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Scientific Technical Economic Committee of Fisheries Opinion on

Evaluation of Plans for Protection of Marine Living Resources on the Italian Mainland, in Sicily and Sardinia

Delivered at Plenary Meeting of STECF

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This report does not necessarily reflect the view of the European Commission and in no way anticipates the Commission's future policy in this area

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1 BACKGROUND

A meeting of the STECF-SGBRE sub-group (SGBRE 06-01) took place in Brussels from 27-31 March 2006 to examine numerous management plans for the protection of marine living resources in Italy and the autonomous regions of Sardinia and Sicily. The objectives as given by the Commission were as follows:

Scientists shall provide advice on the basis of both their expertise, including previous STECF works, and of scientific information attached to the plans for the protection of the resources and shall, in particular, evaluate the reliability of the plans in terms of:

- diagnosis upon which the plan is based (e.g. status of the resources and evolution of main fishery indexes);
- prognosis and expected results (benchmarks, appropriateness of the methodology to evaluate the objectives, reduction in fishing capacity, etc.)
- -congruence of the plan both with the targets (e.g. timeframe, appropriateness of management measures with conservation objectives, effectiveness of proposed measures, etc.) and with ongoing fishing practices as well as with already enforced management measures (e.g. the likely outcomes of the plan can be voided by current fishing practices? etc.)
- added value to ensure higher conservation of the exploited resources targeted by the plan in order to achieve higher long-term yields and better economic performances of the fleets involved. Since the various Italian Administrations (national Ministry, Region of Sicily and Region of Sardinia) have implemented different plans for the protection of the resources and have delivered different type of scientific analysis, STECF is requested to differentiate between Italy mainland, Sicily and Sardinia when delivering its advice.

STECF was requested by the Commission to examine the sub-group's analysis and deliver an opinion on the usefulness of the plans in protecting marine resources.

1.1 Context

According to Community rules, a plan for the protection of marine living resources must include additional measures to temporary fishing bans, such as permanent reduction of fishing capacity or by adopting supplementary technical measures. Those are designed to further reduce fishing mortality over and beyond what is already enforced at national or Community level. The plan must be notified to the Commission which submits it to the opinion of the Scientific, Technical and Economic Committee (STECF) that must evaluate the scientific basis and likely effectiveness of the plan in terms of pursued conservation results. It is responsibility of a Member State to provide adequate scientific justifications to support the execution of temporary fishing bans under the requirements of the FIFG Regulation.

Both Sicily and Sardinia are Regions with autonomous Statute and they can rule on fishery matters with the exception of the fleet policy which is regulated at national level. The annual temporary fishing ban is on of the management measures regularly undertaken in Italy, including also Sicily and Sardinia, during the last 18 years although it has been differently modulated with respect to timing and fisheries in the various Italian seas.

1.2 Terms of Reference to the SGBRE Sub-group

1. to evaluate whether each plan for the protection of the resources is based on information and sound scientific analysis that allow to establish measurable objectives for each plan as well as to determine a diagnosis of the state of the stocks and of fisheries targeted by each plan;
2. to evaluate whether the scientific analysis allows to conclude that the exploited resources targeted by the plan have been fishing at sustainable or unsustainable levels and if the changes in fishing mortality, prior and after the execution of the plan, will allow higher yields in the long term as well as a reduced biological risk to the fish stocks;
3. To evaluate whether the plan is able to adjust fishing on the target stocks and main associated species in order to achieve greater caches larger and more stable stocks of fish and more profitable fisheries.
4. to evaluate whether and why other type of analysis could/should have been taken into consideration to set up the basis and to evaluate the appropriateness of the plans;
5. to evaluate whether the scientific basis of the plan has taken stock of and full exploited the monitoring data gathered through the Community data collection programme (Council Regulation (EC) 1543/2000).
6. to advice whether and why there may be scientific analysis in the fisheries science toolbox which are not valid to assess the state of exploited resources in the Mediterranean;
7. to evaluate whether the scientific analysis ensures a full coverage of geographical stocks and fisheries involved in the plan for the protection of the resources and which areas, fisheries and stocks are not covered;
8. to evaluate whether the measures implemented in the legislative acts match with the alternative management measures identified and justified in the various scientific reports. Identify also if an uneven implementation of the temporary fishing ban between areas is justified on the basis of the different conditions of exploited resources targeted by the plan;
9. to evaluate whether and how much the temporary fishing bans and complementary measures, if any, have been contributing to reduce the fishing mortality and the fishing effort as well as to improve sustainable exploitation of targeted resources;
10. To evaluate whether the implemented closed areas, in terms of location and dimensions, are relevant for the concerned stocks;
11. to evaluate whether the closed areas implemented in conjunction with the plan affect and how the operations of fleets involved in the plans.
12. to evaluate whether between year changes in the execution of the plan are scientifically justified and if they may negatively influence the effectiveness of the plan.
13. to evaluate whether the expected results may be voided by alternating temporary fishing bans between adjacent maritime departments taking into consideration the mobility of the fleets, the location of operating fishing grounds and uneven distribution of exploited resources between territorial and international waters;
14. To evaluate whether in conjunction with the plan there has been, for the fleet areas covered by the plan, a permanent reduction of the fishing capacity with respect to the period before the plan;
15. To evaluate whether and why the absence of a recurrent temporary fishing ban concerned fleets may further deteriorate the state of exploited resources

1.3 Participants

1.3.1 STECF members

Max Cardinale (chairman)
Antonio di Natale

Giandomenico Ardizzone

1.3.2 Invited Experts

Argyris Kallianiotis
Jordi Lleonart

1.3.3 European Commission

Franco Biagi (DG_FISH)
Hendrik Doerner (JRC, secretary)
Iain Shepherd (JRC, secretary)

2 SUMMARY OF CLOSED AREAS

Table 2-1 summary of closed areas

	areas	mandatory	period	week-end + holydays	banned area extension (4 ml or 60 m)	voluntary	period
ITALY mainland 2004							
bottom trawl fishery + pelagic trawl fishery (excluding oceanic trawlers)	North-Central Adriatic (Trieste to Monfalcone)	Y	August 2 to September 5	no fishery	July 5 to October 10	N	
	South Adriatic + Ionian Sea (Molfetta to Crotone)	Y	September 9 to October 10	no fishery	July 5 to October 10	N	
	Tyrrhenian Sea + Ligurian Sea (Reggio Calabria to Imperia)	Y		no fishery		Y	35 days between July 5 to October 10
all other fisheries (excluding hydraulic dredges, recreational fishery and "pescaturismo")	Adriatic Sea + Ionian Sea (Trieste to Crotone)	N				Y	July 5 to August 1
all passive gears (excluding recreational fishery and "pescaturismo")							
ITALY mainland 2005							
bottom trawl fishery + pelagic trawl fishery (excluding oceanic trawlers)	North Adriatic (Trieste to Ancona)	Y	August 1 to 30 (3)	no fishery	September 14 to October 31	N	
	Central Adriatic (S.Benedetto del Tronto to Manfredonia)		two periods of 15 days: August 13 to 27 and September 17 to October 1 (3)	no fishery	September 14 to October 31	N	
	South Adriatic + Ionian Sea		two periods of 15 days:	no fishery	September 14 to	N	

	areas	mandatory	period	week-end + holydays	banned area extension (4 ml or 60 m)	voluntary	period
	(Molfetta to Crotone)		September 3 to 19 and September 30 to October 14 (3)		October 31		
	Tyrrhenian Sea + Ligurian Sea (Reggio Calabria to Imperia)	N		no fishery		Y	September 12 to October 11 (1)
all other fisheries (excluding hydraulic dredges, recreational fishery and "pescaturismo")							
all passive gears (excluding recreational fishery and "pescaturismo")							
Sicily 2004							
All fishing vessels registerd in Sicily (excluding oceanic trawlers)(4)	Maritime Compartments of Porto Empedocle, Mazara del Vallo and Trapani	Y (4)	August 10 to September 9	no fishery except for "pesca-turismo"	N	N	
	Maritime Compartments of Palermo and Milazzo	Y (4)	August 25 to September 23	no fishery except for "pesca-turismo"	N	N	
	All the other Maritime Compartments	Y (4)	September 10 to October 9	no fishery except for "pesca-turismo"	N	N	
Sicily 2005							
All fishing vessels registerd in Sicily (excluding oceanic trawlers)(4)	All Maritime Compartments (5)	Y	30 days continuously or even in two periods between August 5 to October 30.		N	Y (6)	
	Trawlers fishing in the Straits of Sicily	Y	30 days continuously or even in two periods between August 5 to November 10.		N	Y (6)	
Purse seiners	All Maritime Compartments	Y	30 days continuously between August 5 to November 30.		N	Y (6)	
Sicily 2006							
All fishing vessels registerd in Sicily	All Maritime Compartments (7)	Y	45 days continuously between	Y (12)	N	N	

