

"MEDAC-FG Strait of Sicily 22 February 2023"



The status of demersal stocks in the Strait of Sicily and some hints to improve their management

Fabio Fiorentino

Istituto per le risorse biologiche e le biotecnologie marine (**IRBIM**)

Consiglio Nazionale delle Ricerche (**CNR**)

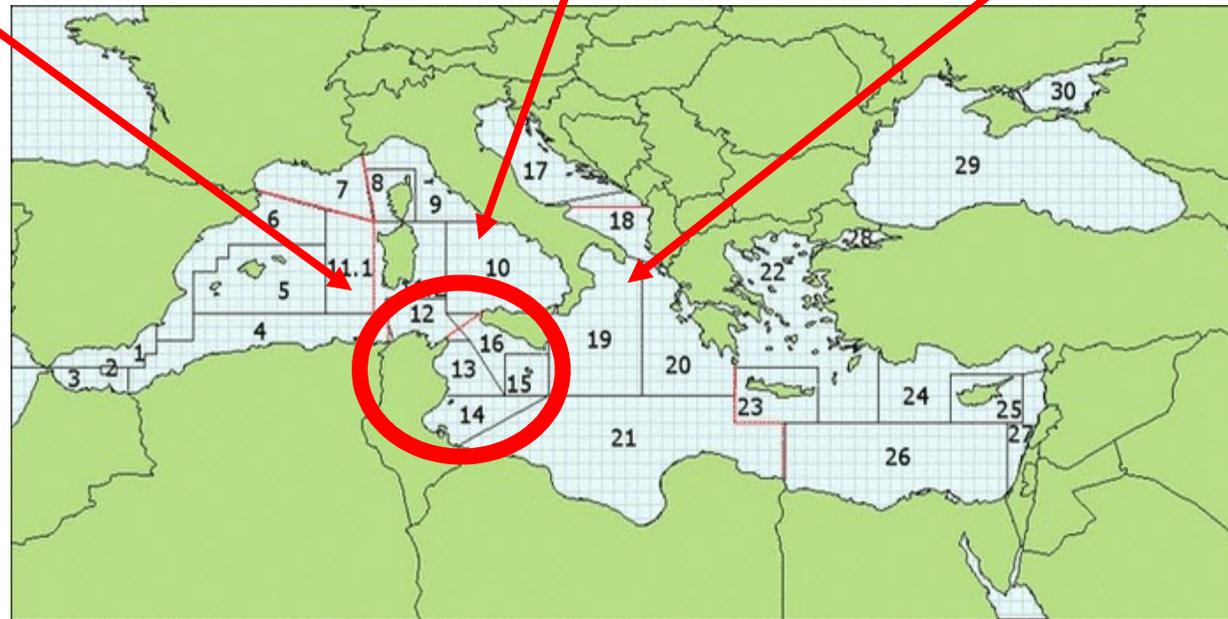
Mazara del Vallo

The target species of the Multi Annual management Plans in the Strait of Sicily adopted by the GFCM and EU...

Rec. GFCM/45/2022/4 :
Hake, and Deep water
rose shrimp

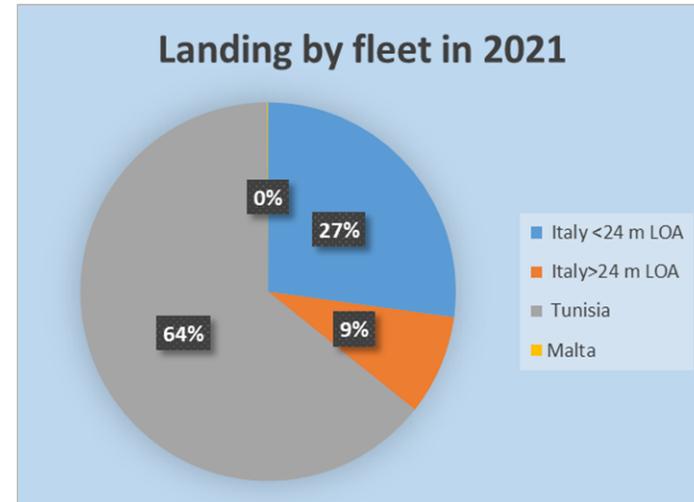
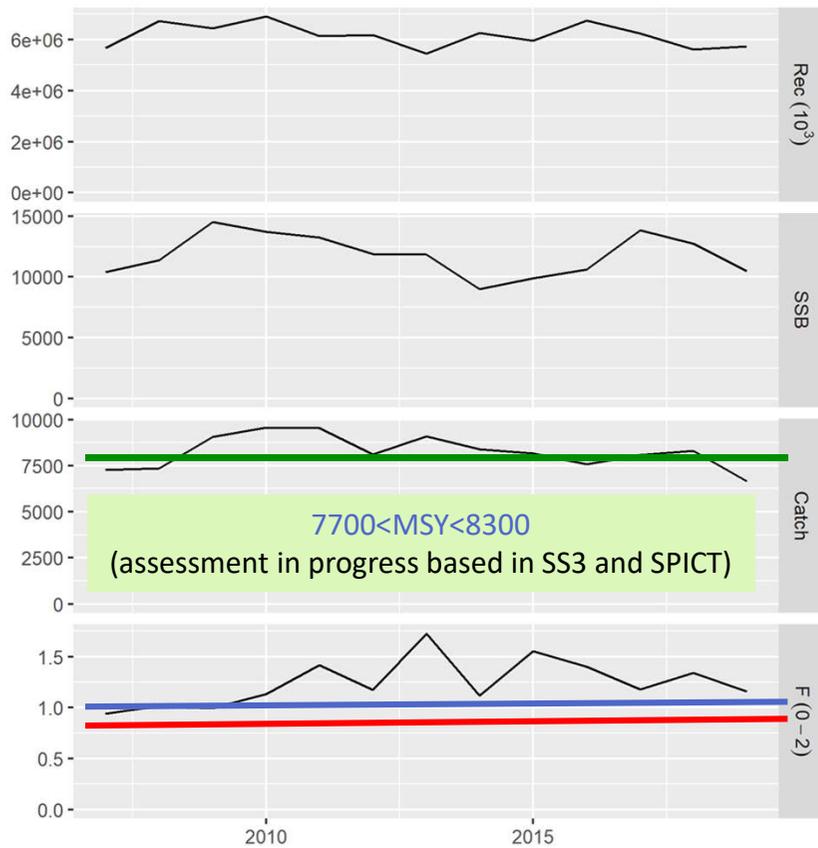
**Rec.
GFCM/45/2022/5**
Giant red shrimp,
and Red and violet
shrimp

