

FG East Med & FG Strait of Sicily  
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Overview of possible management measures for the forthcoming MAPs in the Strait of Sicily taking into account the social aspects of the pilot studies and the achievement of sustainability objectives.

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## Main goals of the presentation

- Summarize main information on the existing **MAP on demersal fisheries in the Strait of Sicily** which will be revised next year;
- Examine the **results achieved** considering the **international context** of these fisheries;
- Identify **areas to be further improved** for a more effective management of demersal resources in the Strait of Sicily

## ***The GFCM multiannual management plan (MAP) for bottom trawl fisheries exploiting demersal stocks in the Strait of Sicily (geographical subareas 12 to 16)***

### The story of the MAP ...

- **REC-GFCM/39/2015/2** on the establishment of a set of minimum standards for bottom trawling fisheries of demersal stocks in the Strait of Sicily, including a common minimum reference conservation size of 20 mm CL for Deep water rose shrimp and 20 cm total length for hake, pending the development and adoption of a multiannual management plan;
- **REC-GFCM/40/2016/4** establishing a multiannual management plan for the fisheries exploiting European hake (HKE) and deep-water rose shrimp (DPS) in the Strait of Sicily (GSA 12 to 16) and applies to vessels operating with bottom trawls over 10 meters in total length when the total catch of these species represents at least 25% of the catch in live weight or value);
- **REC-GFCM/41/2017/8** on an international joint inspection and surveillance scheme outside the waters under national jurisdiction of the Strait of Sicily (geographical subareas 12 to 16);
- **REC -GFCM/42/2018/5 on a multiannual management plan for bottom trawl fisheries exploiting demersal stocks in the Strait of Sicily (geographical subareas 12 to 16), repealing Recommendations GFCM/39/2015/2 and GFCM/40/2016/4;**
- **REC-GFCM/43/2019/6** On management measures for sustainable trawl fisheries targeting giant red shrimp and blue and red shrimp in the Strait of Sicily (geographical subareas 12, 13, 14, 15 and 16).
- **REC-GFCM 44/2021/12** amending Recommendation GFCM/42/2018/5 on a multiannual management plan for bottom trawl fisheries exploiting demersal stocks in the Strait of Sicily (geographical subareas 12 to 16)

*The GFCM multiannual management plan (MAP) for bottom trawl fisheries exploiting demersal stocks in the Strait of Sicily (geographical subareas 12 to 16)*

## **Scope and subject matter of the MAP...**

The MAP aims to manage **bottom trawl fisheries exploiting demersal stocks in the SoS;**

The MAP is applied to **bottom trawlers above 10 metres length overall.**

## **Some innovative ideas...**

- **“Designated landing ports”** i.e. ports/places designated on a regional where landings, transshipments, packaging and/or processing operations of fishery products are permitted;
- **“Fishing authorization”** i.e. a fishing authorization entitling a vessel to engage in fishing activities for demersal stocks, including HKE and DPS, during a specified period and in a given area.

## *Specific objectives...*

The MAP intends to:

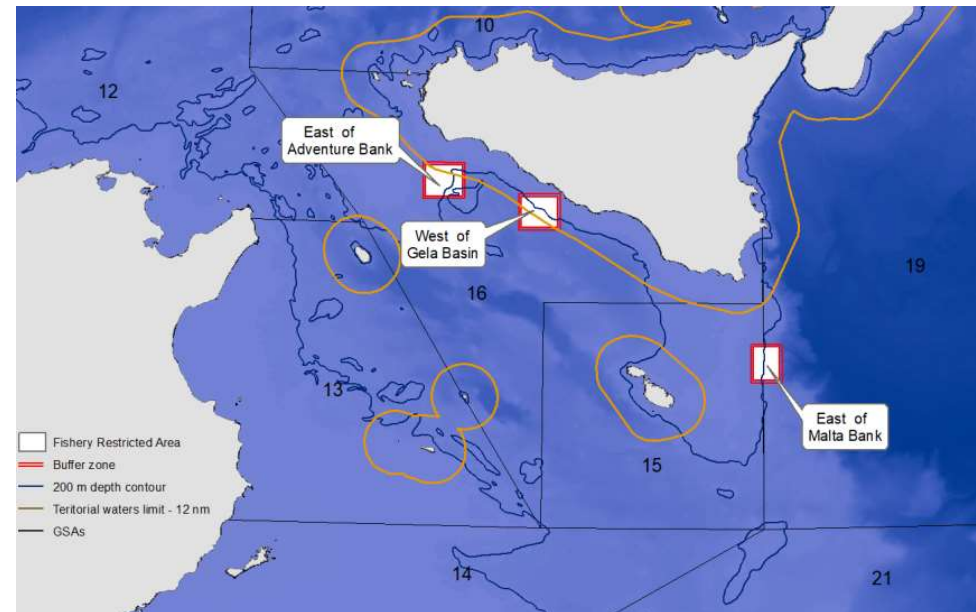
- a) Apply the precautionary approach to fisheries management;
- b) **Ensure** that **exploitation** levels of HKE ( $0.12 < FMSY < 0.18$ ) and DPS ( $0.84 < FMSY < 0.93$ ) are **at MSY** by 2020 at the latest;
- c) **Protect essential fish habitats** that are important for the stocks of HKE and DPS in the Strait of Sicily;
- d) Gradually **eliminate discards**, by avoiding and reducing, as far as possible, unwanted catches, and by gradually ensuring that all catches are landed;
- e) **Adjust the fishing capacity** of the fleets to levels of fishing mortality **consistent with MSY**, with a view to having economically viable fleets and without overexploiting marine biological resources.

