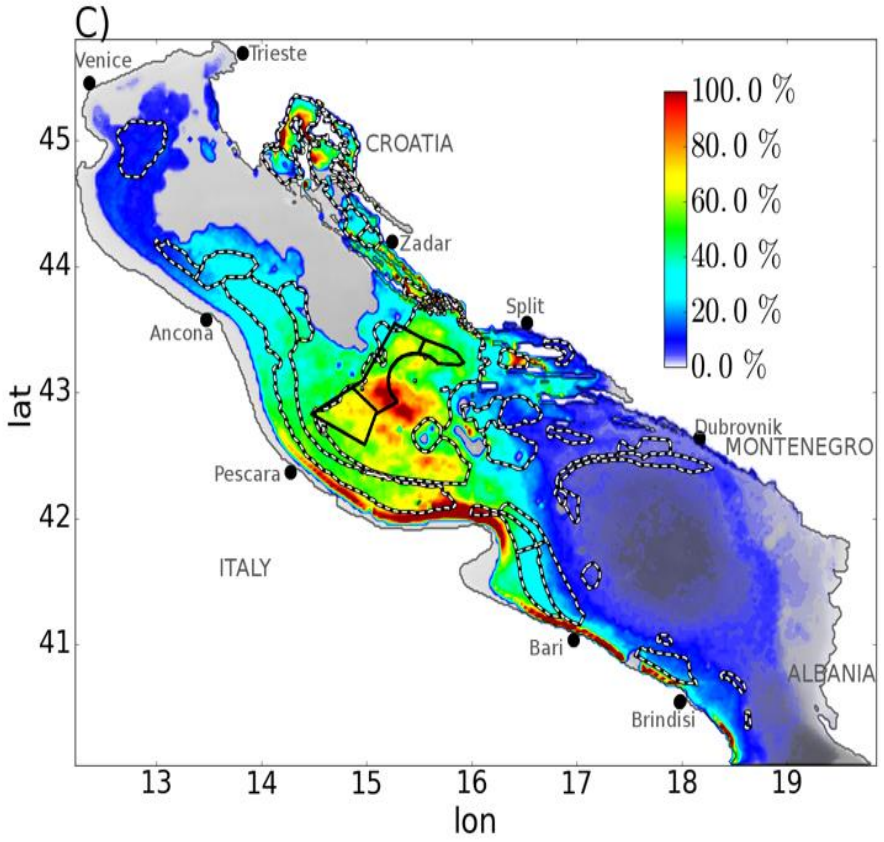
LPUE (Kg per meter of LOA per fishing hour)

To assess the effects of spatio-temporal based management measures it is crucial to know the connectivity of different vital phases of target species

The spatial distribution of spawning (in red) and nursery (in blue) areas of red mullet in the GSA 17 (MEDISeH project, and CampBiol data).



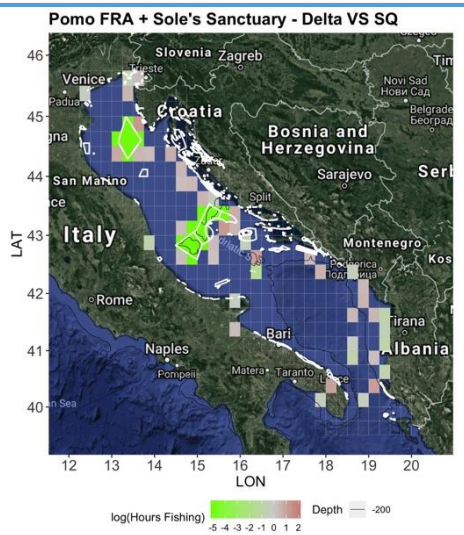
The success of settlement of Norway lobster juveniles in the GSA 17 and 18. The shaded white line defines the spawning area. Black lines define the area of fishery closures (MANTIS Project).

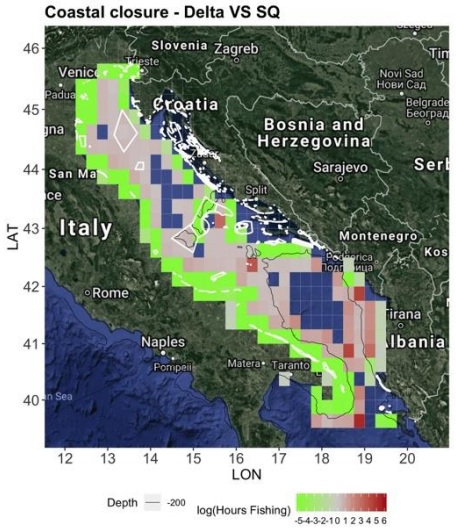


Simulated scenarios in the Adriatic Sea

Name	Type	Source	Capacity regulation	Effort regulation
Status quo	Capacity/Effort-based	-	None	None
Effort Regime	Capacity/Effort-based	Italian Governments and EU	-5% with respect to the Status quo	-8% of total annual effort for each vessel, with respect to the Status quo
Coastal closure	Spatial-based		None	None
Pomo Pit FRA	Spatial-based		None	None
Sole's Sanctuary	Spatial-based		None	None
Pomo Pit + Sole's Sanctuary	Spatial-based	MANTIS (researchers)	None	None
Extended Summer stop	Temporal-based	MANTIS (stakeholders)	None	Total stop in September and October -40% of effort in November and December