	areas	mandatory	period	week-end + holydays	banned area extension (4 ml or 60 m)	voluntary	period
(excluding oceanic trawlers)(4)			September 15 to October 30				
	All Maritime Compartments (8)	Y	45 days continuously between April 1 to May 15	Y	N	N	
	All Maritime Compartments (9)	Y	45 days continuously between October 15 to November 29	Y	N	N	
Purse seiners	All Maritime Compartments (10)	Y	45 days continuously between September 15 to October 30 (11)		N	N	
Sardinia 2003							
Set net fishery and small bottom trawlers <15 grt	All Maritime Compartments	Y (13) (14) (17)	March 1 to April 14			Y (15)	March 1 to April 14
purse-seiners for small pelagic species and artisanal long-liners targeting swordfish	All Maritime Compartments	N (17)				Y	45 days continuously
bottom and pelagic trawlers between 15 to 30 GRT	All Maritime Compartments	Y (17)	September 12 to October 27			Y (16)	March 1 to April 14 or September 12 to October 27
bottom and pelagic trawlers (all, except for the previous categories)		Y	September 12 to October 27				
Sardinia 2004							
Set net fishery and small bottom trawlers <15 grt	All Maritime Compartments	Y (14)	February 21 to May 5		February 21 to May 5 (18)		
purse-seiners for small pelagic species and artisanal long-liners targeting swordfish	All Maritime Compartments					Y	February 21 to May 5
bottom and pelagic trawlers between 15 to 30 GRT	All Maritime Compartments	N			February 21 to May 5 (18)	Y (16)	February 21 to May 5 or September 15 to October 14
bottom and pelagic trawlers (all, except for the previous categories)	All Maritime Compartments	Y	September 15 to October 14		February 21 to May 5 (18)	Y (16)	

(1) the ban was decided on single Maritime Compartment basis, only after the agreement of at least 60% of ship owners;

(2) the ban was decided on single Maritime Compartment basis, only after the agreement of at least 70% of ship owners;
(3) a reduction of the fishing effort (maximun 32 days of fishing activity) was applied in the period between the end of the closure to December 31.
(4) voluntary for the vessels having a licence for bottom or pelagic trawl chosing to continue the foishery with another gear during the period of the ban.
(5) excluding trawlers fishing in the Straits of Sicily, purse-seiners and vessels engaged in "pescaturismo";
(6) voluntary for the vessels engaged in "pescaturismo";
(7) limited to bottom or pelagic trawls, excluding the "Mediterranean" licence;
(8) limited to bottom static fisheries (fixed gears, lines, longlines and harpoon), excluding the "Mediterranean" licence
(9) limited to surface fisheries (gillnets, purse-seines, lines, longlines and harpoon), excluding the "Mediterranean" licence and some recreational fisheries;
(10) limited to bottom trawlers having a "Mediterranean" licence
(11) the ban is valid only for Italian national waters but these vessels can fish outside, according to a specific Management Plan to be established;
(12) excluding licences for "Coastal local fishery" when they have to recover days of adverse meteorological conditions
(13) mandatory for the small trawlers <15 GRT;
(14) excluding small bottom trawlers <15 GRT registered in Cagliari allowed to continue the fishery between C. Spartivento to C. Carbonara;
(15) voluntary for small bottom trawlers between 15 to 30 GRT;
(16) bottom trawlers having also a longline licence can chose to continue their activity even during the closure when fishing with longline outside the national waters; vessels can chose between the closure in spring or in fall;
(17) several fishing activities are excluded from the closure: scuba diving professional fishery, red coral fishery, most of the recreational fishery activities, sport game fishery and scientific surveys.
(18) The prohibition to carry on trawl fishery within 5 miles from the coast or 100 m depth is enforced in some areas during the ban in spring, to protect coastal resources.

NOTE: in addition to time-area closures for fleet segments, several closed areas have been established so far in the Italian Seas, including the Sicilian area; the details of these areas are included in the plans or in other specific Decrees.

3 STECF CONSIDERATIONS AND RECOMMENDATIONS ON ALL AREAS

STECF has reviewed the report of SGBRE and makes the following observations and recommendations.

1. STECF recognizes that, in spite of the implementation of different management measures in the last 18 years, several important marine living resources (i.e. hake, red mullet, deepwater rose shrimp) around Italian coasts (GSAs 9, 10, 11, 16, 17, 18, 19) are overexploited. This is documented in a number of places : SEC 2002 [1374] on Mediterranean shared stocks; SEC 2004 [772] on Mediterranean fleets; SEC 2005 [266] on the state of the stocks; GFCM-SAC reports; and scientific documents attached to the plans and presented to the STECF Sub-group).
2. STECF considers that the measures currently included in the Italian plans are among those recommended as candidate measures by the scientific community.
3. STECF notes that in accordance with EC 2792/1999, plans for the protection of marine living resources must include additional and supplementary technical

measures designed to further reduce fishing mortality over and beyond what is already enforced at national or Community level.

4. STECF notes that the information and analyses on the effects of the plans presented by the Sicilian and Sardinian authorities was comprehensive, whereas that presented for the Itallian mainland was incomplete. Specifically, information by species and area was incomplete, trends in stocks were described in terms of abundance only and analyses on the current levels of exploitation were inadequate.
5. STECF considers that the plans presented by the Italian authorities (Italian mainland, Sardinia and Sicily) have no clear measurable objectives, in terms of targets to achieve (i.e. level of F and SSB, mean size/age of the stock, biodiversity, etc) as well as a time frame for achieving (see guiding principle established by the Commission in EC 2792/1999). The objectives of the plans should be clearly defined and a monitoring programme be put in place to assess the affect of the closure against agreed performance measures.
6. STECF considers that the expected positive effect of the management measures, included in the plan may have been compromised by factors such as increase in the fishing capacity of the fleet, increase in gear catchability, technical creeping, inadequacy in the design and implementation of the management measures included in the plan (i.e. extension and period of the fishing ban, extension and location of the closed areas), deterioration of essential fish habitats, low selectivity of the fishing gears, etc. Also, it has not been possible to disentangle the effects of different factors and management actions on the fishing mortality of the exploited stocks.
7. STECF advises that national management measures on fisheries exploiting stocks straddling international management areas may be inadequate to achieve conservation objectives.
8. STECF considers that the status of essential fish habitats (EFH) and sensitive habitats (SH) is likely to deteriorate if the management measures currently implemented are discontinued. However, STECF was unable to assess whether the abandonment of the current measures will have any deleterious effect on stock status.
9. STECF considers that protection plans are insufficient to safeguard long-term sustainability of the exploited stocks. STECF considers that for the season fishing ban to be effective, it should include the following elements:

    - The ban should be compulsorily applied to all relevant fishing methods and gears that catch the species the ban is designed to protect
    - The ban should be for a continuous period when all fishing by relevant fishing methods and gears is prohibited
    - The ban should be extended to large areas at least to the GSA level. This is to minimise the transfer of effort to adjacent areas and especially to prevent diversion of effort into international waters outside 12 miles which could negate the potential benefits of the ban. The design in terms of period of closure must be revisited and planned to match the period of recruitment of the target species included in the plan.

10. STECF recommends that the present location and extension of closed areas should be reviewed to ensure that they encompass those areas where SH and EFH for the most important marine living resources are persistent in time.
11. STECF recommends effective management measures for the protection of the marine resources should not only include a compulsory fishing ban which, provided that it substantially reduces the annaul total number of days at sea of the fleet but should be supplemented with the following elements:

    - a progressive reduction of the effective fishing capacity of the fleet

- the establishment of permanent closed areas to protect SH and EFH. The extent of such areas should be sufficiently large to ensure that the desired effect is achieved.
- an increase in selectivity of the gears in order to decrease F on the juveniles, reduce discards and reduce the impact on benthic communities

12. STECF recommends that in future, indicators of the status of the main target stocks at the time when the plan commences should be provided. The effectiveness of the plans over time should be then evaluated with respect to such indicators.
13. STECF also recommends that in future the cost effectiveness of different management options are evaluated to identify which option will result in the highest possible biological impact for a given amount of subsidy. Section 2.1 in this report presents a general discussion on this topic.

ANNEX

REPORT OF AD-HOC WORKING GROUP

1 BACKGROUND

1.1 Aids for the temporary cessation of fishing activities

Council Regulation (EC) 2792/1999 (OJ L 337 of 30.12.1999, p10), hereby briefly named as FIFG Regulation, establishes that temporary fishing bans for conservation purposes may be funded either with structural funds (Article 16.1c of FIFG) or with national funds (Article 12.6 of FIFG) provided that they fulfill the requirements therein as well as in the Guidelines for the examination of State aid to fisheries and aquaculture (OJ UE C 229 of 14.9.2004, p. 5). In the case of Article 12.6, and according to paragraph 4.3.2 of the abovementioned Guidelines for the examination of State aid, a temporary fishing ban shall be part of an effective plan for the protection of aquatic resources that must contain precise and measurable objectives together with a clear multiannual time frame. A temporary fishing ban alone cannot be considered as a plan for the protection of the resources that, instead, must include additional measures designed to further reduce fishing mortality such as permanent reduction of fishing capacity or by adopting supplementary technical measures, over and beyond what is already enforced at national or Community level. The rational behind these requirements is that the plan shall be based on genuine conservation needs

and not be used as an excuse to subsidise the fishing fleet, with the consequent high risk of eliminating the expected conservation results as well as to delay the implementation of other conservation management measures. In fact, the Commission has the obligation to scrutinise whether possible funding to private enterprises with national public funds complies with Community rules to avoid distortion of competition. With respect to the funding of temporary fishing bans, it is requested, in particular, that an effective plan for the protection of the exploited resources be established. The plan must be notified to the Commission which submits it to the opinion of the Scientific, Technical and Economic Committee (STECF) that must evaluate the scientific basis and likely effectiveness of the plan in terms of pursued conservation results. It is responsibility of a Member States to provide adequate scientific justifications to support the execution of temporary fishing bans under the requirements of the FIFG Regulation.