## *Technical measures - Minimum conservation reference size*

- The **minimum conservation reference size (MCRS)** is set to **20 mm carapace length for DPS** and **20 cm total length for HKE**.
- Contracting parties and cooperating non-contracting parties (CPCs) have to communicate annually to the GFCM **the specific modalities they apply to avoid discards** which are in force in some CPCs as well as landing inspection modalities at the national level.
- CPCs have to communicate to the GFCM **the spatial restrictions in the waters under their jurisdiction** that they apply to protect spawning and nursery areas for demersal stocks, including HKE and DPS.

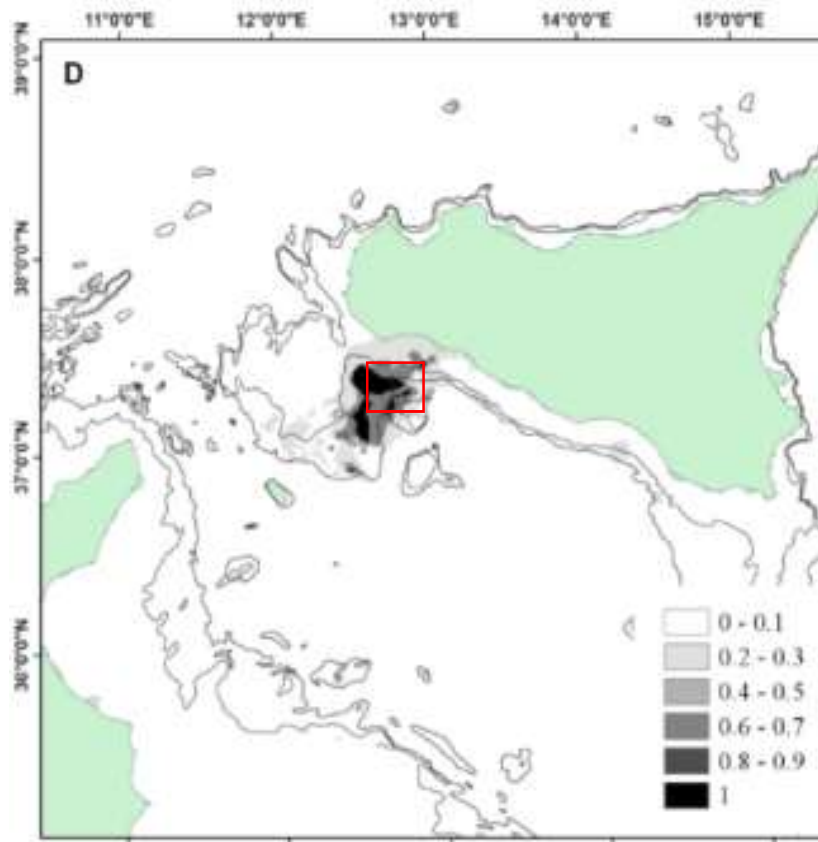
***Fisheries restricted areas (FRAs) aim at protection of the Essential Fish Habitats (nurseries and spawning areas) of HKE and DPS in the Strait of Sicily***

