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COMMISSION STAFF WORKING DOCUMENT

20th REPORT OF THE SCIENTIFIC, TECHNICAL AND ECONOMIC COMMITTEE FOR FISHERIES

Brussels, 04-08 April 2005

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.

Contents

1 Introduction

The 20th meeting of the STECF was convened at the headquarters of DG FISH, 99 Rue Joseph II, Brussels from 4-8 April 2005.

The terms of reference for the meeting were surveyed and briefly discussed to arrange the agenda and timetable. The session was managed through alternation of plenary and parallel working groups meetings.

The 20th meeting of the STECF was also attended by invited experts from Member States that acceded to European Union in 2004.

1.1 List of participants

The complete address of the participants is listed in Annex 1.

Members of the STECF:	Ardizzone,Giandomenico
	Bertignac, Michel
	Camiñas, Juan Antonio
	Cardinale, Massimiliano
	Casey, John (Chairman)
	Di Natale, Antonio
	Dickey, Collas Mark
	Ernst, Peter
	Fariña, Celso Antonio
	Franquesa, Ramon
	Gustavsson, Tore
	Keatinge, Michael
	Kuikka, Sakari
	Lokkegaard, Jorgen
	Messina, Gaetano
	Munch-Petersen, Sten
	Perraudeau, Yves
	Petrakis, George
	Polet Hans
	Rätz, Hans-Joachim
	Simmonds, Edmund John
	Somarakis, Stylianos
	Vanhee, Willy
	Virtanen, Jarno
Invited experts:	Grzebielec, Ryszard
	Krušnik, Ciril
	Kuzebski Emil
	Redant, Frank
	Saat, Toomas
	Vitins, Maris
	Statkus, Romas
	Van Ooostenbrugge, Hans
JRC:	Althoff, Wiking
	Doerner, Hendrik
	Geronymaki, Maria
	Shepherd, Iain
	Ziegler, Robert
DG-FISH	Biagi, Franco
	Hagstrom, Olle
	Moguedet, Philippe

1.2 Terms of reference

1.2.1 Information from the Commission and reflections on scientific advice improvement (I)

1) Reinforced role of STECF and strengthening of its Secretariat. (new Commission Decision, rules of procedure, economic advice, etc..)
2) Information on selection of proposals presented under the Call for proposal FISH/2004/03 and way forward
3) Financial issues to support the provision of scientific advice through the STECF and other ad hoc working groups.

1.2.2 Sandeel fishery

STECF is requested to evaluate and to comment as appropriate the **report** prepared by the ad hoc working group (08-10 February 2005) with particular attention on the suitability of the agreed methodology. STECF is also requested to agree on the fast written procedure to adopt its opinion on the strength of the sandeel 2004-class strength by 10th May.

1.2.3 Management year(s)

STECF is requested to advise on the most suitable management year(s) for the various fisheries undertaken in ICES area by taking into consideration seasonality, mixed nature of the fisheries and biological characteristics of exploited marine living resources as well as the timing of the scientific advice provision.

STECF is in particular requested to advice on advantages and disadvantages of :

1) establishing a different management year from January-December to April-March
2) establishing different adoption times and different management years for groups of fisheries/stocks

1.2.4 Swordfish Mediterranean fisheries ©

STECF is requested to advise about the suitability of implementing both a minimum landing size and a closed season, with a possible spatial dimension, for the protection of juveniles of swordfish in the Mediterranean (working document section 13 of SGMED report SEC(2002)1374) (part 1 , part 2 , part 3).

STECF is in particular requested to provide:

1) the expected percentage reduction of juveniles catches for the various measures taken separately or in conjunction.
2) the length-weight relationships both for the entire and gutted/gilled specimens.

1.2.5 Data collection. Council Regulation (EC) 1543/2000 (DCR)

1) STECF is requested to agree a written procedure by correspondence for adoption of the future SGRN report " Analysis of 2004 national reports on data collection programs".
2) State of play for the establishment of a Community IT system to query national databases. *Presentation by JRC (I)*
3) Assessing the quality of data collected under the DCR *Presentation by JRC (I)*
4) STECF is requested to identify possible points of poor-functioning of the data collection programs as also implemented at national levels (e.g. under-sampling; over-sampling; poor relationship between the sampling of fishing effort data and catch survey assessment; etc..) and, in particular, to underline the suitability of the Community data collection program to improve the provision of scientific advice for fisheries management. Possible integration or alternative options should be identified. STECF is, in particular, requested to identify and evaluate what feature of the data collection programme have not properly worked to improve the quality of the ICES advice.
5) STECF is requested to organize a roadmap of SGRN meetings to address the revision of the data collection program (surveys; fleet segmentation; Appendixes; etc…) in order improve it and tailoring it with a view of implementing the ecosystem and bio-economic approaches to fisheries management. STECF shall, in particular, revise the following Appendixes:

    i. Fisheries management-Fleet based approach: Appendixes II;III;IV;V;VI;VII;VIII;IX; X; XI;XII;XIII;XV and XVI
    ii. Ecosystem approach: Appendix XIV and identify new candidate parameters to set up a new Appendix
    iii. Bio-economic modelling: Appendixes XVII and XVIII

The work shall be finalized before October 2005. STECF shall agree on the fast written procedure by correspondence to adopt its opinion before the November plenary session. © ®

1.2.6 Economic advice (I)

STECF is invited to evaluate the most appropriate organization framework to deliver an integrated bio-economic advice in 2005 and afterwards.

1.2.7 STECF organization and 2005 Workplan (I)

STECF is requested to

1) fix the date, venues, Chairpersons and invited experts list of the meetings in its 2005 workplan.
2) adopt the terms of reference for each meeting
3) appoint the coordinators of each Sub-Groups
4) evaluate and possibly adopt its rules of procedure

1.2.8 Other matters

(I) Information - © Consultation - ® Reflection

2 Information from the Commission and reflections on improvement of scientific advice

2.1 Briefing from Commission

Mr Biagi informed the Committee on various issues relating both to the functioning of the Committee itself and to the ways the Commission intends to continue supporting the provision of scientific advice in fisheries.

He confirmed that in response to the significant increase in workload for STECF, commencing in January 2005, the Joint Research Centre, Ispra, Italy, had taken over the Secretariat of the STECF. The JRC has is well equipped to facilitate the increasing work of the Committee

Mr Biagi apologized for being unable to arrange interpretation and for the less than ideal meeting room arrangements, explaining that unforeseen events, in particular the huge amount of "competing" meetings resulted in the usual meeting location in Centre Borchette being unavailable.

He informed the Committee that respondents to the Call for proposals for provision of scientific advice (FISH/2004/03) will be informed of the results of the evaluations within a few days. A further call for proposals, with a new rolling programme for scientific advice covering the years 2006 and 2007, should be launched in June 2005, with a likely deadline of September 2005.

From 2007, the implementation of the future Council framework for financial interventions for the implementation of the CFP and the revision of data collection regulation, will result in a more inclusive legal basis to oblige Member States to collect and analyse fisheries data, and provide advice. In this way the European Community will be able to support the provision of timely scientific advice without the need to launch calls for proposals on an annual basis.

The process to adopt a new Commission Decision establishing the STECF has already commenced, and the new framework should be available in the near future. The new decision will include provision for financial support to experts attending STECF, STECF Sub-groups and ad hoc expert working groups meetings. Mr Biagi recalled that in future, members of STECF and expert working group participants will be selected from a register of scientists drawn up in response to the Call for expression of interests FISH/2004/AMI that is available at the following web-site:

http://europa.eu.int/comm/fisheries/news_corner/corner_en.htm.

Mr Biagi encouraged members to publicise this call to potential candidates within the scientific community.

Mr Biagi further recalled that under the new framework, individuals chosen to participate in STECF activities will be contracted to the Commission and will be remunerated on the basis of the number of days in attendance. Payment will be carried out according to the instruction given by each participant. It will be the responsibility of the participant to ensure the financial rules adopted by his/her Member States and research Institute are adhered to in his/her instruction for payment.

The forthcoming Commission Decision establishing the STECF foresees that the STECF adopt a set of rules of procedure in order to further strengthen its working capacity. The Commission will prepare and circulate to the STECF, well in advance of the next plenary session, preliminary draft rules of procedure that can be examined and amended by the Committee for adoption at the plenary session of November 2005.

Until the new STECF is appointed, scientists of the new EU Member States participating in STECF activities attend in the capacity of invited experts.

Mr Biagi recalled that the STECF is an independent advisory body of the Commission and therefore participation in STECF activities is as independent experts and not as Member States' representatives.

With respect to financial support for the provision of the 2005 Annual Economic Report (AER) and to evaluate the economic consequences of the ACFM advice (EIAA model), Mr Biagi recalled that a call for tender to support only the analysis of data was due to be launched imminently. He stressed that the call would be for data analysis only, since the data itself should already be available through the data collection regulation.

In the case, the call for tender may not be published in due time for whatever reason, it would be just a matter to cover the costs of experts preparing and analysing the data with a view of producing the AER and to run the EIAA model. In this latter case, it may be that the same fleet coverage, as ensured by the Concerted Action, may not be attained. Nevertheless both the outcomes of the Call for proposal FISH/2004/03 and the selection of economists following the FISH/2004/AMI may help to ensure that the Institutes and the economists deliver at least part of the AER and to run the EIAA model within an STECF working group.

2.2 STECF Comments.

STECF welcomed the new Secretarial arrangements, noting that the JRC had already taken several useful initiatives regarding communications between itself, the Committee and DG FISH.