Reg. 195/2023

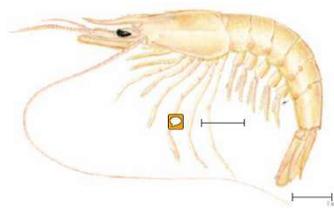
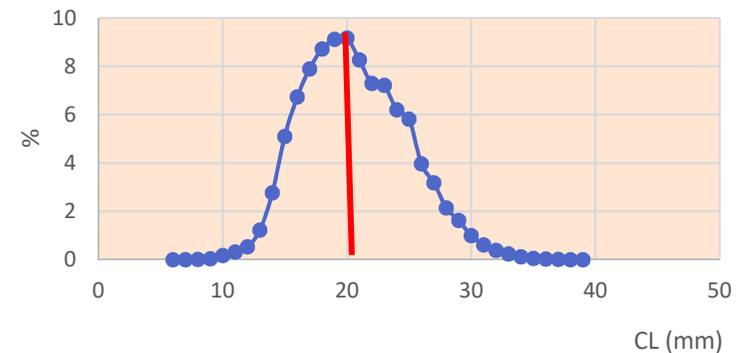


The case of deep water rose shrimp...a stock shared with EU and third countries...a yield in 2020 of 4300 t...of 6400 t in 2021.....the updated assessment of the status of the resource is in progress....

The old assessment based on XSA and data up to 2020



LFD of catches 2018-2021

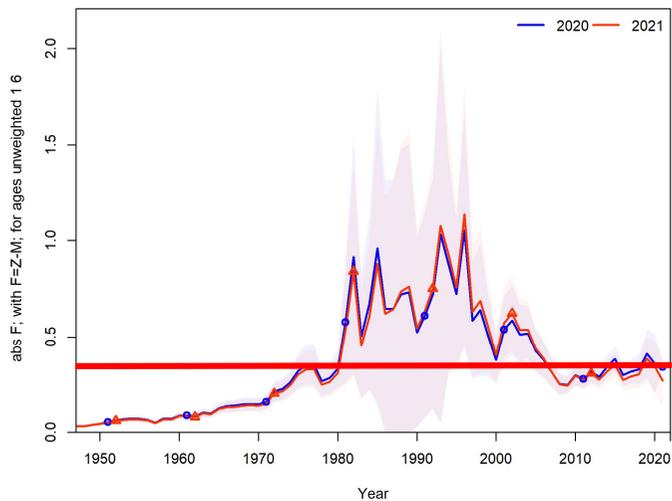
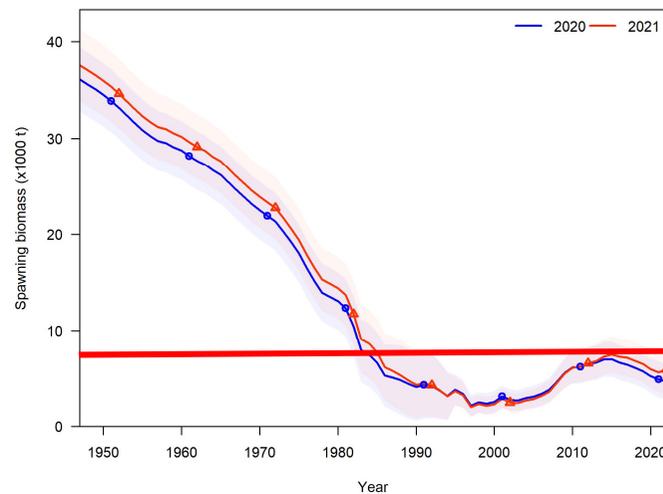
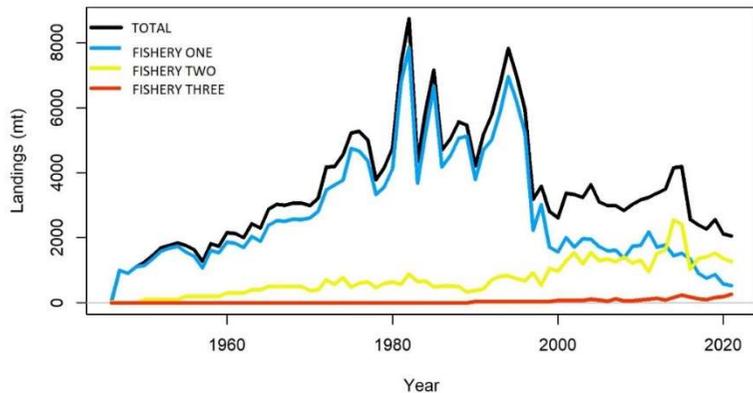
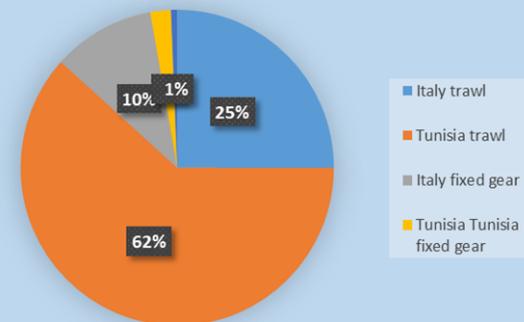


$F_{MSY} = 0.84-0.93;$
 $F_{MSY} = 1.0-1.1$
 (blue in progress)

(by Gancitano et al., 2021)

The case of hake...the main bycatch of the deep water rose shrimp fisheries...a yield of 2100 t in 2021...an improving but still overfished resource...