1.2 Overview of temporary cessations of fishing activities in Italy

Both Sicily and Sardinia are Regions with autonomous Statute and they can rule on fishery matters with the exception of the fleet policy which is regulated at national level. The annual temporary fishing ban is a management measures regularly undertaken in Italy, including also Sicily and Sardinia, during the last 15-18 years although it has been differently modulated with respect to timing and fisheries in the various Italian seas. The requirements for a temporary fishing ban to be compatible with the State aids discipline have been changing along the time and they are currently much stricter and clearly identified than in the past. Italy has presented a triennial plan concerning certain fisheries operating from the continental mainland for the period 2004 and 2006; temporary fishing bans have been undertaken both in 2004 and 2005. Sicily has undertaken a temporary fishing ban for the whole fleet both in 2004 and 2005. Sardinia has not undertaken any temporary fishing ban in 2005.

2 OBJECTIVES OF THE MEETING

Scientists shall provide advice on the basis of both their expertise, including previous STECF works, and of scientific information attached to the plans for the protection of the resources and shall, in particular, evaluate the reliability of the plans in terms of:

1. diagnosis upon which the plan is based (e.g. status of the resources and evolution of main fishery indexes);
2. prognosis and expected results (benchmarks, appropriateness of the methodology to evaluate the objectives, reduction in fishing capacity, etc.)
3. -congruence of the plan both with the targets (e.g. timeframe, appropriateness of management measures with conservation objectives, effectiveness of proposed measures, etc.) and with ongoing fishing practices as well as with already enforced management measures (e.g. the likely outcomes of the plan can be voided by current fishing practices? etc.)
4. added value to ensure higher conservation of the exploited resources targeted by the plan in order to achieve higher long-term yields and better economic performances of the fleets involved. Since the various Italian Administrations (national Ministry, Region of Sicily and Region of Sardinia) have implemented different plans for the protection of the resources and have delivered different type of scientific analysis, STECF is requested to differentiate between Italy mainland, Sicily and Sardinia when delivering its advice.

3 ANSWER TO THE TERMS OF REFERENCES

3.1 Applicability of plan

to evaluate whether each plan for the protection of the resources is based on information and sound scientific analysis that allow to establish measurable objectives for each plan as well as to determine a diagnosis of the state of the stocks and of fisheries targeted by each plan;

STECF-SGBRE considers that several marine living resources around Italian coasts are clearly overexploited (see reports SEC 2002 (1374) on Mediterranean shared stocks, SEC 2004, (772) on Mediterranean fleets, SEC 2005, (266) on the state of the stocks and GFCM-SAC). STECF-SGBRE considers that in accordance with Community rules, plans for the protection of marine living resources must include additional measures supplementary technical measures designed to further reduce fishing mortality over and beyond what is already enforced at national or Community level. Periodic fishing bans and permanent closed areas are usually implemented and used in order to reduce fishing mortality and protect essential fish habitats or ecosystems, in several areas including the North Atlantic (i.e. Baltic cod, North Sea Plaice) and tropical regions (Australian Great Reef Barrier).

Currently, decommissioning of fishing vessels together with seasonal fishing bans and the institution of areas closed to fisheries have been adopted aiming to further limit and/or reduce fishing mortality in the Italian seas. Seasonal fishing bans have been in place simultaneously at different level in the last 15 years.

Following the STECF document on the Mediterranean shared stocks (SEC 2002 (1374)) and taking into account all the information included in SEC 2005 (266), the diagnosis of the state of some of the most important stocks in the Italian waters can be summarized together with the information included in the different national documents. The STECF recommendations (SEC 2002 (1374) and SEC 2005 (266)) are also included.

3.1.1 ADRIATIC SEA

3.1.1.1 Hake (Merluccius merluccius)

Diagnosis:

Growth overfishing from trawl catches can be easily detected in the last fifty years. Landings do not show a clear trend but from 1993-94 to 2002 a marked decrease can be observed. Also experimental data of CPUE of biomass show a sharp decline. The stock may be unable to sustain the current level of exploitation (SEC 2002 (1374)).

In the documents presented to the Commission by the Italian authorities' only data for the Northern Adriatic are presented, while southern Adriatic and Ionian Sea are missing. The trend in CPUE of abundance from trawl surveys of these last few years (1996-2004) appears to be quite stable. However, it is important to highlight that trend in CPUE in number of individuals (abundance) does not mirror trend in the adult biomass of the stock (SSB) but they generally mirror the temporal dynamic of recruitment.

Recommendations:

Avoid trawl fishery on nursery grounds (the nursery areas are well known and mapped). Control the fishing effort (also through temporal and spatial bans) both for trawlers and fixed gear (SEC 2002 (1374)).

3.1.1.2 Red Mullet (Mullus barbatus)

Diagnosis:

Most of the catches of this stock is taken in late summer or autumn and are based on the newly recruited juveniles. Therefore the fishery is prone to fluctuations correlated to recruitment strength. The assessment based on trawl surveys data pointed out that the total mortality is very high. In southern Adriatic, a Y/R model has been applied to trawl surveys data giving a situation ranging from fully exploited to slightly overexploited (SEC 2002 (1374)).

In the document presented to the Commission by the Italian authorities' only data for the Northern Adriatic are presented, while southern Adriatic and Ionian Sea are missing. The trend in CPUE estimated from trawl surveys (1996-2004) appears to be quite stable. However, it is important to highlight that trend in CPUE in number of individuals (abundance) does not mirror trend in the adult biomass of the stock (SSB) but they generally mirror the temporal dynamic of recruitment.

Recommendations:

The fishing ban within the three miles from the coast should be ensured and enforced. The fishing ban during part of late summer/autumn, as implemented in Italian waters, should be considered in the whole Adriatic (SEC 2002 (1374)).

3.1.1.3 Norway lobster (Nephrops norvegicus)

Diagnosis:

Stock assessment has been conducted only on certain portions of the stock and should be considered with caution. The condition observed was always of full exploitation or overexploitation. Assessment carried out has been able to quantify the amount of effort reduction needed (SEC 2002 (1374)).

In the documents presented to the Commission by the Italian authorities' only data for the Northern Adriatic are presented, while southern Adriatic and Ionian Sea are missing. the trend in CPUE estimated from trawl surveys (1996-2004) seems to be quite stable. However, it is important to highlight that trend in CPUE in number of individuals (abundance) does not mirror trend in the adult biomass of the stock (SSB) but they generally mirror the temporal dynamic of recruitment.

Recommendations:

Fishing regulations based on mesh size should take into account that all Norway lobsters individuals are retained by the current 40 mm mesh size. Assessment carried out is unable to quantify the amount of effort reduction needed. Thus, an effort regulation appears to be a rather more realistic option for this species than an increase in mesh size (SEC 2002 (1374)).

3.1.2 TYRRHENIAN SEA

3.1.2.1 Hake (Merluccius merluccius)

Diagnosis:

Hake is considered to be fully or overexploited along the entire Italian coasts. The current stock spawning biomass (SSB) is considered too low to guarantee the long term sustainability of the stock (SEC 2002 (1374)).

There is no comment on the present situation of this species in the Italian documents, except for the Southern Tyrrhenian Sea where a decreasing trend is evident.

Recommendations:

Protect nursery areas with temporal or stable closures. A general moderate reduction in fishing effort is recommended in order to drive the SSB to a safe level. A stronger reduction in fishing effort is recommended in the Ligurian Sea and in the northern Tyrrhenian Sea (SEC 2005 (266)). The size of first capture should be increased because the mesh size currently in use captures 8-9 cm (total length) individuals (SEC 2002 (1374)).

3.1.2.2 Red mullet (Mullus barbatus)

Diagnosis:

The stock is considered to be fully or overexploited along the entire Italian coasts. However, non negative trends in abundance derived from both fishery dependent sources and trawl surveys have been observed. The current level of SSB is too low to guarantee the long term sustainability of the stock, especially in the case of unfavorable environmental change (SEC 2002 (1374)).

No comment on the present situation of this species is given in the Italian documents, except for the Southern Tyrrhenian Sea where a decreasing trend is evident.

Recommendations:

A seasonal closure during the period of post-recruitment could be theoretically efficient in order to delay the catch of newly settled individuals. A reduction of effort should be generally adopted (SEC 2005 (266)) or encouraged (SEC 2002 (1374)) at least in some areas. Mesh size currently in use determines a length of first capture smaller than the legal size. The enforcement of spatial and temporal closures can determine an increase in the length of first capture. Improving trawl selectivity can also contribute to reduce the exploitation on the juveniles and increase yield (SEC 2002 (1374)).