The Committee thanked Mr Biagi, for all the tremendous hard work that he had undertaken over the years on behalf of the Committee, noting that despite the ever-increasing workload of STECF, he had successfully managed to combine the successful running of the STECF Secretariat with his other demands within DG FISH. At the same time, the Committee noted the important contribution of several other members of DG FISH, notably Mdm Murielle Hassewer and Mdm Celine Randa in providing secretarial support.

The Committee looks forward to working with the JRC and welcomed the organisational initiatives already put in place.

3 Sandeel fishery

STECF is requested to evaluate and comment on the report of the ad hoc working group on sandeel (08-10 February 2005), paying particular attention on the suitability of the agreed methodology. STECF is also requested to agree on the fast written procedure to adopt its opinion on the strength of the 2004 year-class strength by 10th May.

3.1 Background:

In 2004 based on the most recent estimates of SSB, ICES classified the North Sea sandeel stock as having reduced reproductive capacity. SSB in 2004 was estimated to be at a historic low value (325 000 t). SSB in 2003 was above B_{lim}, but has in 2004 decreased to below B_{lim} due to a historic low recruitment in 2002. In absence of a defined F reference point, the state of the stock cannot be evaluated with regard to sustainable harvest. The fishing mortality in 2003 was slightly below the time-series mean. The 2003 year-class is currently estimated at 570 billion which is little below the long-term average. The 2004 year-class is currently uncertain but particularly important to the state of the stock and the fishery in 2005.
In 2003 the Council of the EU agreed that the Commission should implement a fishing effort regulation for vessels fishing for sandeel in the North Sea and the Skagerrak. A harvest control rule based on size of the incoming year-class was adopted by the EU and STECF was requested to provide an estimation approach to enable implementation of this rule. In 2004 and again in 2005 an Ad Hoc Working Group was convened to prepare a report on the estimation of the incoming year-class and to propose a long term method for estimating the size of the year-class.

3.2 The Harvest Rule

The harvest control rule as agreed by the Fisheries Council in2004 (Council Regulation (EC) No 27/2005):

1) unrestricted: where STECF estimates the size of the incoming year class of North Sea sandeel to be at or above 500 000 million individuals at age 0, no restrictions in kilowatt-days shall apply;
2) limited: where STECF estimates the size of the incoming year class of North Sea sandeel to be between 300 000 and 500 000 million individuals at age 0, the number of kilowatt-days shall not exceed the level in 2003 as calculated in total kilowatt-days;
3) prohibited: where STECF estimates the size of the incoming year class of North Sea sandeel to be below 300 000 million individuals at age 0, fishing with demersal trawl, seine or similar towed gears with a mesh size of less than 16mm shall be prohibited for the remaining of the year.

Note in the original agreement related only to the 2003 year-class however, the rule above has been expressed as a general rule using the term 'incoming year-class' to identify the recruiting 1 group year class.

The analysis carried out by the ad hoc working group, was based on the XSA assessment of sandeel and conditional on a natural mortality of 0.8 and 1.2 for ages 0 and 1 respectively. This resulted in a CPUE based rule on the 2003 year class at age 1.

3.3 Estimation of sandeel year-class strength

In 2004 STECF expressed some concerns about the estimation. In response the Ad Hoc Working Group has proposed an improved year-class estimation method for 2005 with lower probability of overestimating a small incoming year-class. This change in the estimation procedure results in a requirement for a higher CPUE at lower stock size in order to reach the numerical values required to trigger the changes in F given in the HCR. This change should decrease the risk of the sandeel stock falling below B_{lim}.

The Ad Hoc WG report presents the data requirements and monitoring scheme proposed for the 2005 sampling and estimate of the 2004 year-class. The WG indicate it should be possible to have the required estimate of the 2004 year-class strength before the end of the week 1-7 May following data collection to week 24- 30 April. It is therefore hoped to meet the Commission deadline of 10 May for the provision of the estimate of the 2004 year-class.

The report presents what little pertinent information currently available on the 2004 year class, which on the basis of patterns in landings, does not appear to be a very large year-class.

3.4 Implementation of the HCR

STECF considers that the harvest control implementation proposed by the ad hoc working group is an improvement on the previous management regime and an improvement on the model proposed in 2004. For the 2005 fishery the harvest control rule uses a classification model based on CPUE and biological data from age 1 fish, based on data up to 30th April 2005, though one additional week is required to prepare the data and carry out the analysis.

The Ad Hoc WG report provides a short term, deterministic projection model to evaluate the possible effect of the Commission's Harvest Control Rule for 2005 on spawning biomass reference points. This simple analysis indicates that the Commission's Harvest Control Rule appears incompatible with achieving B_{pa} in 2006 except for the cases with above average year-classes. But the Ad Hoc WG proposes an alternative rule that would be compatible with achieving B_{pa} in 2006 given in the text box below. This rule provides a linear progressive change in F compatible with maintaining the estimated SSB at B_{pa} in 2006 for recruitment between 300 and 500 billion. STECF therefore considers that this approach (alternative HCR) would have been more appropriate for 2005.

Table 3-1 alternative harvest control rule for sand-eels

Recruitment age 0 of 2004 year-class	Current HCR	Recommended HCR
R2004 < 300 billion	F mult 2005 = 0.3	F mult 2005 0.3
300 billion < R2004 < 500 billion	F mult 2005 = 1.0	$Fmult_{2005} = (0.00238 * R_{2004}) - 0.34728$
R2004 > 500 billion	Unbounded	$Fmult_{2005} = (-0.00085 * R_{2004}) + 1.61312$

Changes in temporal or spatial distribution of effort might cause the CPUE based implementation of the harvest control rule to give erroneous classification. The CPUE based rule is dependent on the assumption that effort in 2004 should be dispersed in the same manner as in the last 15 years.

3.5 Future Management

STECF considers that the currently agreed methodology (HCR)is not adequate for long-term management of NS sandeels. STECF considers that a revised HCR should be developed and evaluated. The detail of this is discussed below and given in detail in the TOR for the Ad Hoc WG for 2005/6 included in section 7 of this report.

As the fishery relies on the strength of recruiting year class at age 1, STECF considers that within year management is crucial to the sustainable exploitation of this stock. In 2004 STECF stated that it considered that a development of a more permanent harvest control rule should take into account the following:

1) ICES advice concerning spawning biomass reference points
2) the need to avoid local depletion
3) the significance of the sandeel as a prey species in the North Sea
4) continuing updates of any model to account for changes in the deployment of effort

The Ad Hoc WG report indicates that later this year, members of the WG will conduct a more thorough examination of the HCR, incorporating uncertainty and looking at the longer term consequences for North Sea sandeel stock. STECF strongly supports the Ad Hoc WG in this respect and considers that it is essential that further evaluation of the HCR be undertaken, specifically incorporating the uncertainty in the estimation process. In this context it is noted that the current B_{pa} may not be suitable as a biomass trigger in a HCR designed to keep sandeel SSB above B_{lim}. The current value of B_{pa} predates the current management regime which now involves in year estimation of the incoming year-class. The Ad Hoc WG estimates the precision of the incoming year-class at ±50%. B_{pa} is less than 50% greater than B_{lim}. Therefore, the use of the current B_{pa} might result in too great a risk of SSB being below B_{lim}. A stochastic simulation is required to evaluate the use of the current B_{pa} as a trigger value in the HCR based on accuracy of the estimate of the incoming year-class week by week 17. Further details are given in the ToR for the Ad Hoc WG in section 8.7 of this report.

For the longer term STECF notes that the significance of the sandeel as a prey species in the North Sea is not explicitly included in the estimation of B_{lim} and would encourage an evaluation of information on the minimum level of sandeels that would be compatible with the eco-system approach to fisheries management in the North Sea.

3.6 Fast track procedure for 2005

STECF will submit the report on the size of the 2004 year-class from the Ad Hoc WG to JRC during week 18 in 2005. JRC will notify all STECF members once the report is available. The comments by STECF members will be posted on the web site and collated over the next 2 days by STECF Chairman and the Sandeel Coordinator. The agreed report will be supplied to the commission by 10th May.

STECF notes that it is important that the management action resulting from the agreed HCR is then communicated immediately to the fishers as the current HCR assumes immediate management action (by 15 May) in order to operate correctly.

4 Management year(s)

STECF is requested to advise on the most suitable management year(s) for the various fisheries undertaken in ICES area by taking into consideration seasonality, mixed nature of the fisheries and biological characteristics of exploited marine living resources as well as the timing of the scientific advice provision.

STECF is in particular requested to advice on advantages and disadvantages of :

1) *establishing a different management year from January-December to April-March*
2) *establishing different adoption times and different management years for groups of fisheries/stocks*

4.1 stecf remarks

As the problem is one for the whole system of fisheries management, STECF has considered the problem in this fashion rather than just an issue related to the assessment cycle. Three options are given below in order of preference. These descriptions highlight the main possibilities, but should not be considered either as completely comprehensive nor mutually exclusive:

4.1.1 Option 1: Long Term Management Strategy

STECF discussed the traditional, annual, sequence of events leading to the adoption of Council Regulations fixing for the coming year the fishing opportunities for Community fishing vessels. STECF recognises that the demands of this process have increased in recent years, including important and complex decisions on effort management or closed areas, an increasing number of stocks to consider, consultation with stakeholders etc. STECF are of the opinion that the best way forward is to focus debate on the development of adaptive long-term management plans. In this way management decisions will be made on the basis of agreed long-term strategies for the exploitation of the major fish stocks and thereby help avoid anomalous decisions on the basis of short-term political considerations. Such long term plans should be implemented after consultation with Member States and RACs and, by pre-establishing the management rules that correspond to various biological outcomes, remove much of the contentious outcomes of these decisions.