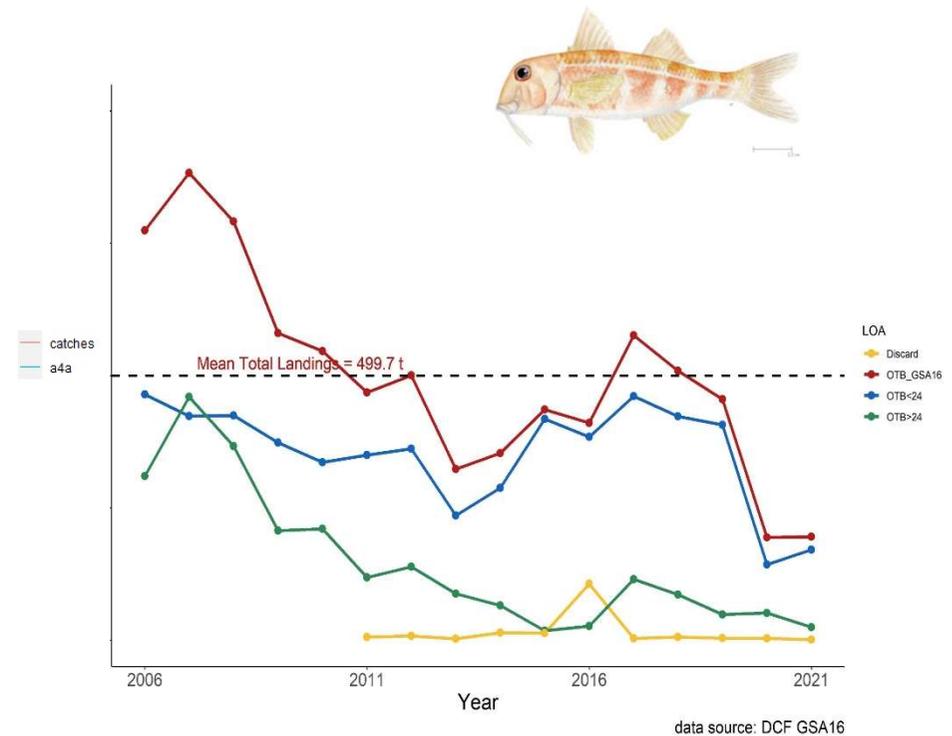
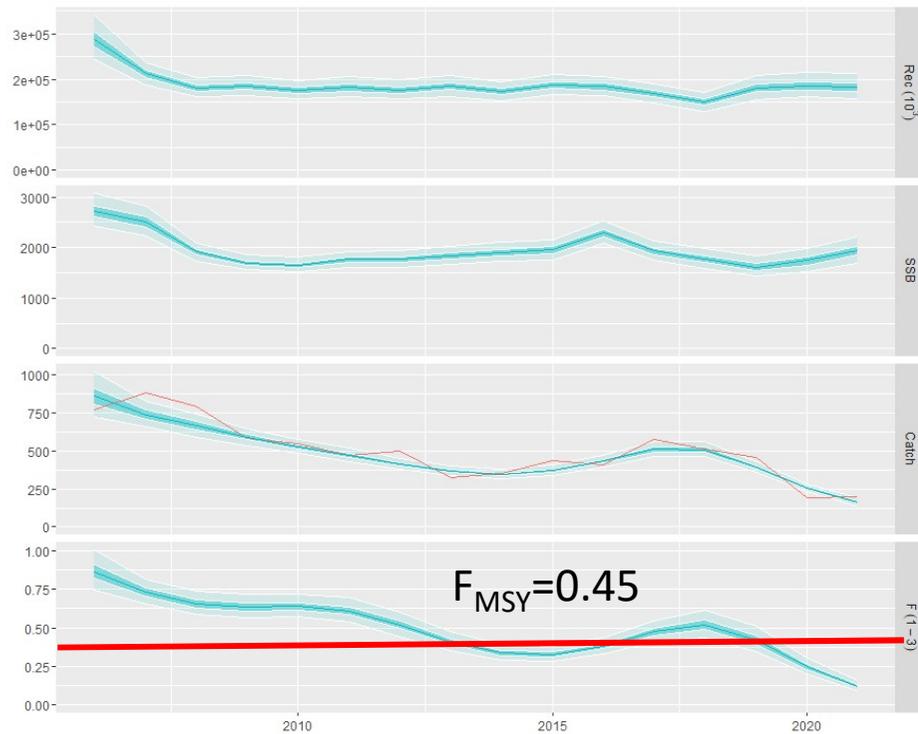
Landing by fleet in 2021



	2018	2019	2020	2021
F_{MSY}	0.29	//	//	//
SSB_{MSY}	7021	//	//	//
$Catch_{current}$	2274	2569	2118	2058
$F_{current}$	0.48	0.50	0.36	0.27
$F_{current}/F_{MSY}$	1.66	1.72	1.24	0.90
SSB (tonnes)	4397	4744	4885	5894
SSB/SSB_{MSY}	0.63	0.68	0.70	0.83

(by Falsone et al., 2022)

The case of red mullet in GSA 16...an example of sustainable European fisheries in the Mediterranean...a yield of about 200 t in 2021...



Red mullet off the southern coast of Sicily (GSA 16) is in sustainable exploitation:

- Nurseries within 3 miles protected from trawling;
- Reduction of bottom trawling targeting "fish and cephalopods"
- Trawling stop in autumn suitable to avoid capture of red mullet juveniles.