3.1.2.3 Norway lobster (Nephrops norvegicus)

Diagnosis:

The stock is considered to be not homogeneously exploited. No negative trends in abundance derived from fishery dependent sources or from trawl surveys have been observed. The current level of SSB is acceptable in some areas while it is too low in other areas. This fact may not guarantee the species self-renewal everywhere, especially in the case that environmental change may occur. The size at first capture seems in general adequate while fishing pressure seems to be moderate or in some areas excessive (SEC 2002 (1374)).

No comment on the present situation of this species is given in the Italian documents, except for the Southern Tyrrhenian Sea where a decreasing trend is evident.

Recommendations:

Considering that Norway lobster fishing grounds are not exploited with homogeneous rates everywhere in the area, no management recommendations applicable to the whole area can be made for this species. A fishing effort reduction is advisable especially in the southern portion of the area where the species suffers an elevated fishing pressure (SEC 2002 (1374)).

3.1.3 SICILIAN WATERS

3.1.3.1 Hake (Merluccius merluccius)

*Diagnosis**:***

Hake is in a state of overexploitation both in the Italian and Tunisian coasts as well as in the international waters. The Sicilian trawler mesh-size at 2002 was 28 mm and should be increased to 40 mm (EC minimum size 2000) (SEC 2002 (1374)). The trend of abundance has been described in the document presented by the Italian authorities and shows a slightly decrease in CPUE of both abundance and biomass as estimated by trawl surveys in the last ten years.

*Recommendations**:***

Avoid any increase in number of trawlers. Adopt the 40 mm minimum mesh size. Reduce the trawling time to decrease the fishing effort. Close the main nursery areas (SEC 2002 (1374)).

3.1.3.2 Red mullet (Mullus barbatus)

Diagnosis:

The exploitation status of the stocks along the Sicilian coasts exceeds the equilibrium values. Stock assessment of red mullet inhabiting Tunisian continental shelf showed an overexploitation. The MSY was overcome during the early 1980´s. The time series of biomass indices derived from trawl surveys however does not show decreasing trends in the last fifteen years (SEC 2002 (1374)).

The trend of both abundance and biomass (CPUE from trawl surveys) presented by the Italian authorities show a clear increase in the last ten years (1994-2003).

Recommendations:

Avoid any increase in number of trawlers. Enforce the 40 mm minimum mesh size. Eliminate the trawling on recruits inhabiting the coastal water enforcing the existing normative. Prohibit trawling during the night to contrast illegal fishery. Adopt a trawling ban to protect the recruit's movements towards deeper waters (SEC 2002 (1374)).

3.1.3.3 Norway lobster (Nephrops norvegicus)

Diagnosis:

Assessment carried out in the late 1990´s suggested a status of overfishing. However the indices of biomass from trawl surveys are quite stable in the last years. The prolonged maturity and spawning period reduce the effectiveness of management tools such as seasonal fishing bans (EC-STECF 2002).

The trend of abundance has been described in the document presented by the Italian authorities and shows a slight increase in CPUE in abundance and biomass from trawl surveys in the last ten years.

Recommendations:

Avoid any increase in number of trawlers. Enforce the 40 mm minimum mesh size. Reduce the trawling time to decrease the fishing effort. Improve the technological features of the gear in order to modify the selectivity and to protect the bottom (SEC 2002 (1374)).

3.1.3.4 Deepwater rose shrimp (Parapenaeous longirostris)

Diagnosis:

Since 1980´s deepwater rose shrimp is showing an exploitation rate that is higher than the optimal. An evaluation carried out in the late 1990´s confirmed a situation of overfishing and assessed an increase of 4-6% in yield per recruit and of 25-30% of income per recruit if the 40 mm mesh-size was adopted. These results are not clearly confirmed by the increase in biomass from trawl surveys indices (SEC 2002 (1374)).

The trend in abundance has been described in the document presented by the Italian authorities and shows a slight increase in CPUE in abundance and biomass from trawl surveys in the last ten years.

Recommendations

Avoid any increase in number of trawlers. Enforce the 40 mm minimum mesh size. Reduce the trawling time on the main nursery grounds. Apply a fishing ban to decrease the fishing effort (SEC 2002 (1374)).

3.1.4 SARDINIA

No information on Sardinian stocks is available in the STECF document (SEC 2002 (1374)), while few are available on SEC 2005 (266). Therefore, the information here reported refers to the document presented by the Italian authorities.

3.1.4.1 Hake (Merluccius merluccius)

Diagnosis:

The mean CPUE ($kg \cdot h^{-1}$) estimated from trawl surveys are almost regularly stable in the last 10 years. A Beverton & Holt model shows a general condition of overfishing with value of E

higher than the E_{max}. The SAC-GFCM in 2004 reported different levels of exploitation inside the same GSA 11 and highlighted the good condition of the stock, but possible local overexploitation in some zones.

3.1.4.2 Red Mullet (Mullus barbatus)

Diagnosis:

The mean CPUE ($kg \cdot h^{-1}$) estimated from trawl surveys of the species are almost regularly stable in the last 10 years. A Beverton & Holt model shows a general condition of overfishing with value of E near the E_{max}.

Recommendations:

do not allow the fishing effort to increase (SEC 2005 (266)).

3.1.4.3 Red shrimps (Aristeomorpha foliacea and Aristeus antennatus)

Diagnosis:

A. antennatus shows an increase in the CPUE ($kg \cdot h^{-1}$) estimated from trawl surveys during the last ten years while *A. foliacea* decreases since 1999. However, for both species a status of overfishing has been observed.

3.2 Effectiveness of plan

> *to evaluate whether the scientific analysis allows to conclude that the exploited resources targeted by the plan have been fishing at sustainable or unsustainable levels and if the changes in fishing mortality, prior and after the execution of the plan, will allow higher yields in the long term as well as a reduced biological risk to the fish stocks;*

Taking into consideration the status of the marine resources as described in the point 1, STECF-SGBRE considers that for most of the stocks the fishing mortality has remained stable or has increased during the period of the execution of the plan. However, the reasons behind the observed trend are plausibly of a manifold nature. The expected positive effect of the management measures included in the plan on the fishing mortality (F) of the exploited stocks could have been counteracted by several negative factors. Among those, the increase in the fishing power of the fleet, increase in gear catchability, technical creeping, inadequacy in the design and implementation of the management measures included in the plan (i.e. extension and period of the fishing ban, extension and location of the closed areas) and low selectivity of the gears are the most plausible ones. Those factors act to increase the fishing mortality on the exploited stocks neutralizing the positive effect (e.g. a decrease of the fishing mortality) of the management measures included in the plan. Also other factors that act on the natural mortality of the stock, such the impact of fishing gears on sensitive habitats, could have contributed to observed trend in total mortality of the exploited stocks. STECF-SGBRE considers that management measures of the plans are among those indicated by the scientific community. Given that the status of the stocks has worsened during the period of the implementation of the plan, STECF-SGBRE considers that management measures of the plans are potentially useful but not sufficient and appropriately designed to ensure the long term sustainability of exploited stocks. Also, the implementation and enforcement of the measures should be improved.

Moreover, the increase in selectivity of the gears should be included in the plans as an additional management measures and also the implementation and enforcement of the measures should be improved.

3.3 Long-term profitability of fishery

> *To evaluate whether the plan is able to adjust fishing on the target stocks and main associated species in order to achieve*

greater caches larger and more stable stocks of fish and more profitable fisheries.

The Mediterranean multi-species fishery targets a large number of species using different types of gears in a diversified marine environment. In such diversified environment some of the available tools for the management and the recovery of the exploited biological resources are the control of the fishing effort, the selectivity improvement in the existing gears, the establishment of protected areas and the seasonal fishing ban in significant areas. These measures aim to limit the fishing mortality on the stocks and improve the conditions of the populations through the protection of the most vulnerable part of their life cycle as recruits and spawners. Considering the diversification and overlap of biological cycles between the existing species and the interdependency of associate species, it is obvious that the combination of several management actions will achieve more satisfactory results in a synergistic manner.

The aim of a temporary fishing ban, as designed by the Italian authorities, is to ensure the reduction of the fishing mortality on a fraction of the population, usually recruits, allowing the increase of the spawning biomass. Depending on the period and the target species involved, the seasonal closure allows the avoidance of the recruit's massive mortality. Nevertheless, the temporal fishing ban should be combined with the establishment of permanently closed areas that are located either in correspondence of extensive nurseries and adult concentration of important species and/or of essential fish habitats. These actions jointly with measures aiming to improve the selectivity of the gears and to reduce the fishing effort could be the means for a successful plan aiming to improve the status of the exploited marine living resources.

However, STECF-SGBRE considers that, nonetheless the implementations of different management measures in the last 15 years, most of the stocks currently show clear signs of overexploitation (see point 1) and therefore the existing plans (including a seasonal fishing ban) for the protection of the aquatic resources will not be able to achieve larger catches in the near future and the sustainability of the stocks in the long term.

3.3.1 Italian mainland

The plan for the protection of aquatic resources applied in the Italian peninsula focused on the obligatory ban for bottom and pelagic trawls operating in the area, thought the plan includes other measures as the institution and enforcement of new protected areas or the extension of areas already permanently closed to trawling. There are not data in the available report about the characteristics of those zones and their significance regarding the productivity of the species included in the plan. For the Tyrrhenian and Ligurian Sea, only a voluntary fishing ban is planned. However, the overexploitation status of several target stocks (see point 1) is not compatible with a facultative seasonal ban and a compulsory ban should be applied.