- Any fishing activity with bottom trawlers irrespective of their overall length are not allowed in the FRAs. To avoid accidental access to the FRAs, buffer areas extending one nautical mile beyond the FRAs are established.
- For any fishing activity with bottom trawlers in the buffer areas vessels have to ensure that their vessel monitoring system (VMS) is fully functional before entering the buffer zone.
- **The SAC is asked to identify additional nursery areas of European hake in the entire Strait of Sicily.**

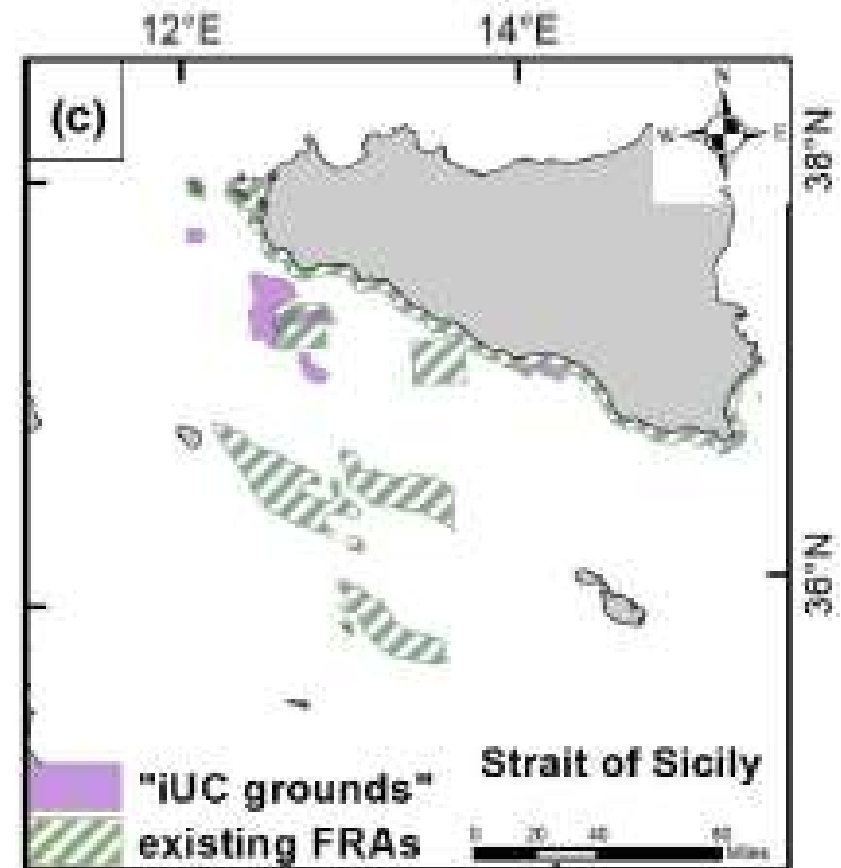


(from Garofalo & Fiorentino, 2022)

The FRA East of Adventure Bank overlaps the critical area of production of undersized individuals (under MRSC) of HKE, DPS and *T. trachurus*



Overlap between FRA and Interspecific persistent hotspot of undersized organisms (from Milisenda et al., 2021)



Overlap between persistent area of increased quantities of Undersized Catch ("iUC grounds") (From Despoti et al., 2020)