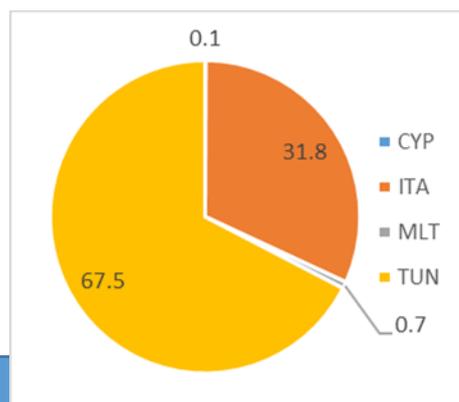
(by Scannella et al., 2022)

Recommendation GFCM/45/2022/4 on the management plan for the sustainable exploitation of demersal stocks the Strait of Sicily and Reg. EU 195/2023

Fishing opportunities in the Strait of Sicily (GSAs 12, 13, 14, 15 and 16) for the transitional period 2023-2025.

Maximum level of activity in fishing days in 2023-2025

Country	Segment	Typology	Vessels	Fishing days
CYP	T 12	Bottom Trawlers >24	1	51
ITA	T 07	Pelagic Trawlers < 24	594	90
ITA	T 10	Bottom Trawlers < 12		188
ITA	T 11	Bottom Trawlers < 24		19366
ITA	T 12	Bottom Trawlers >24		3657
MLT	T 11	Bottom Trawlers < 24	15	338
MLT	T 12	Bottom Trawlers >24		165



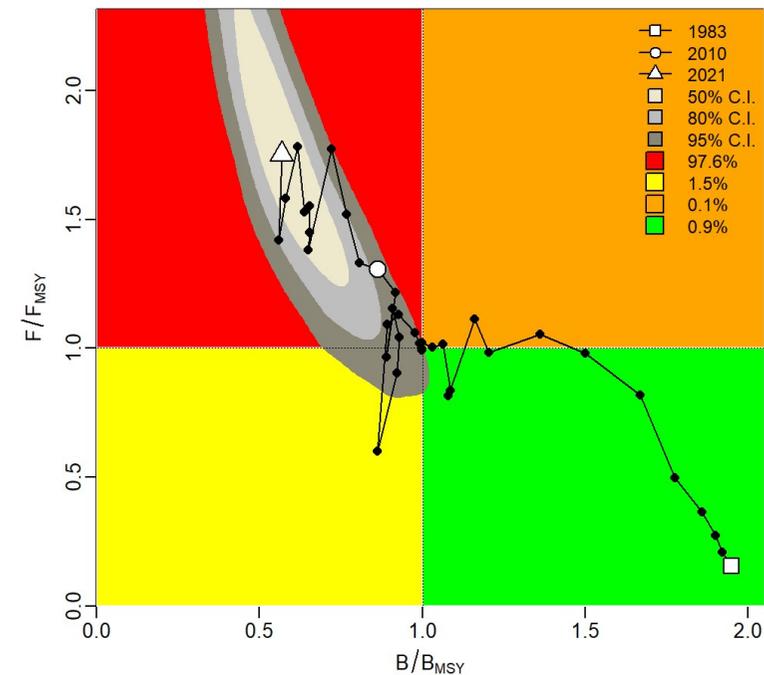
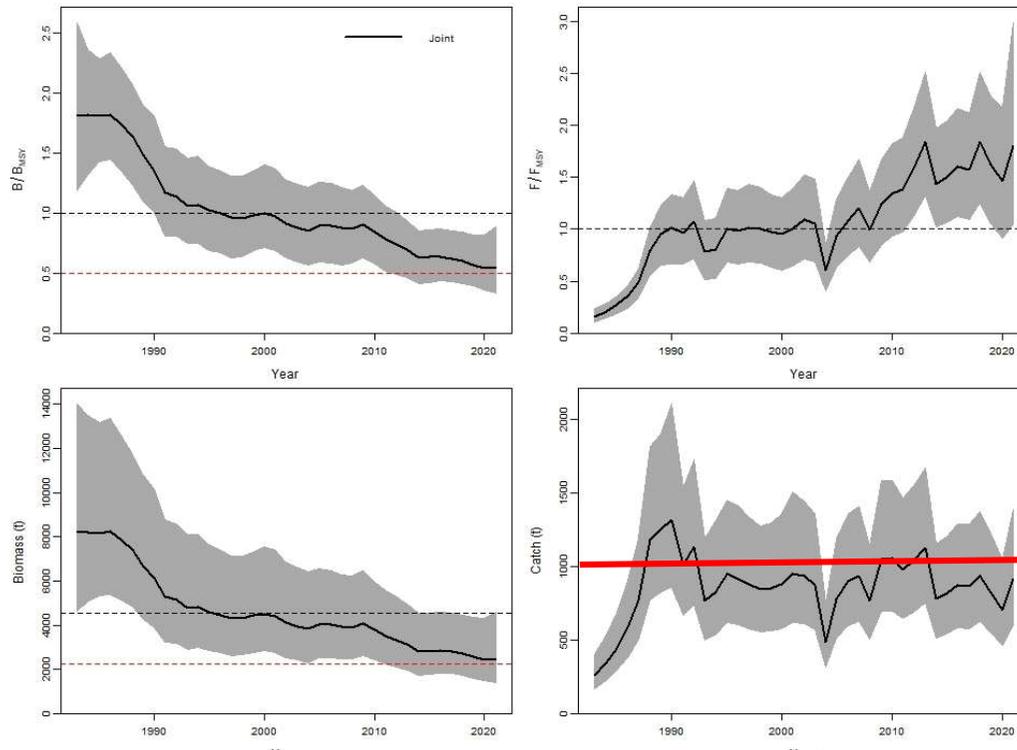
Quota by countries for 2023-2025

Maximum level of catches in tonnes live weight for 2023 = 6147 tonnes (65% Tunisia and 35 % EU)

EU 2023	EU 2024	EU 2025	TUN 2023	TUN 2024	TUN 2025
2154	2090	2026	3993	3874	3757

Maximum level of EU catches in tonnes live weight for 2023 by countries (2147, Italy; 1 Cypru; 6 Malta)

...the case of deep water red shrimp ...a fishery that is still Italian with a yield of 870 t in 2021...