4.1.2 Option 2: Staged Administrative Action

The process leading to the adoption of these Council Regulations is complex, involving:

a) A scientific evaluation of the state of each stock - the 'scientific element' culminating with the ACFM and STECF advice.

b) An administrative phase - consultation with Member States, RACs and other stakeholders, multilateral or bilateral consultations, etc, and culminating with the adoption of a Council Regulation(s).

c) An exploitation phase that, in the main operates on an annual business cycle that requires critical knowledge of fishing opportunities in advance and, for most European countries, this best aligns with the economic year (January to December).

The additional demands now evident in this cycle, largely reside in the administrative phase. STECF is of the opinion that adaptations to the annual cycle described above can be most readily achieved by modifying the administrative timetable to take account of advice available in June and thereby leave *largely* unaltered both the scientific and exploitation phases. STECF is of the opinion that there are only very few stocks with analytical assessments that could be moved from the October to May ACFM. Nevertheless, if this option is considered STECF recommends that ICES be requested to consider ways that would increase the proportion of advise available in the first part of the year (for example completing basic advice on all stocks for which there is currently no analytical assessment, along with those already dealt with in May).

4.1.3 Option 3: Realigned Management Year

This option has two major versions, a) retaining the scientific year January to December, and b) adjusting the science year to align with a new management year.

4.1.3.1 Retaining the scientific year

This strategy would see the administrative phase extend forward into the New Year but would not alter the scientific timetable. This has two important consequences:

1) Assuming the currents scientific timetable is retained, the prediction interval would increase by amount equal to the extension of the administrative phase with a resulting decrease in the quality of that prediction.
2) Similarly the exploitation phase while still operating on an annual cycle would no longer be aligned with the economic year (January to December).

4.1.3.2 Adjusting the science year

An alternative of this strategy would extend forward the administrative phase into the New Year (for example the Council Regulation fixing for the coming year the fishing opportunities for Community fishing vessels would be agreed at the end of March) *and* adjust the scientific phase to align with the new management year.

1) Simply moving forward the entire year (scientific, administrative, and exploitation phases) would not address the increased demands on the process in recent years. Instead, the scientific phase would begin later (reflecting the new management year) but *critically* it would continue to finish at the same time in the autumn thereby allowing an increased interval between the provision of scientific advise and the adoption of appropriate Council Regulation(s).
2) As there would still be a requirement for the completion of national catch databases in advance of any assessment, then either that process could be accelerated or the assessments could take place later (i.e. reduce the time provided for the assessment phase). This strategy would thus see a transfer of additional demand, now evident in the cycle from the administrative phase, to the scientific phase.
3) STECF is of the opinion that Member Sates and ICES could only contemplate such a change after a considerable reorganisation of their traditional timetable for data acquisition and processing. If this option is considered, STECF recommends that ICES be requested to consider the specific biological and administrative implications in detail - this consultation should extend to individual working groups.

4.2 Conclusion

In conclusion, STECF considers that whereas adopting a different management year or different adoption times and different management years for groups of fisheries/stocks (or some combination of the two) are possible alternatives to the current management cycle, the most desirable solution, by far, remains the development of adaptive long-term management plans.

In the shorter term, and recognising that the additional demands now evident in this cycle largely reside in the administrative phase, STECF recommends that ICES be requested to consider ways that would increase the proportion of advice available in the first part of the year, thereby providing a mechanism to reduced the end-of-year workload whilst minimising the impact on the current scientific and exploitation calendar.

Further, STECF considers that the most suitable management year remains the current one (January – December) and that Member Sates and ICES could only contemplate a realigned management year after a considerable reorganisation of their traditional timetable.

5 Mediterranean swordfish fisheries

TECF is requested to advise about the suitability of implementing both a minimum landing size and a closed season, with Sa possible spatial dimension, for the protection of juveniles of swordfish in the Mediterranean (working document section 13 of SGMED report SEC(2002)1374 (part 1, part 2, part 3).

STECF is in particular requested to provide:

1) *the expected percentage reduction of juveniles catches for the various measures taken separately or in conjunction;*
2) *the length-weight relationships both for the entire and gilled/gutted specimens.*

5.1 Background

5.1.1 Distribution

The Mediterranean swordfish is a unit stock, genetically distinguished from the Atlantic stocks. Its distribution is limited to the Mediterranean (and possibly the Black Sea) and the Atlantic areas close to Gibraltar, with very limited exchange with the Atlantic stocks.

5.1.2 Stock Status

Both production modelling and age-based VPA indicated that since 1986, the stock has remained stable with regard to recruitment, total and spawning stock biomass. This was confirmed by the ICCAT stock assessment in 2003. Fishing mortality rates reached a maximum in late 1980s, dropping to a minimum in 1990, after which they increased again to levels observed in the 1980s. Recent F estimate (around 1.0) is unlikely to be sustainable in the long term.

5.1.3 The fishery

According to the current knowledge, most of the EU Mediterranean countries participate in the Mediterranean swordfish fishery. The average catch over the period 1984-2001 was about 14.500 t. Annual mean landings over the period 1997-2001 show that the most important EU countries are Italy with 42%, Greece (12%) and Spain (9%), while Cyprus, France, Malta and Portugal also participate in the fishery. Non-EU countries taking part in the Mediterranean swordfish fishery[1] are Morocco, which accounts for 22% of the landings, Algeria, Tunisia, Libya, Turkey, Japan, Croatia, Albania and Monaco.

For centuries, the Mediterranean swordfish fishery was carried out using driftnets or harpoons, while the use of surface drifting longlines is much more recent, with a broad expansion all over the Mediterranean after the 1960s. The driftnet fishery is has been banned over most of the Mediterranean (from 1st January 2002 in the EC countries and from 2005 for all the ICCAT members), although illegal activity is continuing. The harpoon fishery is limited to a few vessels in the Strait of Messina, while the longline fishery takes place throughout the Mediterranean by most EU countries using various methodologies and fishing techniques.

The longline fishery for swordfish is usually carried out year-round, but mostly from March to November. It is the most important activity in fall and winter and sometimes the only method used at that time. Swordfish are also taken as by-catch in long-line fisheries for tuna and tuna-like species, particularly in the albacore fishery. The highest catches of juvenile swordfish occur between September and December.

5.1.4 Length at maturity and mean length in landings

The estimated size at which 50% of the female swordfish population is mature (L_{50}) is about 142 cm LJFL[2]. Males reach sexual maturity at a smaller size. Variations between gears, areas and years are also known. Mean length in the landings is well below the L_{50} for females. The mean length from Greek landings is reported to be 124 cm LJFL in the Greek longline fishery (varying from 107 to 143 cm) and 111 in the Italian longline fishery (varying from 95 to 112 cm).

[1] The percentages are related to the period 1997-2002, according to the ICCAT report in 2004.
[2] Lower Jaw Fork Length

The low mean length is a reflection of the number of juveniles present in the population, the low size selectivity of pelagic longlines and the high presence of juveniles in the catches from fall to winter (particularly from September to February, with peaks in September to November) although juveniles are present in the catches throughout the year.

5.1.5 Current regulations

A minimum size limit for the Mediterranean swordfish (120 cm LJFL) was adopted by the Council Regulation (EC) 1626/94, which was dropped in 2002 and, at present, no minimum size regulation is in place for this species in the Mediterranean.

Greek national regulations prohibit the use of surface longline between 1st October to 31st January. A minimum landing size of 140 cm (UJFL[3] equal to about 93 cm LJFL) applies in Italy and a minimum landing size of 120 cm LJFL applies in Tunisia.

No TAC regulation applies for the Mediterranean swordfish stock.

5.2 closed season and minimum landing size for Mediterranean swordfish

5.2.1 Incidence of juvenile swordfish in Mediterranean catches.

Juveniles[4] are found throughout the Mediterranean all the year round, but often tend to concentrate in areas of favourable trophic and oceanographic conditions, particularly in autumn, when the 0 age-class aggregate. The spatial distribution of the juveniles varies from year to year. The percentage of juveniles among swordfish landings might vary from 15% to 100%, according to area, month, depth, type of the hook and bait, both in the swordfish fishery or in the albacore fishery[5]. It is quite difficult to properly assess each fishery based on monthly data, because of differences in samplings. In addition monthly landings data are not available in the ICCAT data base for most of the Mediterranean countries. The situation is improving according with the EC Data Collection Regulation. Furthermore, very small swordfish are sometimes discarded at sea, consumed on board or landed sliced and it is quite difficult to assess how landings could represent the real incidence of juveniles on catches. This gives rise to a clear underestimation of juvenile component in the landings and a consequent underestimation of fishing mortality of juveniles in the models used by ICCAT.

The incidence in number of juveniles in the overall swordfish catch in the most productive area in the Mediterranean sea (South Tyrrhenian Sea and Strait of Sicily) from September to December [6], taken as an example, in a mean over the period 2001-2004, is given in table Table 5.2.1.

Table 5-1 Incidence of juvenile swordfish in the catches of the most productive Mediterranean area in South Tyrrhenian Sea and Strait of Sicily from September to December

Hypothetical minimum landing size LJFL	Juvenile estimated swordfish component in landings in the period September-December (number of specimens)		
cm	Size class cm (LJFL)	mean %	limits
110	<110	31.3	23% - 39%
120	<120	53.8	40% - 66.7%
130	<130	70.3	59.9% - 80%
140	<140	81,6	73.3% - 89.4%

5.2.2 The potential effect of the introduction of a minimum landing size and seasonally closed area for EU fisheries

The adoption of a minimum size limit for the Mediterranean swordfish is unlikely to reduce fishing mortality on juveniles, since a reduction in minimum landing size alone will have no effect on the catch of juveniles. On the contrary, a minimum landing size is likely to lead to increased discarding and illegal landings and further deterioration in catch data. Furthermore, enforcement might be ineffective, since several non EU fleets operate

[3] Upper jaw fork length.
[4] For the purpose of this response, "juveniles" are defined as immature fish.
[5] Due to the small size of the hooks used in the albacore fishery, the incidence of juvenile swordfish in catches is particularly high in autumn, as clearly reported in several EC study project.
[6] Landing data for the Southern Tyrrhenian Sea and Strait of Sicily from 2001 to 2004.

in the same area and according to WTO rules in the absence of an internationally agreed common regulation, international trade of juveniles cannot be avoided.