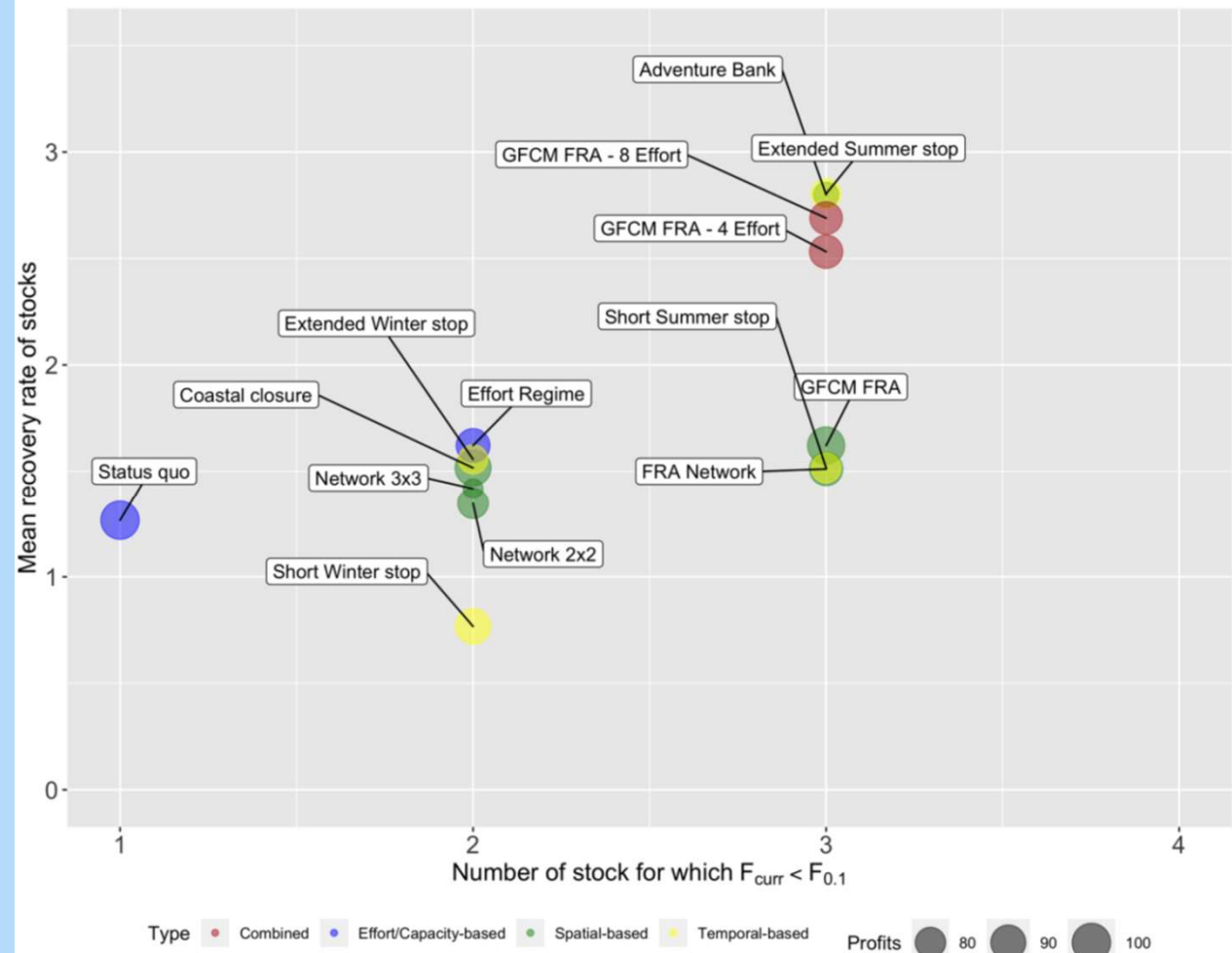


## Some simulations on stock status and Italian fishery performances under different management scenarios

i) the closure of the three established GFCM FRA are likely to allow reaching  $F_{0.1}$  for three stocks considered with exclusion of Hake

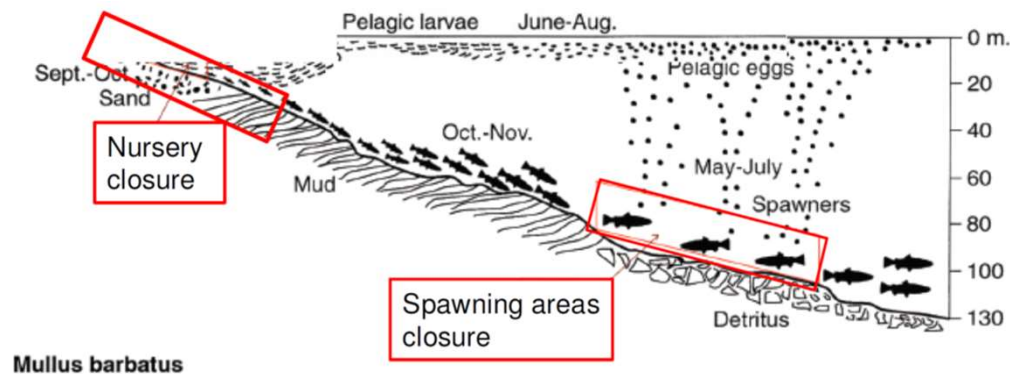
ii) an Extended Summer stop, i.e. the full temporal ban of trawling for 2 months followed by other two months of reduced activity, is another potentially effective approach (but costly)

iii) all the management scenarios are always associated, at least in their first phase of entry into force, to a decrease of the profit for the fleet with respect to the status quo



## Temporal closure

- Any fishing activity with bottom trawlers irrespective of their overall length is not allowed between the coast and the 200 m depth in GSA 14 (Gulf of Gabès). This closure shall apply every year from 1 July until 30 September.