The application of the fishing ban in the Adriatic is not uniform in time and space. It is not clear if the fleets based in ports of one area are allowed to fish in adjacent areas, outside the 12 nautical miles zone. In that case, the fishing pressure on the resources will continue, despite of the closed period, considering that depths in the Adriatic are not very diversified and that the distribution of vulnerable marine populations can be extended in large marine areas, independently of the extension of the national waters. Thus, the extension of fishing ban in limited areas and the shifting in time through different zones significantly reduce the positive impact of the management measure and also complicate the interpretation of the monitoring data. Moreover the voluntary closure in July do not offer additional value to the closure of the areas, taken in consideration that recruitment takes place in the first months of the autumn, while spawning occurs usually in spring. Also, a further reduction of the number of small boats licensed for bottom trawling, the re-allocation and/or extension of protected areas, and, an enhanced selectivity of the gears could significantly contribute to improve the status of the resources.

3.3.2 Sardinia

According to the submitted scientific reports, the management measures applied in Sardinia includes a temporal fishing ban, the conversion of small coastal trawlers in less harmful fishing methods, the introduction of marine protected areas and the definition of a minimum landing size according to the age at first maturity. The fishing ban was applied in Sardinia from 1988. However, despite the extension of this measure for such a long period and the application of additional measures, the stock indexes available in the report does not show a decrease in F for the stocks exploited in the area and included in the report. The apparent mismatch between applied measures and observed trends in F and biomass presented in the report could be due to an inadequate enforcement and control of the related actions, the limited extension of the closed areas or the shortness of the closed season. Furthermore, the existence of such a large number of small coastal trawlers could affect negatively the results of the management measures included in the plan. STECF notices that the status of stocks exploited by the small scale artisanal fisheries, which are included in the temporary fishing ban, is not presented in the documents presented by the Italian authorities.

3.3.3 Sicily

In the document (ED/TN/FF/9/0805/REL.1), the Institute IRMA-CNR proposed the application of a seasonal closure of 45 consecutive days, from 15 September to the end of October. This period is focused on the reduction of fishing mortality of spring spawning species avoiding that recruits are captured using bottom trawls in autumn. In the same document additional measures are proposed, as the improvement of the selectivity through the enforcement of the 40 mm and the increase to 48-56 mm mesh size for deep-sea fisheries, the establishment of closed areas for those species whose juvenile individuals inhabit deep waters and the continuation of fishing ban during week-ends and public holidays. Those measures are aimed to reduce further the fishing effort. In the document of the Sicilian Region referred to the planning of fishing ban for 2005, the proposed period is further reduced to thirty consecutive days and more inadequately in two periods of 15 days each, a measure that is in disagreement with the proposal made by the scientific community and will decrease its effectiveness to reduce F on the target stocks. Regarding the rest of the measures proposed, the possibility to increase the selectivity in towed and fixed gears is not taken in consideration and the proposal for the establishment of new closed areas seems to be unsatisfactory for the importance of the species involved.

The ban for the netters for 45 days starting at 1st of April is proposed in the decree for 2006 as an additional measure for the protection of spawners, considering that most of the coastal species spawn during this period. Although is not easy to quantify the benefit from each action, it is likely that the combination of different measures will improve the stocks conditions and consequently the fishing ban should be considered only as part of a more comprehensive protection plan aiming to reduce fishing mortality and secure the long term sustainability of the exploited stocks.

STECF notices that limited information on the status of stocks exploited by the long-liners and small scale artisanal fisheries, which are included in the temporary fishing ban, is not presented in the documents presented by the Italian authorities.

3.4 Alternative analyses

to evaluate whether and why other type of analysis could/should have been taken into consideration to set up the basis and to evaluate the appropriateness of the plans;

3.4.1 General considerations

A first consideration to be taken into account to propose a protection plan is the scientific basis supporting the objectives of the plan. The plan should identify what is the problem to be addressed. Assuming as the starting point that the stocks addressed by the plan are

overexploited, the main objective should be to resolve a situation of overexploitation and this can be done through the following management actions:

3.4.1.1 Particular objectives

1. to protect distinct age-size segments of the stocks
2. to decrease the fishing mortality
3. to protect essential fish habitats (nurseries, reproductive areas, etc)

Even if the knowledge is limited, but evidences suggest overexploitation, a plan should refer to the precautionary approach. In order to evaluate the plan it is necessary to monitor a series of measurable indicators of the status of the stocks and the fishery and to relate them to reference points representing the objectives of the plan. Short-medium term analysis of the stock indicators should be included. Many indicators are available, but none of them alone can explain the success of failure of the plan, and they should be used in concert. Some indicators refer to the properties of the stocks and can be monitored by fishery-independent methods others require data from the fishery. This set of indicators should include the classical ones from the single-species approach but also multi-species and ecosystem indicators. The use of such indicators involves several different methods. A very short list of examples of indicators with related data and methods is given below:

Single species

1. F vector	data from fishery,	analytical methods
2. Global Z	data from trawl surveys	analytical methods
3. Biomass	data from trawl surveys / fishery	analytical methods
4. CPUE	data from fishery	statistical methods
5. Mean size in the catch	data from fishery	statistical methods
6. Effort	data from fishery	statistical methods
7. Y/R analysis	data from fishery	analytical methods

Multispecies

1. •Specific composition of the catch. Biodiversity
2. •Discards

Ecosystem

1. Restoration of essential fish habitats

3.4.1.2 measures

Three different kinds of measures are included in the plan presented by the Italian authorities:

1. Seasonal closures
2. Area closures
3. Decommissioning of vessels

3.4.2 Italian mainland

The data and methods presented are the following: Abundance and biomass, in $n \cdot km^{-2}$ and $kg \cdot km^{-2}$, respectively and length distribution by sex for *Merluccius merluccius* and *Nephrops norvegicus* based on data collected during the trawl surveys GRUND/MEDITS 2000-2003. Results are disaggregated by depth stratum and for the 7 GSAs of the Italian waters. The documents presented do not include any further analysis or indicators. It is not possible to assess the effectiveness of the plan on the basis of the biological data presented here. There is actually an important amount of information that should be exploited in a more efficient way. From these data estimates of SSB trends could be obtained. After a request for additional information, a time-series of abundance from 1996-2004 for 42 species in GSA 17 (North Adriatic) and a time-series of total abundance were presented. Most of the species show an increasing or not significant trend. However, it is important to highlight that trend

in CPUE in number of individuals (abundance) does not mirror trend in the adult biomass of the stock (SSB) but they generally mirror the temporal dynamic of recruitment.

3.4.3 Sicily

The establishment of two permanent closed areas (named zone A and zone B) in international waters in GSA 15 and 16 were proposed by the competent authorities. These two zones have been proposed because are considered as important and permanent nurseries for *Merluccius merluccius* (and probably also for *Parapenaeus longirostris*). The data used to identify the areas are based on trawl surveys and were considered reliable. However, the surfaces are too small (approximately 90 km^2 and 160 km^2; about 11% of the nursery area individuated in the document). Therefore, STECF-SGBRE recommends that the areas should be larger (at least 4 times larger in extension) to be significant for the long term sustainability of the resources. For comparative purposes, the areas approved for protection by the GFCM 2006 in international waters consist of surfaces ranging from 1000 to 10 000 km^2.

Considering that the areas proposed by the Sicilian authorities are placed in international waters, and that the plan only covers Sicilian vessels, STECF-SGBRE strongly suggests submitting this proposal to the GFCM through SCSA and SCMEE to enforce the protection at the international level.

3.4.3.1 Analysis of the demersal species and small pelagic fish in the Straits of Sicily

1. Fleet capacity index (1996-2004)
2. Biomass indices (1994-2004)
3. For the species: *Merluccius merluccius, Mullus barbatus, Mullus surmuletus, Pagellus erythrinus, Parapenaeus longirostris, Aristeomorpha foliacea, Illex coindetii, Eledone moschata, Eledone cirrhosa, Engraulis encrasicolus* and *Sardina pilchardus*, the following data and indicators were presented (generally 1994-2004):

   a) abundance and biomass in n·km^{-2}, kg·km^{-2}, respectively
   b) mean length
   c) sex ratio
   d) adult ratio
   e) length at first maturity
   f) reproductive season
   g) nursery areas
   h) area stock distribution
   i) Stock-recruitment relationships (for some species)
   j) Y/R analysis (for some species)
   k) short-medium term analysis of stock trend and simulations (for some species)

The methods used in Sicily are appropriate, although most of them are merely descriptive. All these analyses are useful to evaluate the appropriateness of the plans, but may be not sufficient. STECF-SGBRE considers that other kind of indicators such as trends in F and SSB should and could have been estimated to allow a more comprehensive evaluation of the appropriateness of the plans.