A seasonal closure for the pelagic longline fishery during the period September-December is considered to be a more suitable option to reduce swordfish juvenile fishing mortality. A seasonal closure is practical and is relatively easy to enforce and control. The length of the closure and the fishery in question should be determined depending on the reduction in juvenile catch required. The greatest reductions in mortality would occur if a closure were to be implemented towards the beginning of the period.
A seasonal closure, especially during the fall, would also be expected to reduce the catch of juveniles of other large pelagic species. However, seasonal closures are also likely to reduce the overall catch of adult swordfish and of other commercial and non-commercial species to varying degrees. An estimate of the overall effects of closures over the period September to December on the catch in weight of swordfish and albacore are given in Table 5-2

Table 5-2 Indicative percentage landing by weight by month in 2003 of swordfish estimated from the swordfish fishery in the Southern Tyrrhenian and the Strait of Sicily. This fishery, which is the most important Mediterranean swordfish fishery, is used as an example. Cumulative percentage reductions are for consecutive periods starting at the beginning of September

Month	Swordfish landings		Albacore landings	
	% predicted lost	Cumulative % predicted lost	% predicted lost	Cumulative % predicted lost
September	9	9	5	5
October	7	16	13	18
November	6	22	8	26
December	1	23	2	28

Although Table 5-2 is only indicative and the seasonal nature of the fishery may vary considerably, STECF nevertheless agrees with ICCAT, that the effects of a closure of less than 2-months duration is likely to have only a marginal effect on the fishing mortality of juveniles.

However, largely because of a lack of reliable data on the catches from the fishery (reported to ICCAT), STECF is unable to provide a precise prediction of the potential impact of a seasonal closure (with or without a minimum landing size). However STECF considers that a fully enforced seasonal closure of at least 2 months (with or without 110 cm LJFL minimum size), should result in a overall reduction in swordfish landings.

STECF also points out that the choice of season should take into account the overall economic effects on the albacore fishery.

5.2.3 STECF conclusions and recommendations

Assuming effort is not allowed to increase at other times of the year, STECF recommends that the adoption and the implementation of a seasonal closure for the pelagic longline fishery in the Mediterranean (including longline sport fishing) during the period September-December would be an effective way to reduce fishing mortality on juvenile swordfish. Such a measure should be relatively easy to enforce and control. A seasonal closure would also reduce the fishing mortality on adult swordfish and on other commercial and non-commercial species to varying degrees. This recommendation is further qualified by the comments below:

1) STECF agrees with ICCAT that the effects of a closure of less than 2-months duration is likely to have a marginal effect on the fishing mortality of juveniles.
2) STECF recognizes that the implementation of a minimum landing size alone will have no effect on catches or juvenile fishing mortality for Mediterranean swordfish. STECF notes the difficulties in implementing the minimum size regulation for this species, and the fact that a minimum size regulation may result in a general deterioration in data quality and an increase in discards.
3) A combined seasonal closure and minimum landing size regulation is unlikely to lead to any greater reduction in catches or fishing mortality on juvenile swordfish compared to a closure alone.
4) STECF recommends that GFCM and ICCAT should be involved in the process to adopt common rules for the management of Mediterranean swordfish fisheries.

5.3 Length-weight relationships

5.3.1 Current estimates

The growth equations adopted by the GFCM/ICCAT Working Group in 1995 and used for the ICCAT Mediterranean swordfish stock assessment in 2003 are those published by Tserpes and Tsimenides (1995) and still used as follows:

$L_{inf} = 238.60 (1 – e^{–0.185 (t + 1.404)})$ for sexes combined
$L_{inf} = 203.08 (1 – e^{–0.241 (t + 1.205)})$ for males
$L_{inf} = 226.53 (1 – e^{–0.210 (t + 1.165)})$ for females.

According to these parameters, the predicted length at age is as follows:

Table 5-3 age-length relationship for Mediterranean swordfish

AGE	MALES (cm)	FEMALES (cm)
1	83	82
2	109	110
3	129	132
4	145	149
5	158	165
6	167	176
7	175	186
8	181	194
9	186	200

Swordfish usually exhibit sexual dimorphism (females are bigger than males) and since most fish are landed gutted, it is not straightforward to estimate realistic length-whole (round) weight relationship. The current conversion from gilled and gutted weight (GWT) to round weight (RWT) for Mediterranean swordfish as used by ICCAT is as follows:

$$GWT \times 1.33333 = RWT$$

This general conversion factor does not consider variations by age, sex or physiological status of each animal.

Several authors have proposed length-weight relationships that allow estimates of various weight forms (gilled-gutted, round, etc) from lower jaw-fork length (LJFL) measurements (De Metrio et al., 1987, cited in ICCAT 1990; Tsimenides and Tserpes, 1989; Mejuto and de la Serna, 1993; De la Serna et al.,1995; Hattour, 1996; Orsi-Relini et al., 1999; Alicli and Oray, 2001; Tserpes et al., 2003).

Currently, the ICCAT is still using the length-weight relationship proposed by De Metrio et al, 1990, that was based on a limited sampling, which is the following:

$$GWT = 5.701 \times 10^{-6} \times LJ\text{-}F^{3.16}.$$

The results of the most recent study work by Tserpes et al. (2003), based on 24,668 specimens, are compared with those of De Metrio et al (1990) in Figure 5.3.1. parameter estimates from Tserpes et al, (2003), are given in Table 5-4 and plots of various fitted length weight relationships are given in Figure 5.1.

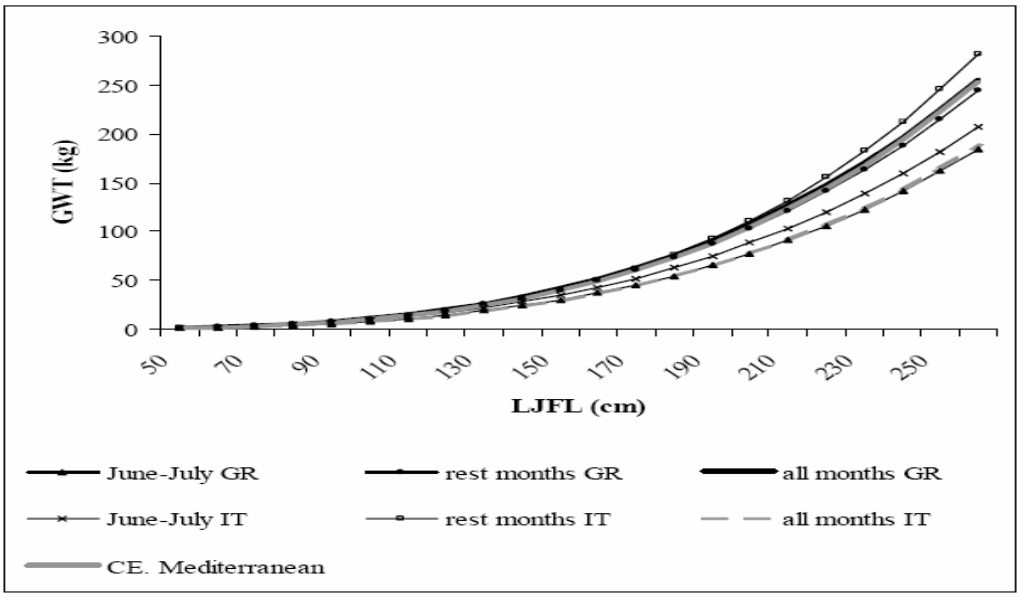

Figure 5.1 Graphical plots of the estimated LJFL-GWT relationships for the swordfish from Central and Eastern Mediterranean Sea.

Table 5-4 Coefficients of the general equation used (GWT=a LJFL^b) for predicting swordfish gilled and gutted weight (GWT kg) to lower jaw fork length (LJFL cm) for the central and Eastern Mediterranean Sea (Tserpes *et al*., 2003).