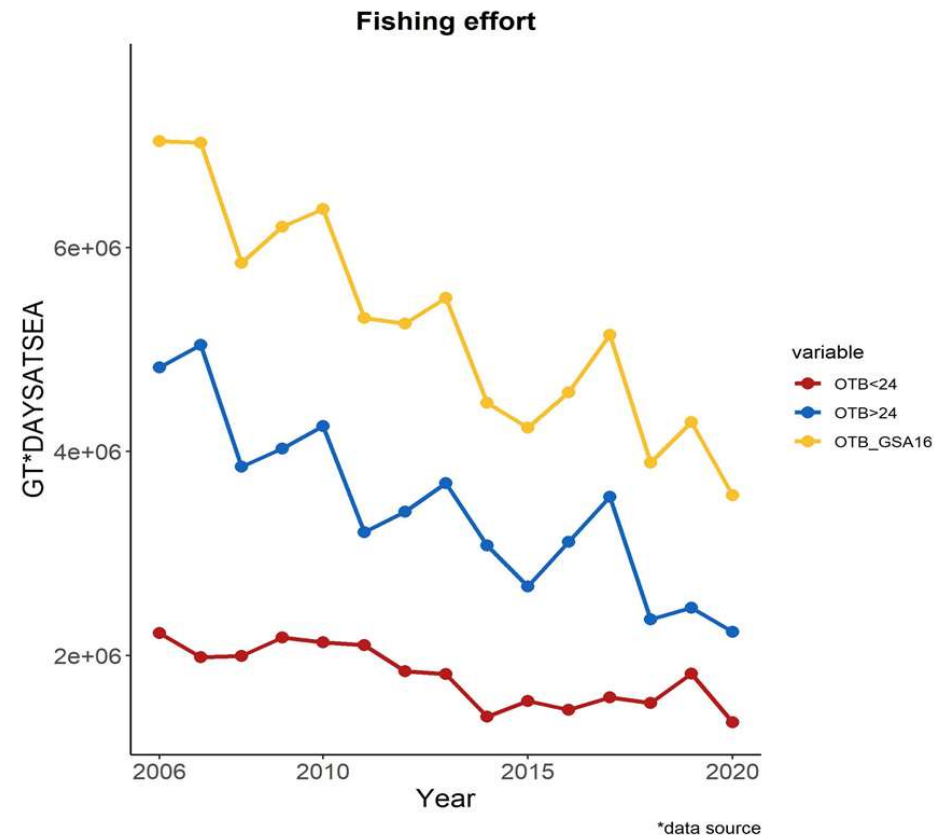
(from Caddy, 1999)

## Fleet and effort management measures

- Bottom trawlers are allowed to carry out specific fishing activities in the Strait of Sicily if authorized by the CPCs. Such vessels shall be equipped with a VMS.
- The CPCs maintain and keep up-to-date a register of the fishing authorizations.
- The CPCs communicate to the GFCM Secretariat:
  - The list of operating vessels for which such authorization has been delivered for the following year(s);
  - A report on fishing activities carried out by the authorized vessels in terms of number of fishing days, exploitation area (GSAs), catches and discards of HKE and of DPS g from 2019.

# Fleet and effort management measures

- The CPCs are encouraged to ensure **fishing capacity reduction measures or fishing effort restrictions**. The SAC is invited to formulate advice aiming at improving the efficiency of such measures.
- The CPCs shall take the necessary measures **to reduce the fishing mortality of HKE and DPS** in the Strait of Sicily and align them with **the objectives of reaching MSY by 2020**. Measures should be considered in terms of number of fishing days, fishing vessels and catch limits.



(from Gancitano et al., 2022)

## *National management plans*

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- In order to ensure adequate conservation of demersal stocks, the CPCs shall adopt fisheries management measures or national management plans in the Strait of Sicily.
- The management measures or management plans adopted at the national level have to be communicated to the GFCM Secretariat.