3.4.4 Sardinia

Methods used:

1. Global Z estimates (1995-2004) from trawl surveys, for *Merluccius merluccius, Mullus surmuletus, Aristeus antennatus* and *Parapenaeus logirostris*
2. Growth parameters for the above mentioned species
3. CPUE series (1995-2004), from trawl surveys for the above mentioned species

4. VPA for *Mullus barbatus* and *Aristeomorpha foliacea* using data from 1994-2002 and 7 zones

    a) M estimates using Pauly's method
    b) Tuning not specified
    c) Reference points for F from yield per recruit analysis (Y/R; equation of Beverton and Holt)

5. Analysis of the biodiversity (1994-2003)
6. Analysis of commercial catch (1998-2005)

    a) Landings
    b) CPUE (yield by boat and month)

7. Analysis of Merluccius merluccius, Mullus surmuletus, Aristeus antennatus, Parapenaeus longirostris and Eledone cirrhosa. Z values were obtained analyzing trawl surveys data and to perform Y/R analyses.

Sardinia presents a satisfactory set of analysis and stock indicators (including a multi-species approach). The methods are adequate taking into account the data available and the results are useful for evaluation of the appropriateness of the plans. However some of the analysis (i.e. Y/R form trawl surveys) may go beyond the possibility of the method. Input data of the Y/R are fishing mortality at age and weight at age. Those derived from survey are obviously different from those estimated from the different fleets. On the other hand some information about SSB trends and target reference points (i.e. fishing mortality) would be very useful.

3.5 Use of data

> *to evaluate whether the scientific basis of the plan has taken stock of and full exploited the monitoring data gathered through the Community data collection programme (Council Regulation (EC) 1543/2000).*

STECF considers that according to the documents available at the meeting, the Italian national Plan 2004-2006 is essentially devoted to only two fishing segments (bottom and pelagic trawlers), while no data are available on other segments (e.g. netters) of the fleet fishing on the same resources. At the same time, although the plan stressed the multi-species target of the Italian fishing fleet, it is limited to only four species, divided in two groups: hake and Norwegian lobster in offshore waters, and red mullet and cuttlefish in coastal waters. These four species have been chosen due to the base of the "high fishing pressure" existing on them.

3.5.1 Italian mainland

According to the plan for the protection of aquatic resources in 2004 (Decree 2 July 2004) and in 2005 (Decree 14 July 2005), it is clear from the preamble that the plans, besides of the socio-economical data and considerations, is based on some basic biological information concerning all Italian seas. This biological information is attached to the plan and available at the meeting but limited to four years data (2000-2003) of GRUND and MEDITS surveys. However, those data are restricted to only two species (hake and Norway lobster), while no reference is available for the other two species included in the plan (red mullet and cuttlefish) nor to any other species or stock reported in Annex 12 of Council Regulation (EC) 1543/2000. Data up to 2005 were available in the beginning of 2006 and could have been included in additional documents.

According to the plan, no fishery dependent data coming from the DCR have been used. However, it is important to consider that those data series available at the beginning of

2004 were only limited to the years 2001 and 2002, while data for 2003 have been made available in the late 2004.

According to the scientific documents attached to the Italian Government letter no. 2005/24867 dated 1 September 2005 (Annex 1), fishery dependent data collected within the DCR were included. Anyhow, how and which those have been used is not clearly specified in the documents presented by the Italian Authorities.

3.5.2 Sicily

The documents provided by the Sicilian authorities in response to the EC request no. D01474 provides a series of information and scientific data not mentioned in the Sicilian Decree, with a broad overview of the fishing activity. This document provides data from GRUND and MEDITS surveys on *Merluccius merluccius, Mullus barbatus, Mullus surmuletus, Parapenaeus longirostris, Aristaemorpha foliacea* and *Nephrops norvegicus.* Basic information from other sources is provided on *Engraulis encrasiculos, Sardina pilchardus, Thunnus thynnus, Thunnus alalunga, Sarda sarda, Euthynnus alletteratus, Tetrapturus belone, Xiphias gladius, Seriola dumerili, Coryphaena hippurus,* with several suggestions on their management. No reference is made about specific stocks or fishery dependent data collected within the DCR.

The plan for the protection of aquatic resources adopted by the Region of Sicily in 2005 (Decree 5 August 2005), in addition to the previous synergy with the Italian national plan, reports a clear reference to a scientific study by the CNR. The report provides a good overview of the various gear and fleet segments and very detailed scientific data on *Merluccius merluccius, Mullus barbatus, Mullus surmuletus, Phycis blennoides, Engraulis encrasiculos, Sardina pilchardus, Spicara flexuosa, Micromesistius potassou, Parapenaeus longirostris, Aristaemorpha foliacea, Nephrops norvegicus, Aristeus antennatus, Eledone cirrhosa, Illex coindeti, Octopus vulgaris* and *Sepia elegans* from the Strait of Sicily and the Tyrrhenian coast; basic information is provided on *Thunnus thynnus, Thunnus alalunga, Sarda sarda, Euthynnus alletteratus, Tetrapturus belone, Xiphias gladius, Seriola dumeril* and *Coryphaena hippurus;* no info is available for the Ionian coast. Most of the stocks included are in the Annex 12 of the DCR, but the list presented in the scientific documents is not complete. In this case, the data are from GRUND, MEDITS, CAMPBIOL and DISCARD surveys and these projects are carried out within the DCR. Although a sound scientific background of the stock status was available, the Sicilian Decree followed the same approach of the previous year, focusing generally on fleets more than on stocks or species.

The draft Plan for the protection of aquatic resources proposed by the Sicily Region in 2006 makes again a clear reference to scientific studies provided by the CNR, ICRAM and CONISMA. Only the 2005 CNR reports were provided by Sicilian authorities and made available at the meeting.

3.5.3 Sardinia

According to the Plan for the protection of aquatic resources adopted by the Sardinia Region in 2003 (Decree 20 February 2003 and Decree 24 July 2003) and in 2004 (Decree 18 February 2004 and Decree 18 August 2004) it appears that these regulations have been adopted on the basis of the Italian national Plan, without any specific reference to additional scientific background. However, reading the Decrees, it appears quite clear that there is at least a good knowledge of the fleet segmentation.

The Sardinia Region had provided two scientific documents that are considered as the scientific base for the Regional Protection Plan. These documents, produced by the University of Cagliari in 2004, contain a considerable amount of information, data and analysis, concerning *Mullus surmuletus, Merluccius merluccius, Aristeus antennatus, Aristaeomorpha folòiacea, Parpenaeus longirostris* and *Eledone cirrhosa.* These stocks are all included in Annex 12 of the DCR, but the list presented in the scientific documents is not complete. No specific references have been made to the DCR within the two documents, but it is likely that fishery independent data collected within the DCR framework (i.e. GRUND, MEDITS and CAMPBIOL surveys) have been used.

3.6 Validity in Mediterranean context

> *to advise whether and why there may be scientific analysis in the fisheries science toolbox which are not valid to assess the state of exploited resources in the Mediterranean;*

The well-known "specificity" of the Mediterranean fisheries does not impede the use of any standard stock assessment method. Often such specificity, in particular the number of species and gears, has been used as an excuse for not applying such methods. Complexity should not be a justification to avoid analysis.

Any stock assessment method is based on some assumptions and constraints. In many cases such assumptions are not completely fulfilled by the data, but even in such instances the results can be valuable. It is up to scientist to interpret correctly the results and estimate their potential biases on the basis of careful methodological considerations. Quite simple methods can allow detecting overexploitation, and although the precise value of the indicator could be inaccurate, this is sufficient to give a warning advice and to trigger the implementation of management measures. In some cases, some models are actually too much simple (i.e. steady state assumption) to provide reliable results. Thus, alternative, but more complex, models exist (i.e. dynamic models) and should be used.

Many fisheries models are available for stock assessment. These models differ greatly in their mathematical structure, assumptions, data requirement, biological and ecological implications, and output. The choice of a model for a given fishery is often decided by the quantity of the information available to stock assessment (Chen et al., 2003). Data availability is a real problem in the Mediterranean, and effort should be addressed to remedy it. The classic single-species stock assessment methods can be applied to the Mediterranean resources, as well as more complex and realistic approaches such as, multispecies, bio-economic and ecological models, which constitute the future methodology of the ecosystem approach to fisheries (EAF). Therefore, STECF-SGBRE concludes that there are no stock assessment methods exclusively applicable, or not applicable, to the Mediterranean resources.

3.7 Geographical range

> *to evaluate whether the scientific analysis ensures a full coverage of geographical stocks and fisheries involved in the plan for the protection of the resources and which areas, fisheries and stocks are not covered;*

As a general statement, according to the documents available at the meeting and the plans concerned, it is quite evident that the existing regulation is trying to manage some fleet segments without a specific reference to single stock. Such regulation could be regarded as an indirect way to manage several species harvest together by the same fleet.

3.7.1 Italy mainland

According to the Italian national plan for the protection of aquatic resources 2004-2006 concerning the bottom and pelagic trawlers, the plan target only two groups of species (hake and Norway lobster and red mullet and cuttlefish). Obviously, the plan, covering entire fleet segments, protects other species (i.e. seasonal extension of the trawl fishing ban and the pelagic trawl seasonal closure) though those are not specifically identified in the plan. Nothing is mentioned about segment of fleet targeting large pelagic species and several other gears as gill nets, pots, traps, dredges, hydraulic dredges, purse-seines, long-lines, hand-lines and tuna seines. Also, recreational fishery is not included. The Italian national Plan covers all the seas, excluding only the autonomous Regions of Sicily and Sardinia, because those regions have a specific competence on fishery issues. But, looking at the measures in the plan, some areas have a mandatory fishing ban while others (Tyrrhenian Sea and Ligurian Sea) have only a facultative closure. This is not coherent with the overexploitation status of the resources in the Tyrrhenian and Ligurian Sea as indicated by the scientific community. The scientific data provided with the letter no. 2005524867

(1st September 2005) include several technical and economic data about some fisheries, but not the biological data for all stocks from the Adriatic Sea. According to the scientific expertise available at the meeting, Italy has the scientific knowledge and data to cover all fisheries, areas and stocks.