Area	*Sample size (n)*	*Length range (cm)*	R^2	*a*	*b*
Central-Eastern Mediterranean	24668	50-248	0.92	$1.76x10^{-6}$	3.338
Italian fleet (C. Med.) All months	16086	61-248	0.91	$1x10^{-6}$	3.427
Italian fleet (C. Med.) June-July	11183	70-248	0.89	$3x10^{-6}$	3.246
Italian fleet (C. Med.) Rest months	4903	61-229	0.90	$7x10^{-7}$	3.563
Greek fleet (E. Med.) All months	8719	50-243	0.94	$3x10^{-6}$	3.284
Greek fleet (E. Med.) June-July	2993	63-243	0.94	$2x10^{-6}$	3.298
Greek fleet (E. Med.) Rest months	5726	50-242	0.94	$3x10^{-6}$	3.276

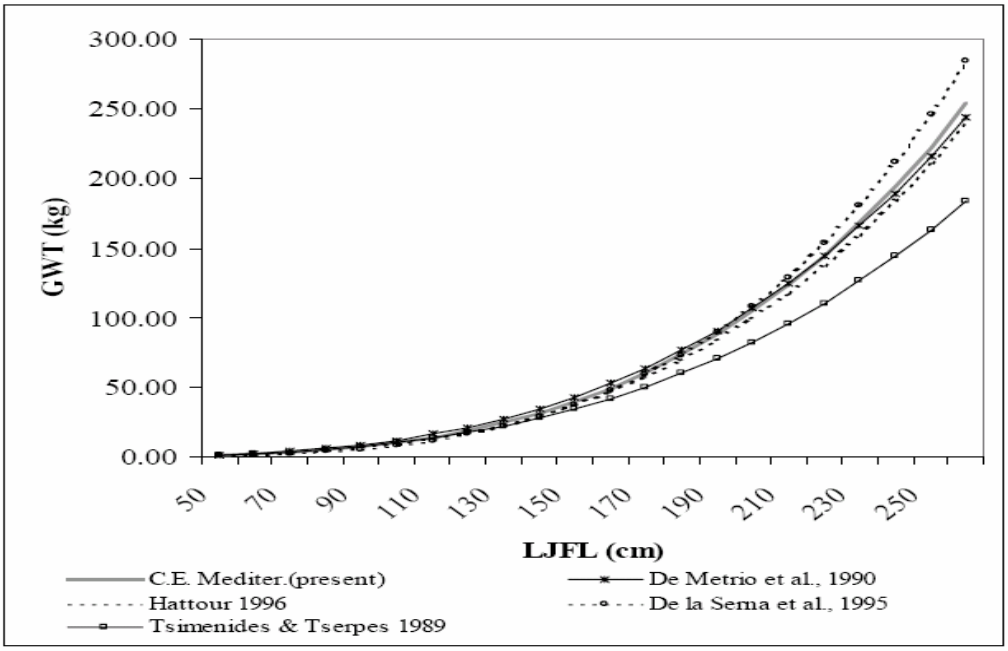

Figure 5.2 LJFL-GWT relationships for Mediterranean swordfish based on the results of various studies.

Table 5-5 shows the results of numerous other studies on the length weight relationship for Mediterranean swordfish.

Table 5-5. Length-weight relationships for Mediterranean swordfish from various studies

year	area	gear	Length-weight relationship	sex	Sample no.	Source-see footnote
2002	Tyrrhenian Sea	LL	y = 0,3248e0,0316x	males	55	1
2002	Tyrrhenian Sea	LL	y = 0,3153e0,0332x	females	119	1
2002	Tyrrhenian Sea	LL	y = 0,4639e0,0295x	n.d.	299	1
2002	Strait of Sicily	LL	Y = 0,3256e0,032x	males	147	1
2002	Strait of Sicily	LL	y = 0,6573e0,0276x	females	146	1
2002	Strait of Sicily	LL	Y = 0,743e0,0257x	n.d.	20	1
2003	C. Tyrrhenian Sea	GILL	Y = 1E-06x3,4768	sex combined	1363	1
2003	S. Tyrrhenian Sea	GILL	Y = 7E-07x3,5697	sex combined	860	1
2003	S. Tyrrhenian Sea	LL	Y = 7E-07x3,5635	sex combined	25	1
2003	S. Tyrrhenian Sea	HARP	Y = 1E-06x3,5191	sex combined	446	1
2003	Strait of Sicily	LL	small sample	sex combined	20	1
2004	Strait of Sicily	LL	Y = 4E-06x3,1931	sex combined	1014	1
2004	S. Tyrrhenian Sea	GILL	Y = 6E-07x3,5844	sex combined	575	1
2004	S. Tyrrhenian Sea	LL	Y = 7E-07x3,5635	sex combined	46	1
2004	S. Tyrrhenian Sea	HARP	Y = 2E-06x3,3588	sex combined	77	1
2004	C. Tyrrhenian Sea	GILL	Y = 3E-06x3,2651	sex combined	1266	1
2004	C. Tyrrhenian Sea	LL	y = 1E-06x3,441	sex combined	278	1
1998	Tanger (Morocco)	GILL	GWT= 1.4677E-06 LJFL $^{3.4213}$	sex combined	575	2
1999	Tanger	GILL	GWT= 1.2300E-06 LJFL	sex	390	2

	(Morocco)		3.4556	combined		
2000	Tanger (Morocco)	GILL	GWT= 3.6295E-06 LJFL 3.2627	sex combined	1342	2
2001	Tanger (Morocco)	GILL	GWT= 1.6056E-06 LJFL 3.8709	sex combined	751	2
2002	Tanger (Morocco)	GILL	GWT= 1.1316E-06 LJFL 3.4894	sex combined	307	2
2003	Tanger (Morocco)	GILL	GWT= 1.6590E-06 LJFL 3.4260	sex combined	778	2
1998	Nador (Morocco)	GILL	RWT= 4.5145E-06 LJFL 3.1996	sex combined	98	2
1999	Nador (Morocco)	GILL	RWT= 1.7669E-06 LJFL 3.3974	sex combined	186	2
2000	Nador (Morocco)	GILL	RWT= 1.1690E-06 LJFL 3.4959	sex combined	75	2
2001	Nador (Morocco)	GILL	RWT= 9.5857E-06 LJFL 3.0424	sex combined	54	2
2002	Nador (Morocco)	GILL	RWT= 9.0011E-06 LJFL 3.0689	sex combined	184	2
2003	Nador (Morocco)	GILL	RWT= 1.6551E-06 LJFL 3.4254	sex combined	91	2
2000	Tunisia	LL	GWT= 6.0000E-05 LJFL 3.5275	sex combined	n.d.	2
2001	Tunisia	LL	GWT= 2.7285E-05 LJFL 2.7929	sex combined	284	2
2003	Malta	LL	GWT= 3.5434E-05 LJFL 2.7708	sex combined	125	2
2004	Malta	LL	GWT= 3.7719E-05 LJFL 2.7474	sex combined	24	2
comb.	Malta	LL	GWT= 3.2124E-05 LJFL 2.7906	sex combined	149	2
1994	W. Mediterranean	LL	GWT= 3.4459E-07 LJFL 3.6920	sex combined	n.d.	3
1992	W. Mediterranean	LL	RWT= 8.905E-07 LJFL 3.555	sex combined	n.d.	4

Note: Source: 1) Aquastudio, unpublished data; 2) CopeMed, unpublished data; 3) de la Serna *et al*., 1995; 4) Mejuto & de la Serna, 1993.

The recent enforcement of the EC Data Collection regulation should provided the opportunity to produce up-to-date estimates of the length-weight relationship for Mediterranean swordfish.

5.3.2 STECF conclusions and recommendations

1) STECF recommends that the length-weight relationship used for the Mediterranean stock assessment by ICCAT in 2003 should be used as a reference, until a more updated version becomes available.
2) STECF recommends that both GFCM and ICCAT should be involved in processing the data to determine a common length-weight relationship for the Mediterranean swordfish, taking into account the data that have been collected under the EU Data Collection Regulation.

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6 Data collection. Council Regulation (EC) 1543/2000 (DCR)

stecf is requested to agree on a written procedure by correspondence for adoption of the future sgrn report "analyis of 2004 national reports on data collection programs".

6.1 Background.

The SGRN sub-group is scheduled to meet from 25-29 June 2005, since this is the earliest date that the national reports will be available for scrutiny by SGRN. The opinion of STECF on the national reports on data collection is required by the Commission before 31 July. Hence there is a need for the STECF to comment and adopt the report of SGRN by correspondence before 31 July.

6.2 Procedure agreed by STECF.

The Chairman of the SGRN sub-group meeting to Analyse the 2004 national reports on data collection programs will deliver the report of the meeting to the Commission and the STECF membership by 5 July. The version of the report submitted to the STECF membership shall have highlighted, those sections of the report that in the opinion of the SGRN should be given particular attention by the STECF. The SGRN Co-ordinator (Dr Mark Dickey-Collas) will co-ordinate the STECF response to the report and provide a draft STECF response for circulation to the members of STECF by 10 July. Members will be required to relay comments to the co-ordinator by 12 July will revise the STECF response according to comments received and deliver the final STECF response to the Commission before 31 July.

6.3 State of play for the establishment of a Community IT system to query national databases.

The Commission is developing a system to query national databases. The DCONT software was written to facilitate the transfer of information between Member States and the Commission. It is custom software installed in DG FISH and linked to the existing FIDES (Fisheries Data Exchange System). DCONT is XML-enabled, i.e. it can be used to:

1) create data requests in the form of XML Schema files that define the structure and the format of the data that are expected to be sent;
2) receive data in XML files that match the XML Schema definition and save them in a database.

An essential component of the system is the Codification Standards Document (CSD), which was written to define the naming conventions (codes) for the fisheries parameters referred to in the regulation. EC1639/2001. These codes are used to describe the data sent in the Schemas and to be received in the XML files.

On 15 November 2004 the Commission (DG FISH) launched the Control Exercise 2002-2003, the first attempt to retrieve and evaluate data collected by the Member States during the period 2002-2003. Enlargement countries did not participate in the exercise, as the data collection regulation EC 1639/2001 became effective after the 1st of May 2004 in the new Member States. Thirteen Member States from the EU15 participated, namely BE, DK, FI, FR, DE, GR, IE, IT, NL, PT, ES, SE, UK. The data request concerned the Modules C, D, E, F, H and I of the regulation EC 1639/2001 and was sent via e-mail to the Member States' National Correspondents in two forms:

1) as a document written in natural language; and
2) in XML format, namely as a set of XML Schemas.

During the Control Exercise, a total number of 7 out of 13 participating Member States sent the data in XML format using the CSD codes. However, the attempt to use DCONT and FIDES to process the data failed. All 13 Member States sent their answers to the Commission by e-mail. JRC then carried out a study to assess the quality of the data. The data was transferred to a database using ad-hoc procedures.