## *Specific measures to address illegal, unreported and unregulated fishing activities*

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- The CPCs have to establish a mechanism to ensure that **the vessels authorized to fish for HKE and/or DPS in the SoS shall record all their catches** of these two target species.
- Each CPC have to **designate landing ports** in which exclusively landings and or transshipping of HKE and/or DPS from the SoS may take place.
- **The CPCs cooperate** on the fight against illegal, unreported and unregulated (IUU) fishing activities, **in particular through sharing information and gathering intelligence to fight against IUU fishing activities and organized crime.**

## ***Monitoring, control and surveillance programmes***

- The CPCs, through the GFCM, have to establish or maintain an observation and inspection programme to ensure compliance with the conservation and management measures.
- Such programme may comprise inter alia the following elements:
  - a. High seas inspection;**
  - b. Procedures for an effective investigation** of violation of the management measures and for reporting to the GFCM on the actions taken, including procedures **for exchanging information;**
  - c. Provisions for appropriate action** to be taken when inspections reveal serious violations as well as the **convenient and transparent follow-up of such actions** in order to support the flag state's responsibility within the intended programme;
  - d. Port inspections;**
  - e. Monitoring of landings and catches**, including statistical follow-up for management purposes;
  - f. Specific monitoring programmes**, including boarding and inspection;
  - g. Observer programmes.**

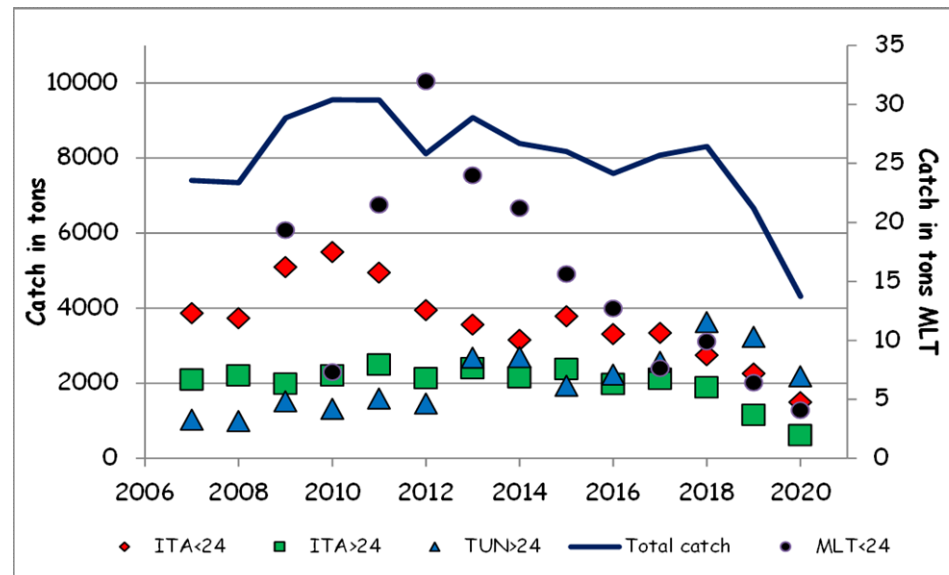
## ***Scientific monitoring, adaptation and revision of the multiannual management plan***

- The CPCs have to ensure **adequate annual scientific monitoring of HKE and of DPS** in the SoS.
- The SAC has to **provide advice on the status of HKE and of DPS** in the SoS. Fishing mortality should be at levels which can produce the MSY at the latest by 2020.
- The SAC has to **assess the biological, economic and social implications of implementing several management scenarios** with the objective of restoring and maintaining the populations of harvested species above levels which can produce the MSY.
- The SAC has to advise on the most appropriate **minimum and/or maximum landing sizes for elasmobranchs** species affected by the fisheries exploiting of HKE and of DPS in the SoS.
- The SAC has to advise on the most appropriate technical measures to **improve the selectivity of bottom trawlers targeting HKE and/or DPS** stocks.

## Scientific monitoring, adaptation and revision of the multiannual management plan

- According to the WGSAD 2022 the DPS stock is in overfishing and overexploited
- The advice is reduce fishing mortality
- If the stock biomass is rebuild, an increase of catch is expected in short time

Years	2018	2019	2020
Catch (tons)	8300	6900	4300
SSB (in tons)	12687	10043	7578
REC/10 <sup>6</sup>	5.53	4.08	5.14
Fbar	1.33	1.29	0.84
F0.1	0.84-0.93		



- In 2020 the Italian landings amounted to about 2100 tons and the Tunisian ones to about 2200 tons

The estimation of DPS MSY by BSM is about **8200** tons

(from Gancitano et al., 2022)