$B/B_{MSY}=0,59$, $F/F_{MSY}=1,53$, $MSY=1.002\text{ t} \pm 94\text{ t}$

This is a single-species fishery so a combination of individual catch quotas along with technical measures that reduce the catch of juveniles may prove to be the best management strategy

(by Scannella et al., 2022)

Recommendation GFCM/45/2022/5 on the Deep Water Red Shrimp Management Plan in the Strait of Sicily (GSA 12 to 16) and Reg. EU195/2023

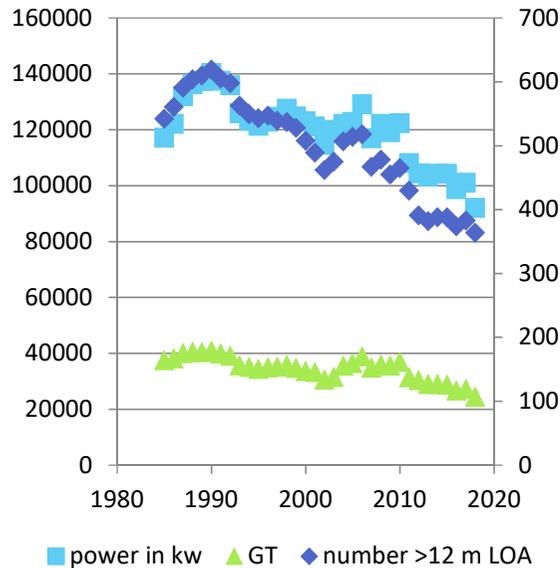
Maximum level of catches of Deep Water Red Shrimps (ARS+ARA) in tonnes live weight in 2023-2025

Species	EU 2023	EU 2024	EU 2025	TUN 2023	TUN 2024	TUN 2025
Catch limit (Tons) for giant red shrimp (ARS)	908	881	854	39	38	37
Catch limit (Tons) for blue and red shrimp (ARA)	104	101	98	126	122	119

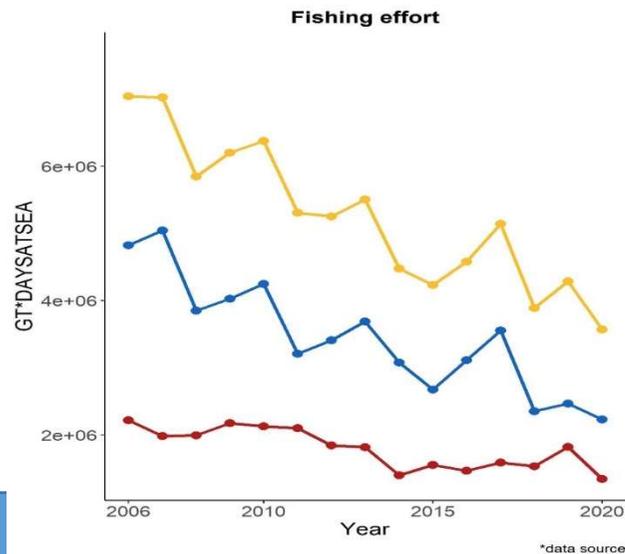
Vessels and catch distribution among the EU countries

Country	Vessels	ARS	ARA
Spain	2	1	1
Italy	320	870	101
Malta	15	35	2
Total	337	906	104

...the reduction of fishing effort in the Strait of Sicily...a policy limited to the European countries...



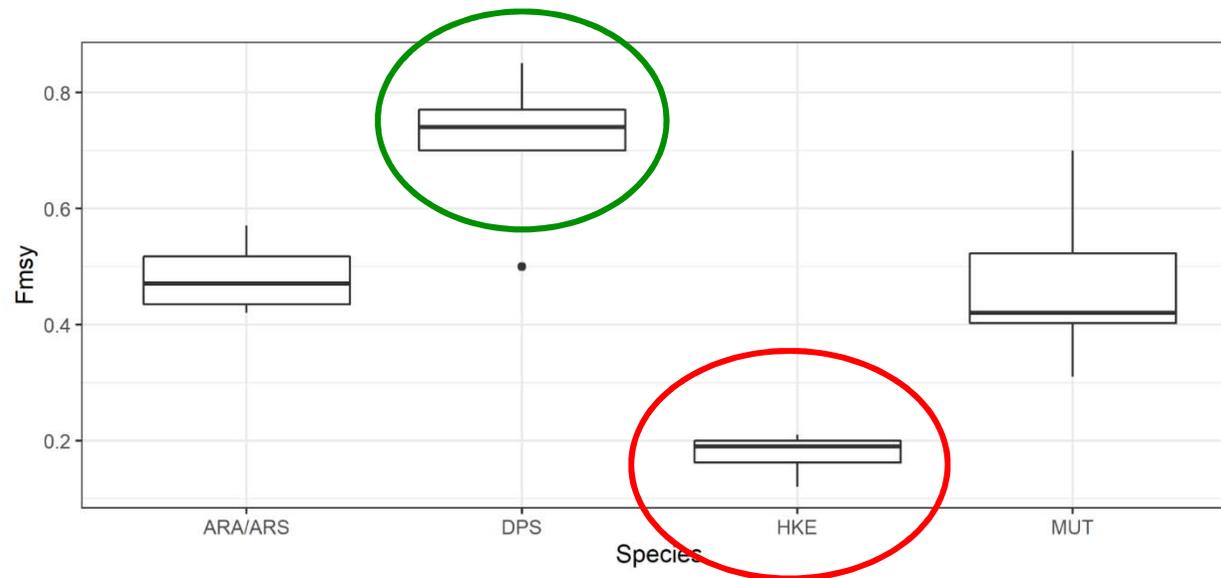
GSA	Species	Stock Status	Scientific Advice
12,13,14,15,16, 21w	ARS	Overexploited and in overexploitation	Immediate action to ensure a reduction in fishing mortality
12,13,14,15,16	HKE	Overexploited and in overexploitation	Reduce fishing mortality
12,13,14	MUT	In overexploitation, with relatively low biomass	Reduce fishing mortality
15	MUT	In overexploitation, with relatively low biomass	Reduce fishing mortality
16	MUT	Sustainable exploitation, with relatively low biomass	Do not increase fishing mortality
14	OCC	Overfishing	Reduce fishing mortality