6.4 Assessing the quality of data collected under the data collection regulation (Council regulation (EC) 1543/2000)

An evaluation of the quality of data collected under the data collection regulation in 2002 and 2003 was undertaken by the Joint Research Centre (JRC IPSC/G03/R/ISH/ish D(2005)(4046)). The main findings were presented to STECF and are summarized below.

6.4.1 Summary of conclusions of the JRC study on data quality

Discrepancies were observed in the codification, disaggregation, measurement units and precision levels used by the Member States. Anomalies identified in the data resulted in biologically unlikely results, such as maturity that drops with age or unrealistic Von Bertalanffy growth curves. Many instances of missing data and incomplete answers were identified, especially with regard to CPUE and discard data. However, there are many plausible reasons that could explain these deficiencies, such as derogations acquired or differences in the fisheries concerned. However, no attempt to identify the cause of such discrepancies was considered in the JRC evaluation.

The whole process needs to be automated in order to speed up the data exchange and analyses and minimize errors caused by manual data handling. JRC is beginning a pilot project in collaboration with the Member States to that end. The use of the Codification Standards Document (CSD) and the XML format needs to be compulsory in order to increase homogeneity in the data and facilitate the quality assessment. However, the CSD is still incomplete. Furthermore the structure is not entirely logical. JRC will produce a revised version in an attempt to eliminate current errors, improve the definition of the parameters inline with the provisions of the DCR and include guidelines on how to flag derogations. The graphical outputs used to evaluate the data quality were highly effective at visualizing and identifying the problematic areas. Specific outputs need to be defined for each parameter referred to in the DCR, based on the needs of the scientists. Furthermore, defining the acceptable range for the parameter values would allow the development of compliance indicators to indicate strange behaviour.

6.4.2 STECF comments.

STECF welcomed the presentation of the evaluation carried out by the JRC and agreed with its findings, noting that such screening was highly effective at indicating data and parameters that should be closely scrutinized to explain observed discrepancies and outliers. STECF considers that the way the results are presented provides a useful summary of the data collected and that continued screening in the future has the potential to be very useful in identifying errors and inconsistencies in the data submitted under the DCR and should be encouraged.

To assist and improve future analyses, **STECF recommends** that JRC prepare the following documents:

1) A draft definition of the graphical outputs that will be used to visualise each of the parameters referred to in the DCR (standard outputs) and the acceptable range of values for each parameter,
2) A revised version of the CSD that will correct the current errors and better reflect the requirements of the DCR

Additionally that SGRN provides advise on the two drafts during the next SGRN meeting in June 2005. Provisions should be taken to extend the duration of the meeting for two more days in order to enable SGRN to deal with the extra workload. Eventually, the provisions of these documents should be put into practice by the Regional Coordination Meetings.

6.5 Problems with the current Data Collection Regulation.

STECF was requested to identify possible points of "poor-functioning" of the data collection programme as implemented at national level. The problems identified in the 19th report of STECF (SEC 2005/369) regarding economic issues have subsequently been addressed by the commission and are thus not included here.

6.5.1 Unbiased Sampling of fishing fleets

STECF notes that many sampling and observer programmes within member states rely on the invitation of vessel owners and skippers to join fishing trips. This results in a biased coverage of the fleets and incomplete coverage of many segments of the catch. STECF considers that a certain degree of legal obligation on vessels to provide access to scientists collecting data and observing fishing behaviour is required to allow unbiased collection of data. In conformity with Article 22 of the

Common Fisheries Policy (Council regulation (EC) no. 2371/2002) the obligation to take observers should be incorporated as a legal requirement into the DCR.

6.5.2 Availability of collected data to assessment groups

The current DCR does not oblige member states to make collected data available to appropriate working groups to assist in the provision of fisheries advice. Data are being collected and not provided, despite requests for the data from working groups.

6.5.3 Harmonisation of discard and market sampling schemes

Data from different Member States discard and market sampling programs is often combined for use in assessment. Data collected by one MS from vessels of another MS landing in a foreign port needs to follow the sampling scheme of the Flag state to be full utilised. Harmonisation of sampling methodology would deliver considerable benefits, allowing more flexibility in the use of data and simplifying the calculation of sampling precision. The commission should consider including a requirement to agree and implement common sampling schemes for similar data.

6.5.4 Harmonisation of DCR and legal control measures

STECF notes that the definition of fleet segmentations in the framework of the data collection programme is inconsistent with the regulations of fishing possibilities. The harmonisation of the fleet segmentation with current regulations of fishing possibilities is crucial for any analyses of their effects, e.g. regulations on effort control in the North Sea are based on days at sea (days away from port) for certain area and gear combinations while under the DCR the data are collected on days of active fishing.

6.5.5 Coordination of Surveys

Although several surveys are included in the current data regulation as regionally coordinated surveys, there are different gears and procedures used in different parts of the regions covered. While there may be good scientific reasons for some changes around the areas covered, the survey coordination needs to include collection of data to allow 'vessel' or 'gear' effects to be separated from area effects. This might involve some interlace of survey effort or routine inter-calibration. Without such harmonisation these regional surveys cannot be considered as regionally coordinated. The requirement to include full harmonisation should be considered as a requirement under the regulation.

6.6 Terms of reference for the SGRN meetings on the Data Collection regulation (DCR) revision.

STECF was requested to organize a plan of SGRN meetings to address the revision of the data collection program and advise on suitable terms of reference (TORs) for meetings that may be required. STECF considered that 3 meetings were required to cover technical and biological data requirements, the ecosystem approach and the economic data requirements for fisheries management.

The data collected in DCR is mainly used as input data for stock assessment models. The broader object is for management advice. In general terms of the stock assessments, the role of data is to decrease the uncertainty of the models, and to replace assumptions to the extent that is possible. Total catch data and sampling of age structure of total catches is used to estimate population size, and exploitation rates. The smaller is the CV of the input data, the more exact estimates the models will produce.

Therefore, the fisheries models can be used to evaluate the relative impacts of improvements of each data source in decreasing the CV's (uncertainties) of model estimates. A systematic analysis of the input data would enable the Commission and member country scientists to better justify the use and division of resources inside of the DCR.

The ongoing EU projects EFIMAS and COMMIT will provide software tools that enable a systematic analysis. Even though these tools are not yet available, STECF recommends, that the items above are taken into account, when considering the definitions of the revised DCR.

In the following paragraphs, STECF provides general aims for the revision of the DCR and specific terms of reference for the 3 proposed meetings.

6.6.1 General Aims of the Data Collection Regulation (DCR) revision

In consultation with the commission, STECF has identified the following general aims of the revision:

1) Simplify the system
2) Increase quality and validation of the data used in fisheries management

3) Improve and manage access to the data (with links with the Regional Fisheries Organisations e.g. ICCAT, NEAF, GFCM etc)
4) Implement regional planning and execution of DCR of Member States through Regional Coordination Meetings
5) Harmonise data collection and analysis methodologies across member states
6) Ensure that the segmentation used in both the biological and economic data collection programmes is compatible, so that data from both schemes can be compared at the lowest possible aggregation.
7) Ensure that submissions to the evaluation process are of uniform quality across the member states and that standard templates are used.
8) Ensure that any data collected by a member state is recorded in the member states database at the lowest possible level of aggregation. Member states should be able to extract the data at any level of aggregation. The JRC database should be designed to receive and manipulate these data at appropriate levels of aggregation.
9) Incorporate the requirements for data collection, collation, quality control, and analysis, to provide appropriate data to scientific meetings convened to undertake assessment and evaluations of proposed and implemented management measures.

6.6.2 Proposed Meetings and terms of reference

A series of three meetings is proposed:

6.6.2.1 Technical and biological data requirements for Fisheries management

This meeting will review and advise on changes to the appendices of the DCR. It should draw, amongst others, on the reports of STECF- SGRN and the findings of the Workshops on the definition of métiers (Nantes, May 2005) and on small-scale fisheries (Kavala, date to be decided).

The terms of reference are:

1) Review the utility of the current scheme of minimum and extended programmes.
2) Review whether the data address the specific needs of the current assessment and advisory process, particularly mixed fisheries and fleet based analysis e.g. fleet segmentation, level of desegregation, sampling level, etc.
3) Comment on the necessity to maintain all parameters requested by the present regulation. (e.g. growth, maturity, fecundity, sex-ratio) and check that all the needs related to the collection of the biological parameters are covered.
4) Define the data fields/parameters that need to be collected to provide fisheries management advice. This should cover landings, discards, vessels, the characteristics and dynamics of fisheries and regulatory management measures.
5) Review the required level of precision for the parameters to be estimated, and whether these should be applied at the national, stock or other level.
6) Define level of aggregation in data collection to meet the scientific requirements of client organisations.
7) Propose simplifications to the DRC and appendices by reducing the number of appendices and checking for cross-appendix inconsistencies and contradictions.
8) Indicate if the current criteria to prioritise the surveys (including tagging) are still valid and if necessary propose amendments to them, considering the needs of stock assessment, spatial management, provision of advice and the ecosystem approach to fisheries management.
9) Suggest changes or inclusion to the existing list of priority 1 and priority 2 surveys, based in the conclusion of the previous TOR.

6.6.2.2 Ecosystem approach and the use of surveys in Fisheries management

While the European Commission, ICES and other groups continue to advance our understanding of an integrated ecosystem approach to fisheries management, a precise definition of the data requirements, as yet, remains elusive. The development of the European Marine Strategy will aid this process. Currently, in absence of clear guidelines for immediate needs, STECF considers that the ecosystem approach should focus on impact of fisheries on the ecosystem. STECF notes that there will be many data that will prove necessary to an ecosystem approach in the future. However, it is premature to include them at present in the DCR as the eco-

quality indicators are not yet defined. As a provisional move STECF considers that data could be collected to provide information on the following:

1 The spatial and temporal distribution of different fishing activities.
2 Trends in fish assemblages.
3 Impact of fishing on species that are intentionally exploited and on unintended bycatch.
4 Genetic erosion of commercial wild stocks.