# Scientific monitoring, adaptation and revision of the multiannual management plan

- According to the WGSAD 2022 the DPS stock is in overfishing and overexploited
- The advice is reduce fishing mortality
- If the stock biomass is rebuild, an increase of catch is expected in long time

HKE SS3	2018	2019	2020
$F_{MSY}$	0.29	//	//
$SSB_{MSY}$	7021	//	//
$F_{current}$	0.48	0.5	0.36
$F_{current}/F_{MSY}$	1.66	1.72	1.24
Catch (tonnes)	<b>2900</b>	<b>2500</b>	<b>2100</b>
SSB (tonnes)	4397	4744	4885
$SSB/SSB_{MSY}$	0.63	0.68	0.7

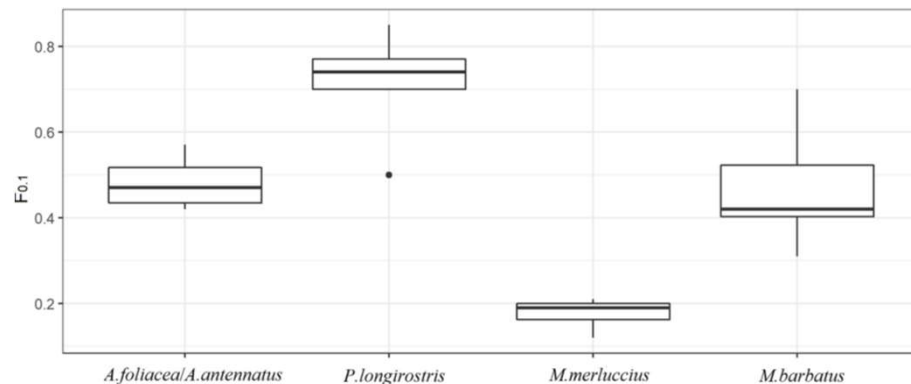
Fleet	%_landing (2020)
Italian trawlers	27.08
Maltese trawlers	0.4
Tunisian trawlers	64.03
Italian fixed nets	7.06
Tunisian passive gears	1.43

The best estimation of HKE MSY by SS3 is about **3400 ±180** tons

(from Falsone et al., 2022)

# Some critical points to be deepened

The difficulties to manage two very different species by fishing effort....

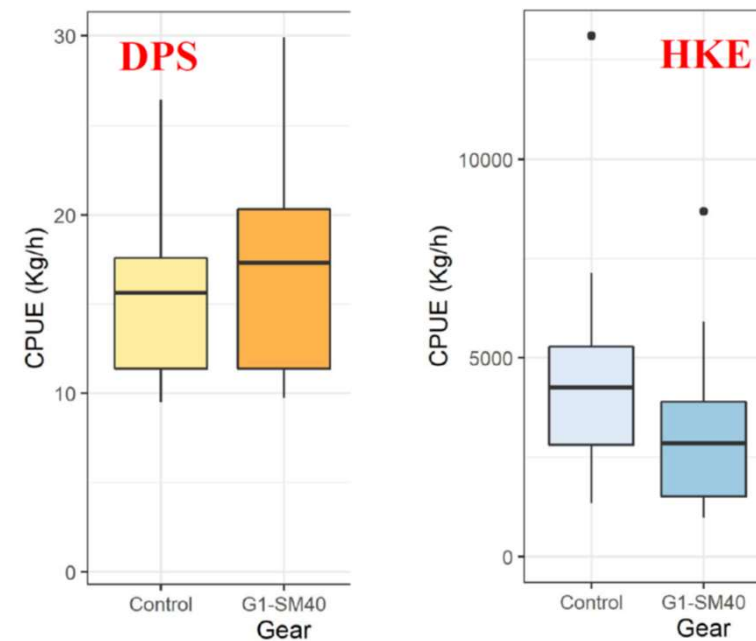


Box plots showing the distribution of F<sub>0.1</sub>, as a precautionary proxy of FMSY, for the main target species of the Mediterranean bottom trawling.

With the current exploitation pattern, achieving the FMSY of hake implies a strong loss of a sustainable yield of red mullet, deep-water rose shrimp, and deep water red shrimps.