...the reduction in fishing effort is limited to European countries...this different management policy seems to be reflected in a higher level of overfishing of resources fished exclusively by third country fleets and it could affect the state of exploitation of shared resources ...

How can we improve the management of demersal fisheries in the Strait of Sicily? The problem of multispecies fisheries...

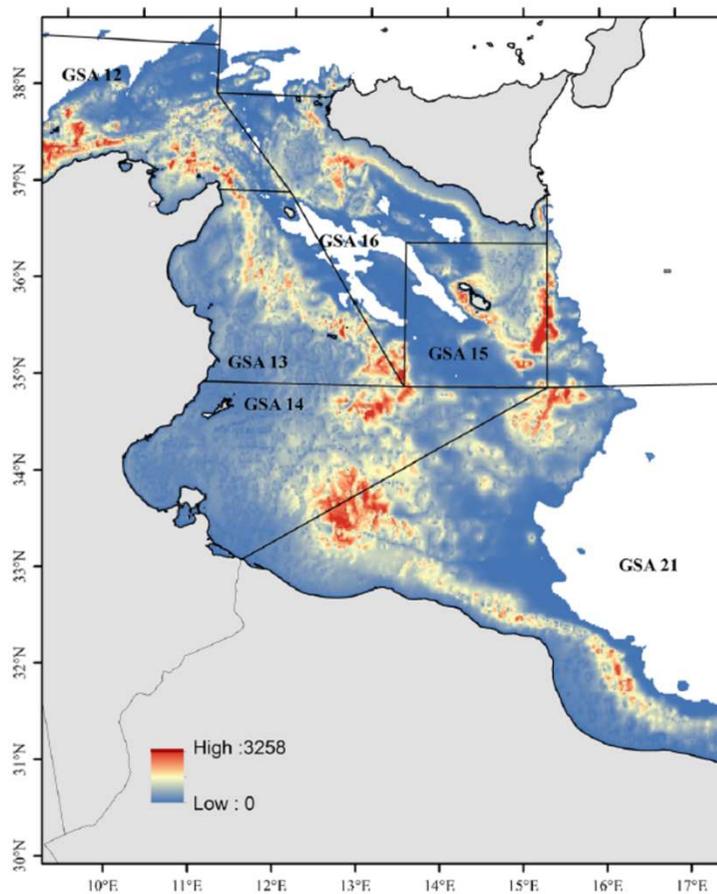
In multi-species fisheries, such as **deep water rose shrimp** trawl fisheries whose main commercial bycatch is **hake**, fishing effort should be managed so as **to maximize the catch of commercial-size shrimp while minimizing that of hake**



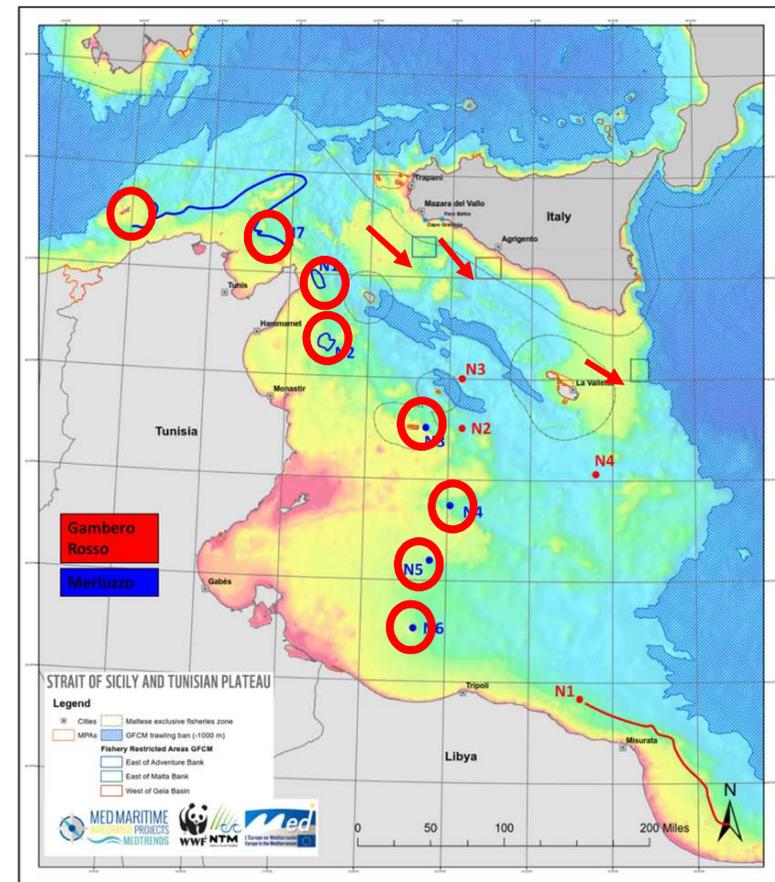
Different levels of optimal F for the main target species of the demersal fisheries in the Strait of Sicily

(by Fiorentino e Vitale, 2021)

How can we improve the management of demersal fisheries in the Strait? The protection from trawling of areas where juveniles of commercial and protected species are concentrated... the integration of scientific research (left) with fishers' knowledge (Traditional Ecological Knowledge) (right)...