While these will address the current data requirement for the performance indicators for the greening effect of the CFP as identified in SEC 2004 (29) *Ad hoc expert group on indicators of environmental integration for the CFP* (Brussels Oct 2003), STECF is of the opinion that the evolution of a ecosystem approach will only occur incrementally over time. It is probable that the sampled variables will change with time. Thus STECF considers that the requirements of the DCR will, likewise, require ongoing adjustment as new information, understanding and methodologies emerge.

The terms of reference are:

1) Based on the above-mentioned list and documents, and any additional information from the Commission, propose if possible, a short, prioritised list of eco-quality indicators (EQI) by region, that can be clearly established as appropriate for ecosystem approach to fisheries management. The specified region should conform to those in the current DCR.
2) Propose a priority list of species (or groupings of marine organisms) to be included in the DCR and clearly explain the criteria for prioritisation.
3) Identify the data required to support these EQIs. Establish the suitability of currently collected data to address these indicators and identify data collected through other existing regulations and programmes (e.g. Research Vessel surveys, small cetaceans regulation etc.)
4) Where suitable data are not currently being collected, identify what data should be collected.
5) In light of TORs 1 to 4, define the data and its sampling requirements (data base fields and descriptions for the Joint Research Centre (JRC), spatial and temporal resolution, accuracy requirements). The sampling intensity and accuracy should be sufficient to resolve changes in the ecosystem that are relevant for management.

6.6.2.3 C. Economic data requirements for Fisheries Management

The meeting should review and propose changes in DCR for economic data. The sub-group should note the STECF review and comments in 19th report of STECF in November 2004 on the SGECA report on Data collection and economic indicators(SEC 2005/369) and take into account the findings and recommendations of the forthcoming SGECA meeting scheduled for May /June 2005.

The terms of reference are:

1) Review and evaluate the economic indicators presented in 19th report of STECF, SGECA report on Data collection and economic indicators. Including the definitions of capital costs and employment. Account must be taken in particular of the definitions of capital costs and employment.
2) Define the target population of fleets (e.g. active/non-active vessels, those in the fleet register etc see STECF report).
3) Evaluate the appropriateness of the fleet segmentation in the National Programs and ensure that the segmentation used in both the economic and biological data collection programmes is compatible.
4) Reliability- Propose alternative methods to evaluate the quality and precision of the data
5) Availability of data and timing- Review the need and recommend a suitable time scale for data submission.
6) Evaluate the necessity of data collection for processing industry and aquaculture (section K of DCR) and revise the list of parameters to improve the data collection if needed.

7 Economic advice

STECF is invited to evaluate the most appropriate organization framework to deliver an integrated bio-economic advice in 2005 and afterwards.

7.1 Introduction

The STECF has three main responsibilities on economic matters:

1) assessment of the overall performance of EU fisheries;
2) predictions of the economic impact of the EU fisheries management decisions;
3) answering specific questions on the economic impact of management advice.

The aim of the following sections is to emphasise issues, which are relevant for fulfilment of the STECF´s resposibility in the short term (2005) and in the long term (2006 and onwards)

7.2 Economic advice in 2005

The Commission informed the STECF that it has the intention to immediately publish a call for tender with the Terms of Reference covering the compilation, analysis and publication for the AER (Annual Economic Report) as well the work connected to the EIAA (Economic Interpretation of ACFM Advice). The costs for the collection of data will not be covered as information will be supplied through the Data Collection Regulation that is partly financed by the EU. The Commission indicated that the Contractor should have all the information necessary for the running of the EIAA model ready at the end of September in order for the STECF to draw the analytical conclusions.

The Annual Economic Reports are the only global overview of the economic performance of the EU fisheries and the only basis for estimating the impact of changes in the EU regulations.

The STECF welcomed the initiative of the Commission, but stressed the urgency and that a delay in the start of the Contractors work will jeopardize the economic advice for 2005. As was reported by the STECF in November 2004 many stocks are in a critical situation and many fleet segments have significant economic problems. STECF considers that a continuation of the economic assessment of the ACFM advice is a priority for the provision of pertinent management advice, and that a failure to do so in 2005 may compromise the decision-making process.

STECF welcomes the intention of the Joint Research Center to support the running of the model and anaysis of the data.

7.3 Economic advice from 2006 onward

Assessment of the economic state of Europe's fisheries and prediction of the impact of proposed management measures should be put on the same regular institutional basis as that for biological advice. The STECF believe that the SGECA sub-group, the involvement of the JRC and the new financial mechanisms for payment of institutions and individuals provide the building blocks of a future system. In setting up the system we need to consider the following issues:

1) The objective of the bio-economic advice
2) Types of models and format of advice
3) Relevant research projects (EU funded projects, national projects and 3rd country projects)
4) Data sources, types of data and availability
5) Organisational framework for the economic advice

1) With reference to issue number one the objectives of the Concerted Action Economic Assessment of European fisheries was: To assess economic consequences of TAC/quotas for selected fleet segments in the fishing fleet of the European Communities, the methodology and the type of model that is used for the Economic Interpretation of the ACFM Advice. The objective was based on the current fish stock assessments and the subsequent TAC proposal carried out mainly by ICES. For a number of regions, however, fisheries are managed by effort regulation, but still there is a need for bio-economic advice. Therefore it is useful to address 1) the appropriate TAC based bio-economic advice, 2) what should form the basis where no stock assessment is available, and 3) what output in terms of bio-economic indicator is deemed important as basis for the advice and what should be the format of the advice output?

2) The types of models derived from the objectives need clarification. In multi-species, multi-fleet bio-economic models the scope of the models needs to be determined, as well as the model structure including the causality of the models. It is questionable whether one single model can handle all kinds of questions. At least three categories of models seem relevant: 1) output-driven models (exogenous output and endogenous inputs) 2) effort-driven models (exogenous inputs and endogenous output) and 3) integrated models where causality shifts. For all three categories of model, the appropriate methodology may be either simulation modelling or optimisation modelling. It is mandatory that the models in question are operational with respect to the objectives and available data.
3) An identification of relevant, completed and on-going, research projects comprising bio-economic modeling could help to avoid overlapping work and increase communication. The scope of these projects and the time schedule should be examined. Relevant projects carried out in 3rd countries should also be examined.
4) Operational models require data. The data process includes 1) collection of data, 2) provision of data, and 3) organisation and adaptation of data to fit the models. Therefore a review of the type of data is needed and the availability of the data in time is imperative for the advice. The way data is organised needs attention as well as assessing if any changes and facilitations are required including e.g. segmentation of the fleet, information of catch composition and cost and earnings. The model-data relationship is in some degree interactive.
5) Organisational framework. Good advice needs to be trustworthy and presented in away that is useful and understandable. Therefore the procedure and the human resources that transform information into good advice are important to address. Data need processing and as data are fed into bio-economic models the understanding of the models, the operating skills and the capability of interpreting the results are imperative for good advice. Therefore the criteria that form the basis for this procedure in terms of the required human resources and institutional framework need to be laid down as sustainable basis for the future work.

STECF proposes that the evaluation of the above-mentioned issues is referred to a joint SGRST-SGECA subgroup meeting. The draft terms of reference for the subgroup meeting is given in section 8.1.1.

8 STECF organization and 2005 work plan

STECF is requested to

1) *fix the date, venues, Chairpersons and invited experts list of the meetings in its 2005 workplan.*
2) *adopt the terms of reference for each meeting*
3) *appoint the coordinators of each Sub-Groups*

Draft terms of reference for each of the planned STECF Sub-group meetings is given below. The current list of planned meetings and associated relevant information, all of which is subject to change, can be found at the following address

http://stecf.jrc.cec.eu.int/

Meetings are identified by unique number and year by sub-group e.g. SGRST 05-01. This web-site is maintained by the STECF Secretariat.

8.1 combined meeting of biologist and economists on bio-economic modelling (SGRST/SGECA 05-01).

Date: To be decided
Venue: To be decided
Chair: To be decided

8.1.1 Objective of the bio-economic advice.

In recent years the objective of the bio-economic advice has primarily been based on the fish stock assessments and subsequent TAC proposals. These assessments are not available for all European regions. The group is asked to:

1) Critically review the objectives of the bio-economic advice as it has been carried out in the CA and give adjusted objectives.
2) Set out objectives for the bio-economic advice in case no stock assessments are available.
3) Make a set of important bio-economic indicators that could be used as the basis of the advice.

8.1.2 Types of models used.

At least three categories of models seem relevant: 1) output-driven models (exogenous output and endogenous inputs) 2) effort-driven models (exogenous inputs and endogenous output) and 3) integrated models where causality shifts. For all three categories of model, the appropriate methodology may be either simulation modelling or optimisation modelling. It is mandatory that the models in question are operational with respect to the objectives and available data. The group is asked to:

1) determine the scope of the models within a multi-species, multi-fleet bio economic context,
2) advise on suitable operational models that can be used,
3) consider overall data requirements of the models, including availability in time.

In selecting models, the group should take into account the practicalities of collecting the required data.

8.1.3 rlevant projects

In order to avoid duplication, the group is asked to:

1) list relevant concluded and on-going research projects comprising bio-economic modelling inside and outside the EU,
2) examine the scope and the time schedule of these projects,
3) explore research needs to develop new models.