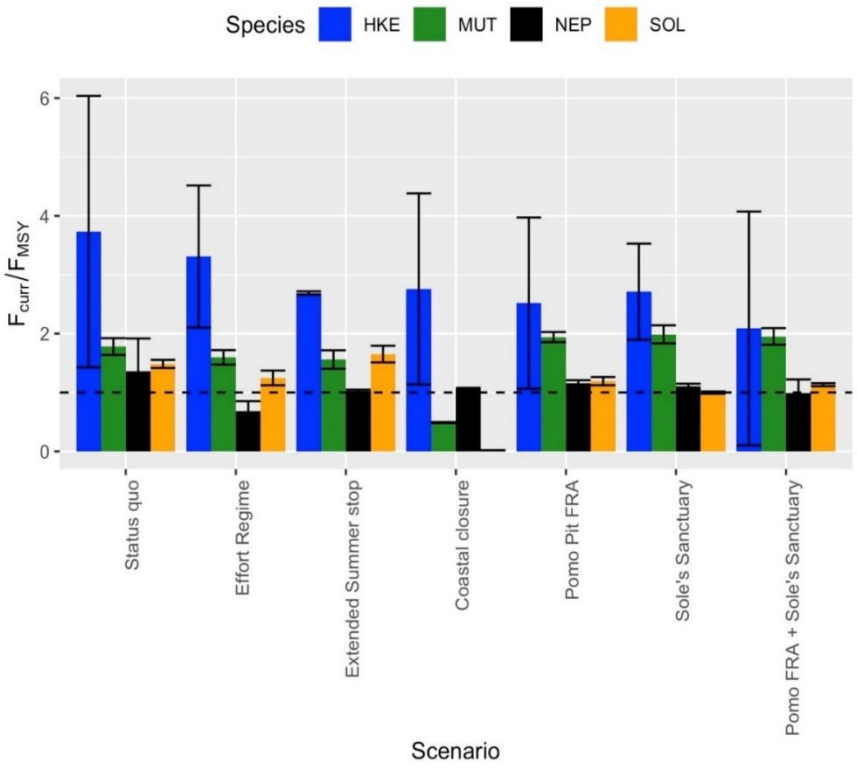
Variation of fishing effort as effect of space closures



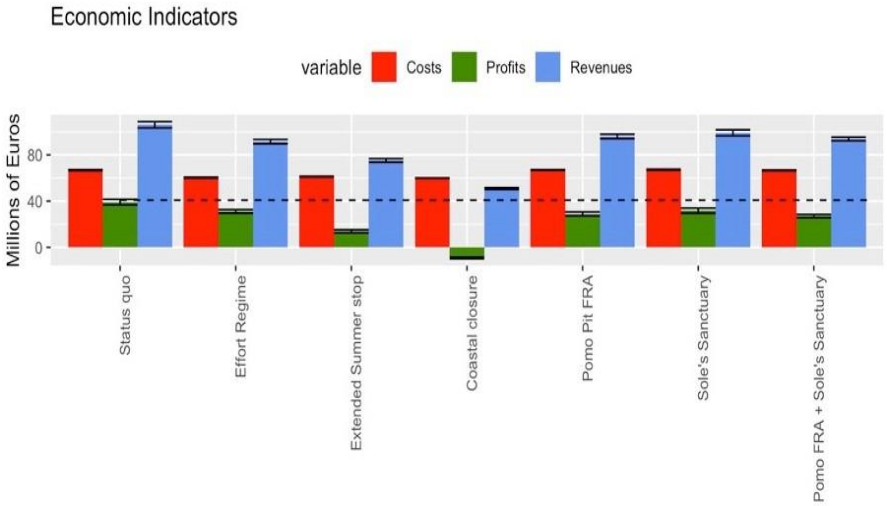


The effects fishing effort on fishing mortalities and economic performances of fisheries in different manangement scenarios

Overexploitation rate (F /F0.1) by species and scenario after the introduction of the different management measures.



Aggregated costs, revenues and incomes by scenario, for the Italian otter trawlers operating in the Adriatic Sea.



The main results of Mantis Project in comparing different management scenarios

i) **All measures reduce F with the exception of the Pomo Pit and Sole's Sanctuary FRAs for the red mullet and the Summer stop for the common sole**

ii) **the Sole Sanctuary produces a light improving in the sole SSB , while the Jabuka/Pomo Pit FRA is likely to determine strong increase of SSB of the Norway lobster**

iii) **the most effective measure results the all year around closure of the coastal area within 6 nautical miles from the coast, although its economic effects could be very negative for the fleet**

iv) **the Extended Summer stop scenario does not seem a promising approach in the Adriatic Sea.**