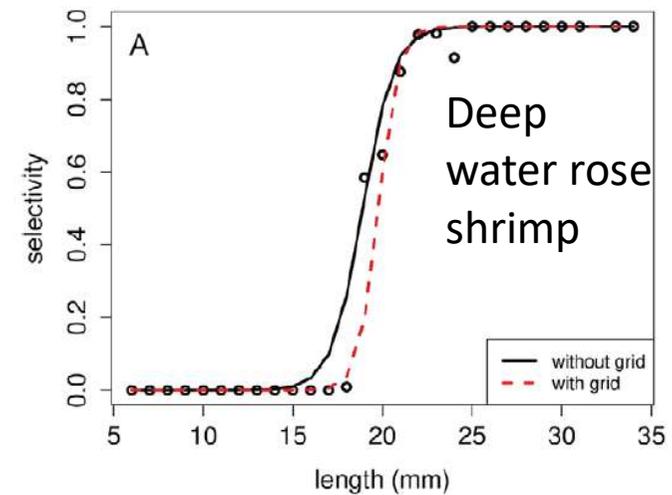
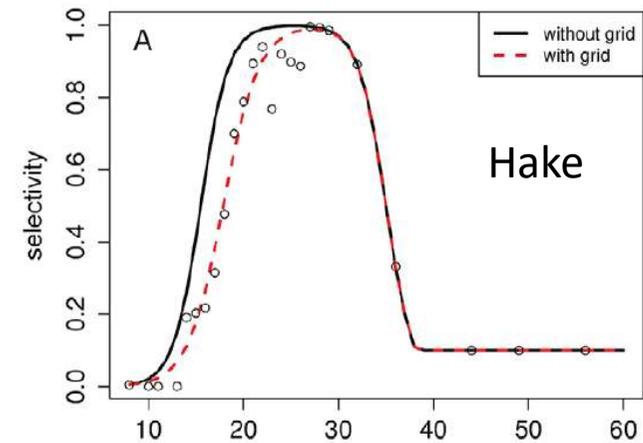
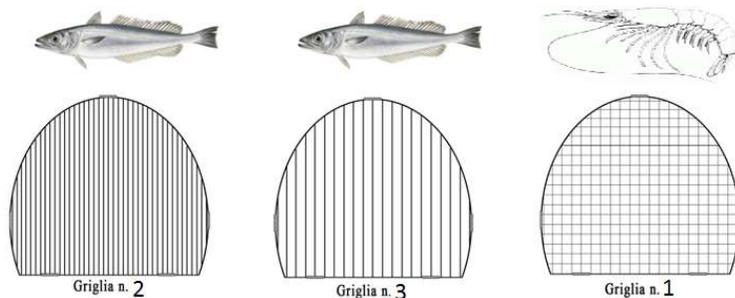
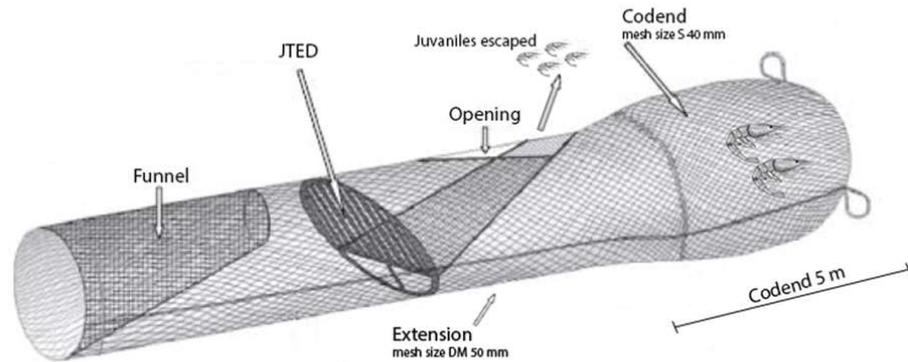
(by Garofalo et al., 2018)



(by Fiorentino et al., 2019)

How can we improve the management of demersal fisheries in the Strait? Experimentation with new, more selective fishing gear...

In addition to "spatial" measures to reduce undersized catches and preserve sensitive habitats, new fishing gears that are more selective and reduce the impact of fishing on the environment and resources need to be tested on a large scale.

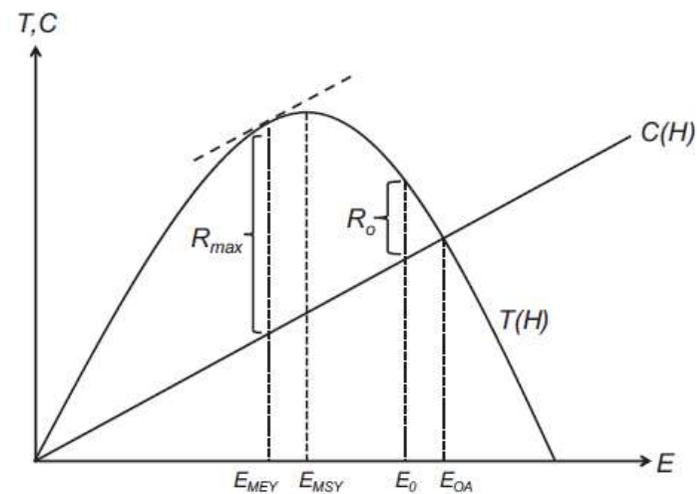


(by Vitale et al., 2018)

How can we improve the management of demersal fisheries in the Strait? Global change and conflicts in use of fishery resource between EU and non-EU countries...

The exploitation of the same resource for an international market by countries with different socio-economic characteristics creates distortions in the market and is likely to rapidly lead stocks into heavy overfishing conditions.

...the relationship between fishing effort (E), total social costs (C) and total revenues (T)...



