THE ROLE OF GFCM IN REGIONAL FISHERIES MANAGEMENT

John F. CADDY
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The terms of reference of the General Fisheries Commission for the Mediterranean

- Mediterranean countries have not declared Exclusive Economic Zones – an international mechanism for High Seas management is important.
- The Mediterranean is made up of several linked basins with different environmental conditions, harvested by a variety of gears, from 22 countries with different political and economic conditions and languages.
- This adds to the problem of arriving at a common fisheries framework.
- Limited finances and skilled manpower in many member countries reduces their contribution to GFCM through attendance at meetings and active participation in initiatives.
- Regulations introduced domestically by the EC will need to be also proposed in the GFCM if they are also to be adopted by non-EC countries.
The current structure of committees and working groups of GFCM, together with the regional projects organized by FAO.
A selection of countries showing numbers of attendees at GFCM meetings from 2001-2008, and the number of national focal points for SAC subcommittees.

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<th>COUNTRY</th>
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ARE GFCM OUTPUTS IMPROVING?

• A significant number of Subsidiary Bodies has not yet led to a high volume of technical analyses; In some cases technical procedures are being clarified;

• However, GFCM documents and data are readily available on the GFCM website (www.gfcm.org), and a number of management recommendations have been made, to some extent from precautionary considerations.

• A limited number of single-species assessments have been performed for the 51 important species in the 30 statistical areas of GFCM. Doing so annually for all important species would be largely impossible.

• Single species assessments for all species are not vital for effort control rather than quotas. At least 3-5/area might be aimed for annually.

• Assessments can be simpler, based on monitoring trawl and catch surveys, and trend analysis.

• Since most demersal resources are trawled together, it is vitally important to develop multi-species assessment procedures for trawl fisheries.
Numbers of single-species assessments carried out in 14 GFCM areas (data from De Natale 2009).

<table>
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<tr>
<th>GFCM Statistical area</th>
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Statistical areas of the Mediterranean showing the lack of assessment work in the Eastern Mediterranean – after Farrugio 2010. *(The red color for the Black Sea is wrong: most species there were assessed in the 1970’s-80’s).*
Statistics gathering and analysis is the key to management for effort control. Work so far has been mainly aimed at effort calibration. Work should be speeded up in applying procedures needed for effort control!
THE NEED FOR MULTIDISCIPLINARY DECISION-MAKING

• Rather than subdividing the work of GFCM into disciplines each with its subsidiary body, resolving multidisciplinary issues requires cooperative inputs from different specialists.
• Top-down control of working group priorities is also needed by the SAC and the Commission itself.
• Should working groups meet cooperatively? Do all standing bodies need to meet annually?
METHODS OF DATA ANALYSIS

• Simple methods using size frequency data, fishing effort trends, scientific surveys, and commercial catch rates, are a sufficient basis for precautionary management by SAC;
• A Subcommittee, the SCMEE is to monitor environmental change, especially in semi-enclosed areas such as the Adriatic;
• This Subcommittee should also propose closures of specific areas to towed gear, and regulate discarding;
• Its role in monitoring environmental trends could be accomplished through partnership with organizations specialized in this subject matter, such as UNEP.
ECONOMICS AND SOCIAL SCIENCES

• The SCESS (Subcommittee on Economics and Social Sciences), aims to analyse a wide range of socio-economic and market issues;

• A short supply of expertise, and economic data in many countries poses a problem;

• Nonetheless, a bioeconomic approach is called for, rather than just stock assessment.

• The main objective of fisheries, consistent with conservation measures, is to realize a maximum profit and not just the maximum landed weight;

• Hence close cooperation between the SCSA and SCESS is recommended.
MARKET DEMAND

• Small fish are prominent on Mediterranean markets. For demersal fish, this is due to the original low productivity of this Sea: further accentuated by heavy exploitation: (most demersal fishes are fully or overexploited).