3.7.2 Sicily

The Sicilian Plan in 2004 covers all the seas around Sicily, it has different time closure for the various Maritime Compartments and a subsequent partial overlapping of the periods. The plan covers all the fisheries but the fishing ban is mandatory only for bottom and pelagic trawlers while it does not cover the recreational fishery. The 2004 Sicilian plan has no specific reference to single stocks or species.
In the 2005 Sicilian plan the coverage of the fisheries is complete, with the exception of fishing vessels engaged in "pescaturismo". Again, recreational fishery is excluded from the plan. In 2005 plan, the closures were implemented at the same time in the various seas around Sicily.

The draft Plan for 2006 has a more detailed list of fisheries, with various time closures according to each fishing gear (or aggregation of different fisheries). In this draft plan, all the fisheries are included, except for the troll recreational fishing (usually targeting juveniles of large pelagic in autumn) that is allowed to operate during the same period when a closure is established for surface gear to protect juvenile swordfish.

The identification of two areas in the Strait of Sicily for protection of hake recruitment is included in the most recent scientific documents and in the draft Plan for 2006 and it is considered useful but not sufficient to improve the stock status of species covered in the Sicilian plan. For the stocks covered by the scientific papers provided by the Italian Government and concerning the Sicilian area, there is detailed information in the point 5 of this report. However, information on the status of the stock and fisheries for the Ionian Sea and for stocks target in the small scale artisanal fisheries are not included in the plan.

3.7.3 Sardinia

The Sardinian plans show some slight differences from year to year. All the Plans cover the entire area.

The plan adopted by Sardinia in 2003 includes all the fishing vessels registered in Sardinia. Then, in theory, all the stocks should be included, but this is not the case. The fishing ban is facultative for purse-seiners fishing for small pelagic species, for surface long-liners fishing for swordfish and for the small bottom trawlers between 15 to 30 GRT; furthermore, trawlers having also the long-line licence have the possibility to chose to continue the fishing activity with swordfish long-lines even during the fishing ban for trawlers, but outside the territorial waters. Some fisheries or fishing activities are excluded from the time closure: the sport game fishery, the professional dive fishery, the coral fishery, while most of the recreational fishery is not included in the fishing ban.

The plan adopted by Sardinia in 2004 contains the same rules as in the previous year, with the exclusion from the fishing ban for the small bottom trawlers below 15 GRT registered in the Maritime Compartment of Cagliari and operating in the southern part of Sardinia.

The stocks covered by the scientific papers provided by the Italian Government and concerning the Sardinian area are detailed in point 5 of this report.

3.8 Compliance of measures with plans

to evaluate whether the measures implemented in the legislative acts match with the alternative management measures identified and justified in the various scientific reports. Identify also if an uneven implementation of the temporary fishing ban between areas is justified on the basis of the different conditions of exploited resources targeted by the plan;

STECF-SGBRE consider that the measures implemented in the legislative acts match only partially with the management measures identified and justified in the various scientific reports (SEC 2002 (1374)) and documents attached to the plans. As recommended by STECF (SEC 2002 (1374)), effective management measures for the protection of the marine resources should not only include a compulsory fishing ban, which, provided that it reduces substantially the yearly total number of days at sea of the fleet, is considered as an effective way to reduce fishing effort but also:

1. a progressive reduction of the effective fleet capacity
2. the establishment of permanent closed areas to all fishing activity where both recruitment but also spawning aggregation and concentration of adult individuals of the exploited species are located
3. an increase in selectivity of the gears in order to decrease F on the juveniles and reduce discard

However, the implementation of those measures must be proven to be effective to reduce F, increase SSB, R and mean age and size of the stocks, maintain biodiversity and improve the status of essential fish habitats (as identified in the STECF-SGMED report) in the time frame established by the plan. STECF-SGBRE consider that the plans have not clear measurable objectives, in terms of targets to achieve (i.e. level of F and SSB, mean size/age of the stock, biodiversity, etc) as well as a time frame for achieving and a set of complementary measures if the objectives are not met (see general guidelines established by the Commission in EC 2792/1999). Management measures, as indicated by STECF (SEC 2002 (1374)), including a compulsory fishing ban, should be extended also to the entire Ligurian and Tyrrhenian Sea, where a condition of overexploitation has been shown for several target species (see point 1 and SEC 2002 (1374)).

3.9 Contribution to reduction in mortality and effort

> *to evaluate whether and how much the temporary fishing bans and complementary measures, if any, have been contributing to reduce the fishing mortality and the fishing effort as well as to improve sustainable exploitation of targeted resources;*

Taking into consideration the status of some stocks as briefly summarized at point 1 of this report, STECF-SGBRE considers as very urgent the implementation of efficient protection measures for most of the stocks. According to the available documents, a general reduction of the fishing mortality on the main target species cannot be demonstrated. As an example, series of estimated fishing mortality for two species *Mullus barbatus* and *Aristeomorpha foliaciea*, in Sardinia (disaggregated in 7 zones) from 1994 to 2002 showed that fishing mortality has been fluctuating in the last decade in the different areas. The fishing ban was in place since 1988, but the observed trends do not show any clear change in F regime after 1998. Also, from Z estimated for a number of species in the entire area, it is evident that fishing mortality has generally remained stable after the execution of the plan. However, the Y/R analysis showed a situation of overexploitation with current E larger than E_{msy} for most of the stocks included in the plan.

On basis of the documents provided, STECF is not able to assert if the fishing bans contributed to the changes in fishing mortality. STECF considers also that it is not possible to disentangle (i.e. partial F from the different measures) the effect of different measures since those have been in force at the same time in the Sardinian waters. STECF-SGBRE recognize that if the management plans will continue to include a temporary fishing ban, then a strictly compulsory, continuous and extended ban should properly cover all fishing areas and fleets in terms of time and space. However, the design in terms of period of closure must be revisited and planned to match with the period of recruitment of the target species included in the plan.

Regarding the fishing effort, (estimated as number of boats * fishing days at sea) and assuming that the ban has been fully enforced, the data shows a decrease since 1998 in the Sardinian waters.

3.10 Relevance of closed areas to stocks

To evaluate whether the implemented closed areas, in terms of location and dimensions, are relevant for the concerned stocks;

There is not enough information to evaluate in details if the implemented closed areas are relevant for the concerned stocks. One of the three Sicilian closed areas (i.e. Golfo di Castellamare; GSA 10) has been proved to be effective and therefore is considered as a reference case study, but otherwise not much is available for the other areas.

STECF-SGBRE considers that in general the surface of closed areas is too small compared to the total distribution area of the stock and often covers only partially essential fish habitats. Therefore, STECF-SGBRE recommends that the areas should be larger (at least 4 times larger in extension than the actual areas) to be significant for the long term sustainability of the resources. For comparative purposes, the areas approved for protection by the GFCM 2006 in international waters consist of surfaces ranging from 1000 to 10 000 km^2.

Therefore, although those areas might have a positive effect in terms of F and biomass at the local level, they are likely to be inefficient to significantly decrease F and increase SSB at the stock level. The correct location and extension of protected areas should be given a priority selecting significant areas where essential habitats for the most important marine living resources are persistent in time. No information has been made available at the meeting for the importance of the areas as essential fish habitats and the distribution of the fishing effort prior the adoption of the closed area.

3.11 Effect on operation of fleets

to evaluate whether the closed areas implemented in conjunction with the plan affect and how the operations of fleets involved in the plans.

The lack on information on the spatial distribution of the fishing effort (i.e. VMS data) does not allow STECF-SGBRE to evaluate whether and how the closed areas affect the operations of fleets involved in the plans.

3.12 Changes in plans

to evaluate whether between year changes in the execution of the plan are scientifically justified and if they may negatively influence the effectiveness of the plan.

The main measure of the proposed protection plans is the temporal fishing ban, aiming to reduce the fishing mortality exerted mostly on the recruits of demersal species, especially for spring spawners. The recruitment of these species starts in autumn and depends on the drastic oceanographic changes observed every year during this period. The changes of the hydrographic dynamics during the autumn period could be the signal to start the migration toward deeper waters. These changes are unlikely to come at the same period each year, but according to the general climate conditions usually appear during October or shift later in the autumn. For this reason the establishment of a too short closed season, aiming to preserve recruits, could fail to coincide with the peak of recruitment but a larger period should cover more efficiently the extension of recruit's movement. A period of 45 days starting at 15 of September each year could cover efficiently the recruitment period of spring spawners species in most of the Italian marine regions. On the other hand, a different seasonality, the partition of the ban in two separate periods and a voluntary ban for some areas will result in the ban not be able to cover effectively the migration period

and thus achieve the desirable objectives in terms of reducing F and protect the recruitment. As a matter of fact, a ban designed in the way described above will increase the risk of a mismatch of the period of the ban with the peak in recruitment of the spring spawner species in the area. Therefore, in an optimal plan aiming to protect the recruits, the closed period should be related with the regional oceanographic changes. However, due to the existing difficulties to detect on time the start of the migration, a minimum continuous period of 45 days should secure the coverage of the main part of the recruits.