Different solutions need to be explored

- Catch quotas;
- More selective gears;
- Spatio/temporal closures;
- ...and combinations of the above measures

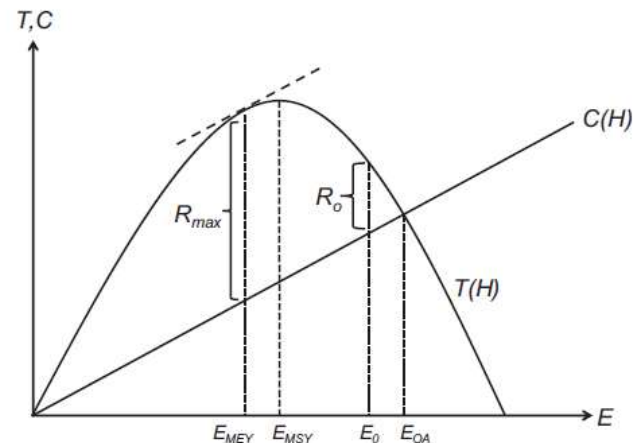


# Some critical points to be deepened

The complexity due to be resources shared amongst countries with different socio-economic context

During the three years of study (2015-2017), the economic profits of the DPS & HKE bottom trawl fishery of Tunisian fleet operating in the Strait of Sicily increased

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



(From Nielsen et al., 2014)

Estimated first-sale average price (TND/kg) per type of market (N.M: National market/E.M: Export market) of target species in Northern Tunisia (2015 – 2017).

	2015		2016		2017	
	N.M	E.M	N.M	E.M	N.M	E.M
<i>Parapenaeus longirostris</i>	8.98	28.8	8.33	35.11	11.11	43.83
<i>Merluccius merluccius</i>	7.14	-	8.11	-	9.42	-

(From Ben Arfa et al., 2022)

When a stock is exploited for the international market under open access by fleets with very different total social costs and fishing activities for fleet with higher costs became be unsustainable

# Conclusions

- The current management for bottom trawling fisheries in the SoS is based **on control of fishing effort integrated with technical measures, including spatial and temporal closures.**
- However, **neither quota of fishing effort nor quota of catch by fleet** are fixed by the whole stock or by countries and the sections of the MAP related to the **monitoring, control and surveillance requires further improvement.**
- The MAP foresees that only a limited number of trawlers be authorized to fish in the SoS targeting DPS and HKE. These vessels are identified through an **ad hoc GFCM list of authorized vessels** defined on the basis of indications received by concerned countries.
- In spite to the list, **the occurrence of not authorized trawlers operating in the SoS is quite frequent**, thus resulting in a reduction of effectiveness of the management measures in the MAP and in increase of IUU fisheries in the area.

## *Main achievements of the MAP*

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- **Stakeholder involvement** in defining management objectives and overall approach;
- The results of **scientific studies** were taken as baseline **for setting management measures**;
- Both technical and spatio-temporal control measures were adopted to reduce fishing mortality and the impact of trawling on the ecosystems (Protection of Essential Fish Habitat in terms of nurseries of HKE and DPS, Adoption of a summer trawling ban in sensitive area to protect juveniles of shallow water species and selachians);

## *Main achievements of the MAP*

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- **Further scientific studies** are in progress to monitor and evaluate the management measures performance (the extension of the MEDITS off the Tunisian coasts);
- The consolidated international scientific cooperation (**FAO MedSudMed programme**) was and will continue to be the key factor for initiating the entire process that lead to the development of the MAP and for addressing some of the aspects that requires further improvement;
- The identification of **Nurseries of HKE and DPS along the African side** to protect critical habitats also in the southern sector of the Strait of Sicily;

## *Areas to be further improved*

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- **A more realistic target for fisheries management** - One of the most controversial aspects of the MAP is the indication of achievement for both DPS and HKE of MSY. This objective is not realistic due to the very different level of fishing mortalities corresponding to the MSY of the two species
- **The real political willing of the CPCs to reach the MAP objectives** - the management objectives are formally based on i) precautionary approach, ii) MSY, iii) ecosystem based and responsible fisheries, but the socio-economic state of different countries involved in fisheries suggests different true objectives.

## *Areas to be further improved*

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- **Sharing of information** – Additional effort should be devoted to enhance sharing of information and results both of scientific studies and of monitoring activities among all stakeholders at national and regional level.
- **Socio-economic assessment** - A main aspect that requires further improvement is expanding the assessment studies to socio-economic implications of management measures adopted.
- **The poor enforcement of management measure and control systems** – The international joint inspections were carried out in an experimental way between 2018 and 2019, but to date routine controls have not been implemented.



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