• Market demand for fresh fish has always been high, with high prices paid for smaller fish. Under a long culinary tradition, dishes are often served with several small fish on a plate.

• There is a close linkage between fishers, markets and customer demand, including the need to serve tourists traditional dishes in one of the world’s prime tourist areas.
THE AQUACULTURE SUBCOMMITTEE, CAQ

- GFCM differs from other Commissions in tackling aquaculture;

- Given the spatial demands of the tourism industry for sports fishing, scuba diving, harbors, as well as for aquaculture, ICAM and GIS are necessary tools in allocating maritime space;

- Closing areas to fishing, seasonal or permanent, becomes a major mechanism for multispecies management. Decision-making by local communities which have ‘territorial user rights’ (TURFs) allows them to share management of the small-scale fishery;
An early study identified a common life history for demersals; they often start life in near shore nurseries, and migrate offshore to spawn:
THE FISHERY REFUGIUM

• The preceding diagram supports an idea for a new approach to fisheries management called the ‘refugium paradigm’.
• Note that in the 1970’s-80’s, despite heavy inshore trawling, recruitment to the juvenile bottom fish continued without effort control or quotas.
• Mediterranean shelves (atypical of the North Atlantic) have few large trawlable areas such as the Gulf of Lyons and Adriatic.
• Much of the Mediterranean shelf is rocky, and largely untrawlable without extensive modifications to towed gear (unfortunately implemented!).
• The ‘refugium paradigm’ proposes that the few fish that survive to mature after the inshore trawl fishery, are concentrated in these rocky areas, and should be protected from intensive exploitation.
• (A recent recommendation has proposed applying the refugium concept in deeper water canyons near the Gulf of Lyons).
THE FISHERY REFUGIUM

Illustrated for the Gulf of Lions shelf: -
Trawling areas on the shelf (green), are adjacent to adult ‘refugia’ on rocky areas of the continental slope (square) (from Farrugio 2010).
– note that for most of the Mediterranean, the shelf is much narrower than here, with more rocky areas.
CONSERVING THE SPAWNING STOCKS

• Under the refugium concept, aimed at conserving adult spawners, banning modifications to towed gear for use over rocky bottom is a useful strategy.
• The priority for management action is closure of some untrawlable areas to bottom gear.
• This also saves algal growths inshore, protecting juvenile fish in nursery areas.
• (A degree of control of smaller fishing boats using trammel nets which fish rocky areas for larger fish is also called for).
For almost a century, fishing fleets trawled for shrimp off Spain's Mediterranean coast. But in the 1960s, they started to pursue shrimp farther offshore into rugged canyons as deep as 800 metres. 

**Intensive bottom trawling leaves the seafloor looking like a ploughed field.**

Deep-sea trawling makes marine mountainsides look more like ploughed fields, changing the habitat of deep-sea creatures according to work published in *Nature* in September.
Impact of removing heavy bottom chains from trawls

• Trawling destroys cover which juvenile fish need for protection from predation, & damages biodiversity.

• Trawling should be limited to flat bottom areas without dense epifauna/flora.

• An illustration (right) of how prohibiting the use of chains on the trawl affected fishing over rocky areas (=BLACK).

• (from Bellman et al. 2005).
PROTECTING JUVENILE FISHES

• Protecting juveniles can best be accomplished by reducing seasonal effort over nursery areas, and prohibiting discarding of commercial species (dead once on deck).

• Studies on the survival of juvenile fishes through cod end meshes in the North Atlantic have shown that physiological stress occurs due to exhaustion of glycogen reserves;

• Predation after escapement through the cod end results in higher natural mortality rates than normally assumed;

• Simulations taking higher mortalities of juveniles into account, show that the advantages of increasing the mesh size of trawls are much less than previously assumed.
A SPATIALLY-EXPLICIT MANAGEMENT CONTEXT
A spatial framework for management gives priority to co-existence between aquaculture, tourism, and inshore fisheries.
GFCM AND THE BLACK SEA?