Regarding Sicily, the closed season during spring starting at 1st of April according to the decree of 2006, aiming to protect the spawners is probable to match better with the spawning period of red mullet and other demersal species, even if this period might be postponed in some years during early summer. The Sardinian plan in 2003-2004 adopted a closure starting at 1st of March, which could be valid only if the time of spawning of the target stocks in the area would suggest an earlier application of the ban.

Generally, the plans are not strictly based on the main biological features of the stocks, such as peak in spawning season and time of recruitment.

3.13 Possibility of evasion

> *to evaluate whether the expected results may be voided by alternating temporary fishing bans between adjacent maritime departments taking into consideration the mobility of the fleets, the location of operating fishing grounds and uneven distribution of exploited resources between territorial and international waters;*

As currently enforced by the Italian Authorities, the fishing ban are, in the last years, organized alternating bans between adjacent maritime departments. The fishing bans are limited in both the spatial and temporal extension and alternating limited areas in time would reduce the positive effects of the plan for the protection of the stocks. STECF-SGBRE considers that, for the specific cases of temporary fishing bans, they should be compulsory and extended to large areas (at least to the GSA level), in order to reduce the movement of effort (i.e. fishing vessels) between adjacent areas outside the 12 miles that would vanish the positive effect (i.e. reducing the fishing mortality) expected by the ban. Moreover, in the period (at least 3 months) following the end of the fishing ban, STECF-SGBRE suggest that the fishing pressure should be limited over and beyond what is already enforced at national or Community level further restricting the time at sea. This could be achieved, for example in the demersal fisheries, limiting the fishing operations to the daylight hours only. The ban should target the main period of juvenile concentrations, the adult spawning aggregation and concentrations and all the other essential fish habitats. The temporal extension of the ban must be established in order to bring the average yearly F on target stocks below between F_{01} and F_{max}.

3.14 Capacity reductions

> *To evaluate whether in conjunction with the plan there has been, for the fleet areas covered by the plan, a permanent reduction of the fishing capacity with respect to the period before the plan;*

The available information gives a picture of a general reduction of the fishing capacity in the different areas covered by the plans in the period 1999-2003. However, a reduced fishing capacity does not necessarily imply a reduced fishing effort and fishing mortality exerted on the stocks. As a matter of fact, the observed reduction in fishing capacity has not resulted in a reduction of fishing mortality in the period of the plan (see point 1). The problems of separating the different effects (in terms of partial F) of positive measures (fishing bans, closed areas, etc) with negative effects contemporary present (increase of engine power and fishing gear efficiency, damage of important fish habitats, etc) has been previously discussed in point 9 of this report.

3.15 Impact of no action

To evaluate whether and why the absence of a recurrent temporary fishing ban concerned fleets may further deteriorate the state of exploited resources;

The evident overfishing condition observed for most of the stocks in the areas involved by the plans, can clearly be further deteriorate by the total absence of the currently implemented management measures. Nevertheless, the management measures included in the plans are among those indicated by the scientific community but the manner those measures are designed is not sufficient for the protection of the target stocks. Also, the implementation and enforcement of the measures should be improved. The main topic evidenced from the large amount of documents evaluated is a need for a better design of the measures applied in order to obtain a significant effect for the long-term sustainability of exploited living marine resources along the Italian coasts, in Sicily and Sardinia. Finally, a standardized way to present scientific information used to justify management measures implemented in the plan is advisable.

4 STECF-SGBRE FINAL CONSIDERATIONS AND RECOMMENDATIONS (ALL AREAS)

1. STECF has revised the report of SGBRE and provided an opinion on the major considerations and recommendations. Detailed answers to each of the TORS are given in the SGBRE report. Due to time constraints and lack of expertise and information available at the meeting, STECF-SGBRE was unable to answer in full details to some of the TORS, especially those related to the full evaluation of the closed areas as effective to purse long term sustainability of the resources.
2. STECF-SGBRE recognizes that, nonetheless the implementation of different management measures in the last 18 years, several important marine living resources (i.e. hake, red mullet, deepwater rose shrimp) around Italian coasts are overexploited (see SEC 2002 [1374] on Mediterranean shared stocks, SEC 2004 [772] on Mediterranean fleets, SEC 2005 [266] on the state of the stocks and GFCM-SAC reports).
3. STECF-SGBRE considers that the measures currently included in the Italian plans are among those indicated by the scientific community.
4. STECF-SGBRE considers that in accordance with Community rules, plans for the protection of marine living resources must include additional and supplementary technical measures designed to further reduce fishing mortality over and beyond what is already enforced at national or Community level.
5. STECF-SGBRE considers that the scientific information used to establish the guidelines of the plans are not exhaustive. However, STECF-SGBRE recognizes that a significant difference exists in the information and the analysis presented by Sicily and Sardinia compared to Italian mainland. Italian mainland has presented incomplete information for areas and species, limiting stock trends to abundance and not biomass of the species and without a full analysis of the actual level of exploitation in respect to the long-term sustainability of the stocks.
6. STECF-SGBRE considers that the plans have not clear measurable objectives, in terms of targets to achieve (i.e. level of F and SSB, mean size/age of the stock, biodiversity, etc) as well as a time frame for achieving and a set of complementary measures if the objectives are not met (see guiding principle established by the Commission in EC 2792/1999). STECF-SGBRE also reiterates that protections plans should follow the general guidelines delineated by STECF in the report of the November 2005 plenary session.
7. STECF-SGBRE considers that the expected positive effect of the management measures, included in the plan could have been counteracted by several negative factors. Among

those, an increase in the fishing power of the fleet, increase in gear catchability, technical creeping, the implementation of the measures, inadequacy in the design of the management measures included in the plan (i.e. extension and period of the fishing ban, extension and location of the closed areas), deterioration of essential fish habitats, low selectivity of the fishing gears, etc might represent the most plausible ones. Also, it is impossible to disentangle the effects of different factors and management actions on the fishing mortality of the exploited stocks in the last decade.

8. STECF-SGBRE considers that management measures of the plans are useful but not sufficient and appropriately designed to ensure the long term sustainability of exploited stocks. Also, the implementation and enforcement of the measures should be improved.
9. STECF-SGBRE, noting that most of the stocks are currently overfished, considers that the situation can be further deteriorated if the currently implemented management measures are completely eliminated.
10. STECF-SGBRE recommends that if the management plans will continue to include a temporary fishing ban, then a strictly compulsory, continuous and extended ban should properly cover all fishing areas and fleets in terms of time and space. The ban should be extended to large areas (at least to the GSA level), in order to reduce the movement of effort (i.e. fishing vessels) between adjacent areas outside the 12 miles that would vanish the positive effect (i.e. reducing the fishing mortality) expected by the ban. Moreover, in the period (at least 3 months) following the end of the fishing ban, STECF-SGBRE suggest that the fishing pressure should be limited over and beyond what is already enforced at national or Community level further restricting the time at sea. This could be achieved, for example in the demersal fisheries, limiting the fishing operations to the daylight hours only. Also, the design in terms of period of closure must be revisited and planned to match the period of recruitment of the target species included in the plan.
11. STECF-SGBRE recommends that the correct location and extension of closed areas should be given a priority in order to select areas where sensitive and essential fish habitats for the most important marine living resources are persistent in time. STECF-SGBRE recommends that the areas should be larger (at least 4 times larger in extension than the actual areas) to be significant for the long term sustainability of the resources. For comparative purposes, the areas approved for protection by the GFCM 2006 in international waters consist of surfaces ranging from 1000 to 10 000 km^2.
12. Those areas should be aimed to protect sensitive and essential fish habitats as well as important areas of concentration of adults of the target species included in the plan.
13. STECF-SGBRE recommends effective management measures for the protection of the marine resources should not only include a compulsory fishing ban, which, provided that it reduces substantially the yearly total number of days at sea of the fleet, is considered as an effective way to reduce fishing effort but also:

    a) a progressive reduction of the effective fleet capacity
    b) the establishment of permanent closed areas to all fishing activity where both recruitment but also spawning aggregation and concentration of adult individuals of the exploited species are located
    c) an increase in selectivity of the gears in order to decrease F on the juveniles and reduce discard

    The implementation of those measures must be proven to be effective to reduce F, increase SSB, R and mean age and size of the stocks, maintain biodiversity and improve the status of essential fish habitats (as identified in the STECF-SGMED report) in the time frame established by the plan
14. STECF-SGBRE recommends that indicators of the status of the main target stocks (i.e. F, SSB, mean size, etc) prior to the inception of the plans should be provided.

5 REFERENCES

Chen, Y., L. Chen, L. & K. I. Stergiou. 2003. *Aquat. Sci.* 65:1–7.

APPENDIX – NAMES AND ADDRESSES OF PARTICIPANTS

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