(by Nielsen et al., 2014)

Products fished by European fleets need to be protected (quality/ecolabelling marks) from competition with the same products fished by third-country fleets without compliance with the EU's sustainability criteria

Some conclusive suggestions to improve fishery management in the Strait of Sicily

- **Balance fishing effort to the productive capacities** of the resources taking into account **climate change**;
- **Improve gear selectivity** by reducing the discarded fraction of catches (precision fishing);
- **Protect areas** where critical phases of the life cycles of fishery resources (**recruitment and reproduction**) and protected and/or species indicator of **sensitive habitats** are concentrated (precision fishing);
- **Develop a permit regime** that regulates **access to fishing areas**, compatible with the philosophy behind the CFP and GFCM Management Plans, and allows for overcoming the outdated "free fishing in free seas" philosophy.
- **Hold fishers responsible** for the productivity of **their allocated fishing areas** in accordance with the **FAO Code of Conduct for Responsible Fisheries** and in the logic of the **Ecosystem Approach to Fishery Management**.
- **Protect UE fish production** from third country competition through traceability, ecolabelling, MSC and more strict import controls.

References

- Falsone F., F. Fiorentino, V. Gancitano, D. Scannella, F. Colloca, O. Ben Abdallah, S. Ben Meriem, O. Jarboui, M. Cherif, F. Di Maio, J. Mifsud, M. Gambin, S. Fezzani, F. Quattrocchi, S. Vitale, L. Ceriola, E. Arneri, M. Cardinale (2022) Stock Assessment Form of Hake (*M. merluccius*). Reference year: 2020; Reporting year: 2022. 32 pp. https://gfcml.sharepoint.com/EG/SitePages/Meetings/WGSAD_Yr_.aspx?RefYear=2022.
- Fiorentino F., Calleja D., Colloca F., Perez M., Prato G., Russo T., Sabatella R., Scarcella G., Solidoro C., Vrgoč N. (2019) MANTIS: Marine protected Areas Network Towards Sustainable fisheries in the Central Mediterranean. Final report. Marine protected areas: network(s) for enhancement of sustainable fisheries in EU Mediterranean waters. European Commission. Directorate-General for Maritime Affairs and Fisheries. ISBN 978-92-76-17170-6. doi: 10.2771/33931. 333pp. <https://op.europa.eu/en/publication-detail/-/publication/11251e93-f17e-11ea-991b-01aa75ed71a1/language-en/format-PDF>.
- Fiorentino F., Vitale S. (2021) How Can We Reduce the Overexploitation of the Mediterranean Resources? *Front. Mar. Sci.* 8:674633. <https://www.frontiersin.org/articles/10.3389/fmars.2021.674633/full>.
- Gancitano V., D. Scannella, F. Falsone, S. Fezzani, M. Cherif, S. Ben Meriem, O. Ben Abdallah, L. Ceriola, O. Jarboui, M. Gambin, J. Mifsud, L. Pisani, S. Vitale, F. Fiorentino (2022) Stock Assessment Form of DPS (*P. longirostris*) in combined GSAs 12-16. Reference year: 2020; Reporting year: 2022. 36 pp. https://gfcml.sharepoint.com/EG/SitePages/Meetings/WGSAD_Yr_.aspx?RefYear=2022.
- Garofalo G., Fezzani S., Gargano F., Milisenda G., Ben Abdallah O., Ben Hadj Hamida N., Jarboui O., Chemmam-Abdelkader B., Khoufi W., Micallef R., Mifsud R., Gancitano S., Rizzo S., Zgozi S., Ceriola L., Arneri E., Fiorentino F. (2018) - Predictive distribution models of European hake in the south-central Mediterranean Sea. *Hydrobiologia*, 821(1): 153-172. <https://doi.org/10.1007/s10750-017-3338-5>.
- GFCM (2022) Forty-fifth session of the Commission Tirana, Albania, 7–11 November 2022. Appendices 7 and 8.
- Nielsen, M., Ravensbeck, L., & Nielsen, R. (2014). Green growth in fisheries. *Marine Policy*, 46, 43-52. <https://www.sciencedirect.com/science/article/pii/S0308597X14000050>.
- Council Regulation (EU) 2023/195 of 30 January 2023 fixing for 2023 the fishing opportunities for certain stocks and groups of fish stocks applicable in the Mediterranean and Black Seas and amending Regulation (EU) 2022/110 as regards the fishing opportunities for 2022 applicable in the Mediterranean and the Black Seas.
- Scannella D., V. Gancitano, F. Falsone, M.L. Geraci, G. Sardo, S. Vitale, L. Ceriola, G. Sinacori, S. Gancitano, P. Rizzo, C. Badalucco, P. Chirco, D. Massi, A. Titone, F. Fiorentino (2022) Stock Assessment Form of Red mullet (*M. barbatus*) in GSA 16. Reference year: 2020; Reporting year: 2022. 24 pp. https://gfcml.sharepoint.com/EG/SitePages/Meetings/WGSAD_Yr_.aspx?RefYear=2022.
- Scannella D., Jarboui O., Mifsud J., Falsone F., Rjeibi O., Gambin M., Gancitano V., Albanozzo M., Vitale S., Ceriola L., Fiorentino F. (2022) Stock Assessment Form of Giant red shrimp (*A. foliacea*) in combined GSAs 12-16. Reference year: 2020; Reporting year: 2022. 38 pp. https://gfcml.sharepoint.com/EG/SitePages/Meetings/WGSAD_Yr_.aspx?RefYear=2022.
- Vitale S., Milisenda G., Gristina M., Baiata P., Bonanomi S., Colloca F., Gancitano V., Scannella D., Fiorentino F., Sala, A. (2018). Towards more selective Mediterranean trawl fisheries: are juveniles and trash excluder devices effective tools for reducing undersized catches? *Scientia Marina*, 82(S1): 215-223. <https://doi.org/10.3989/scimar.04751.28A>.