- Nutrient discharges from the Danube/Dnieper reached excessive levels in the 1990’s. High inputs of fertilizers and effluents came from the large catchment area of the Black Sea and caused eutrophication.

- The jelly predator *Mnemiopsis* entered the Black Sea in ballast tanks of shipping from the US east coast. Within a few years, it was present in millions of tons, consuming zooplankton, fish eggs and juvenile fishes.

- This led to serious declines in small pelagic fishes in 1990-92.

- After a short life history without predators, *Mnemiopsis* sank to the shelf and decomposed, leading to oxygen deficiencies.

- Due to poor water quality, seasonal migrations into the Black Sea of mackerel, bonito and blue fish from the Mediterranean declined.
CONCLUSIONS (BLACK SEA)

Whether GFCM should take over management of Black Sea resources is debatable; especially since management of resources in the Mediterranean requires full attention of the Commission, and several coastal countries are not members of GFCM.

Setting up an autonomous body seems appropriate, given that environmental issues are very important, and because several important coastal states are not members of GFCM.

This hypothetical independent body may however be considered a second Panel of GFCM, and should participate jointly with GFCM in cooperative programmes.
CONCLUSIONS (1)

• 1) GFCM is an essential mechanism for cooperative management of high seas fisheries given the absence of EEZ declarations in much of the Mediterranean.

• 2) GFCM has many subcommittees, each with specialized working groups. These should cooperate on multidisciplinary issues, but it is not clear they always do so.

• 3) Attendance at these meetings is sparse by smaller countries. Reducing the number of meetings or their frequency, or combining them, will save funds, as will the use of electronic communications.
CONCLUSIONS (I CONT’D)

• The SCSA has only agreed on relatively few fish stock assessments, and until 2011, none in the Eastern Mediterranean.

• The STECF body of the EC has been supplementing effort on this task, and this duplication of effort between GFCM and STECF needs discussing.

• If fishery management is by effort control, single species assessments are not so vital as where management is by quotas. A statistical approach to analysis of trends in abundance is suggested.
CONCLUSIONS (2)

• Management measures should use indicators of abundance, and set up limit reference points. When abundance levels fall below an accepted minimum, or if fishing effort exceeds some established maximum, effort levels should be reduced. GFCM has made some progress with this.

• Assisting some countries locally in implementing recommendations will increase the effectiveness of GFCM.

• Cooperation from external bodies in implementing GFCM recommendations seems advisable for aquaculture, bio-economics, and environmental issues:

• The ambitious programmes of GFCM cannot all be achieved with the current level of funding.
CONCLUSIONS (3)

• Closure of inshore areas to fishing, seasonal or permanent, must be integrated into local decision-making.

• The aquaculture committee, CAQ, needs to cooperate with local communities having ‘territorial user rights’ (TURFs).

• Further increases in mesh size should be viewed with caution; indirect mortalities by trawling can be substantial. Protecting juveniles (and the essential epifauna/flora of nursery areas) could be achieved by seasonal closures;

• There is a close relationship between the local fishery and the high value tourist industry. This pays high prices for small fresh fish and invertebrates; the frozen, filleted product is not highly appreciated.
CONCLUSIONS (4)

• The ‘refugium approach’ is recommended to ensure that spawning biomass is not excessively reduced by fishing.
• This involves closing areas of shelf edge and slope to trawling where rocky bottoms are found, to protect large, mature fish which are important for stock recruitment.
• To reduce trawling on rocky refugia, a ban on modifications to allow trawls to work over rough and vegetated bottom is recommended.
• To regulate fishery closures, an obligatory black box should be installed on trawlers to allow satellite tracking.
• Appropriate penalties for ignoring area closures are needed.
CONCLUSIONS (5)

- Fisheries management depends critically on diagnosis of the state of stocks and habitats.
- The application of recommendations from SAC and the Commission is however essential to proper management;
- This latter function depends on the actions of member countries in implementing the recommendations of GFCM.
THANK YOU