8.1.4 Data requirements

In order to run the models data are needed. The groups is asked to assess:

1) the type of data needed for the operational models:
    a. Variables needed
    b. Aggregation levels of the data (segmentation)
2) the procedures for organisation and adaptation of the data to fit the models
3) sources of data.

8.1.5 adustments data regulation

The group is asked to eflect on the consistency between the data needs for the bio economic models and the data provided by the data regulation and to list discrepancies and advice on changes. The meeting should produce input for the SGRN meeting on bio-economic modelling scheduled for October (SGRN 05-04).

8.1.6 Advice procedures and organisational framework

Good advice needs to be trustworthy and presented in a way that is useful and understandable. Thus, the procedure and the human resources that transform information into good advice are important to address. The group is asked to provide criteria that form the basis for this procedure in terms of the required human resources and institutional framework.

8.2 Long-term management strategies and target reference points for Bay of Biscay sole, Celtic Sea cod, Anglerfish VIIIc-IXa and Baltic cod (SGMOS 05-01)

Date: 6-10 June 2005
Venue: Lisbon
Chair: Ernesto Jardim

8.2.1 Background

1) Advice is requested concerning targets for sustainable exploitation, and harvesting rules for catch and/or fishing effort limits for Bay of Biscay Sole, Celtic Sea Cod, Anglerfish in ICES Divisions VIIIc and IXa, and Cod in the Baltic Sea.

2) Such targets and harvest rules should be commensurate with conservation status of the stocks. The rules should also be based on the precautionary principle (in that the absence of adequate scientific information should not be used as a reason for postponing or failing to take management measures to conserve the stocks concerned).

8.2.2 The detailed request

1) STECF is requested to evaluate a range of harvest rules for the stocks named in paragraph 1. with respect to medium and long term yield, stability of yield and effort and stock status with respect to safe biological limits. Evaluations shall in the first instance be made on a single species basis but the experts shall, to the extent possible, quantify mutual compatibility of the rules for the target species with the conservation needs of other species caught in the same fisheries. The types of harvest rule to be considered shall include :

    a. Target conservation reference points, and (where appropriate) limit reference points.

    b. Harvest rules where TACs and/or fishing effort are derived according to a target fishing mortality, supplemented with a rule for reducing the mortality if the spawning biomass is below a trigger level, to ensure avoiding a limit value for the spawning biomass.

    c. Harvest rules as in (a) but including an additional constraint on the year -to-year variation of the TAC including a +/- 15% limit on TAC variation.

    d. Evaluate alternative approaches to limit the year-to-year changes in TAC as considered appropriate.

e. Where available data are not adequate to estimate stock size and fishing mortality by conventional techniques, identify adaptive harvest rules (such as those directly based on survey data) that are appropriate to reaching the conservation objectives.

2) (STECF is requested to advise whether effort management is necessary to achieve the effective implementation of the harvest rule and the attainment of conservation targets.
3) The rules shall be evaluated through simulations that take into account the variabilities and uncertainties considered appropriate by the scientists following the guidance provided in the ICES SGMAS study group report. (Ref)
4) The performance of the rules shall be evaluated both with respect to the perceived state of the stock and to the state of the underlying operating model population. The performance criteria shall include :

a. Compatibility with the precautionary approach and relevant international standards and agreements.
b. Probability distributions of yield, TACs, spawning stock biomass and fishing mortality and (where relevant) fishing effort.
c. Year to to year variation in TACs, yield, spawning stock biomass and fishing mortality.
d. The risk of entering rebuilding situations in simulations without the year-to-year limitations in TAC change.

5) Evaluations shall show the robustness of the harvest rules in assuring stock recovery and maintaining stocks inside safe biological limits, considering a plausible range of scenarios.

8.3 Cod recovery plan, technical issues (SGRST 05-01)

Date: 13-17 June
Venue: Ispra, Italy
Chair: Hans-Joachim Rätz

1) STECF is requested to identify the location and season of the most important fishable concentrations of cod in the North Sea, Skagerrak, eastern Channel, Kattegat, Baltic Sea, west of Scotland, Celtic Sea and the Irish Sea, and if possible to quantify the proportion of cod caught in these areas and/or seasons. The analysis should present data on (a) a recent short period, reflecting present conditions; (b) a sample of years when cod was within safe biological limits to indicate its distribution at that time.
2) STECF is requested to review the current system for the management of fishing effort in the context of the cod recovery plan (Annex IVa of Regulation 27/2005) and to :

a. review the definition of the area defined in Point (2), the gear categories defined in Point 4, and the associated days at sea defined in Point 6 and associated conditions;
b. recommend ways to improve the conservation of cod, consistent with the Cod Recovery Plan (Regulation 423/2004) and to improve the access of fishing vessels to other, underexploited resources.

3) STECF/ICES is requested to evaluate systems feasible for management of fishing effort in the context a multi-annual management plan for the cod stocks in the Baltic Sea. The evaluation should include but not necessary be limited to:

a. systems similar to the days at sea system adopted in the TAC and quota regulation (Annex IVa of Regulation 27/2005);
b. systems based on closed seasons and/or areas.

In the foregoing evaluations, STECF is requested to take account of fish catches that are discarded as well as those that are landed.

8.4 Mixed fisheries (SGRST 05-02)

Date: 17-21 October, 2005
Venue: Brussels

Chair: Hans-Joachim Rätz

1) Obtain and compile all available recent data concerning mixed-species demersal fisheries in Community waters and adjacent areas. The data of specific interest are landings and discards by species and by fleet, where possible disaggregated by age and by number of fish.
2) Review the data compiled in (1) and identify those stocks, areas and fleets where significant technical interactions exist and for which adequate data exist to permit those interactions to be evaluated.
3) For each of the area-fleet-stock groupings identified in (2), calculate catch forecasts for 2006 for the stocks concerned, based on:

    a. the most recent ICES assessments
    b. ACFM advised catches for 2006
    c. an appropriate range of assumptions for the factors describing the relative policy weights to be attached to each fish stock, including any particular values that may be requested by the Commission services on receipt of the ICES advice.

4) In support of the above tasks, continue methodological and software development as initiated by this Ad Hoc Working Group since 2002.

8.5 Ad hoc WG on the by-catch of sea turtles in the EU long line fisheries. Long line fisheries and their turtle by-catches: biological and ecological issues, overview of the problems and mitigation approaches (SGRST/SGFEN 05-01).

Date: 4-8 July 2005
Venue: Brussels
Chair: Antonio di Natale

8.5.1 Background:

The increasing longline fisheries in EU waters have resulted in increasing by-catches of sea turtles as well. At the STECF Plenary in November 2004 a paper on mitigation methods for by-catches of sea turtles in pelagic long line fisheries for tuna and swordfish in the NW Atlantic was evaluated.

STECF report, Nov. 2004: Evaluation of the effect of circle hooks. (Ref. US. '*Experiments in the western Atlantic northeast distant waters to evaluate sea turtle mitigation measures in the pelagic longline fishery')*

As first step, STECF recommended that a working group be convened with the objective of compiling a comprehensive overview of the marine turtle by-catch problem related to longline fisheries, in particular in the various areas covered by Community fisheries. This group should compile all published data from various oceans and fisheries with the purpose of identifying 'hot-spots' where this problem is or may be significant. The main purpose of such WG is to compile the available quantitative data necessary on which to base future mitigation measures.

In addition STECF also recommended in the 2004 report (SEC 2005/369):

1) that additional experiments be conducted to obtain the necessary information on the most important surface longline fisheries in various areas (South-East Pacific, Indian Ocean, North and South Atlantic, Mediterranean) where Community fleets operate, with a particular attention to the pelagic longline fisheries requiring smaller hook size. The information collected during these experiments should include comprehensive details of all catches including, target species, turtles, sharks and other by-catch components.
2) STECF recommends that detailed catch information, including, target species, turtles, sharks and other by-catch components, should be collected by observers placed on Community vessels operating in pelagic longline fisheries.
3) STECF recommends that additional efforts be devoted to identify areas and seasons where important migrations or concentrations of marine turtles occur. This should include necessary information on yearly variation etc, with a view to introducing real-time management of these fisheries.)

8.5.2 Purpose of the WG :

1) To identify EU pelagic long line fisheries with by-catches of sea turtles;
2) To compile information on the most recent development in mitigation methods on how to reduce these by-catches of sea turtles.

8.5.3 Terms of reference

1) Review/identification of EU long line fleets where by-catches of sea turtles have been observed.
   a. Atlantic fisheries: Pelagic long lines for tuna and tuna like species (including specific CPUE data for target species and marine turtles).
   b. Mediterranean fisheries: All LL pelagic fisheries (including specific CPUE data for target species and marine turtles).
   c. EU long line fisheries in other distant waters (including specific CPUE data for target species and marine turtles).
2) Overview of the available (quantitative) data on by-catch of turtles in EU waters or in other areas where EU pelagic LL fleets are active by fishery, area and season.
3) Overview of the percentage of hooked marine turtles over the total recovered in national turtle rescue centres (if available).
4) 4) Overview of mitigation method/approaches with special reference to recent EU projects and US papers. The expert members of the WG are expected to prepare draft input to the WG report prior of the actual WG meeting. During the meeting the text input and tables (data) is discussed compiled and edited by the participants.

8.6 Sensitive fish and marine habitats. Importance for biodiversity conservation and production etc. in the Mediterranean. (SGFEN 05-01)

Date: To be decided
Venue: Brussels
Chair: To be decided

8.6.1 Background.

The need for identification and mapping of marine habitats crucial for conservation of commercial fish and shellfish resources. Therefore in selecting such areas focus should be put on the protection of the most important commercial species in the Mediterranean (ref. GFCM). 3 major species groups are considered:

1) Small pelagics
2) Large pelagics
3) Demersal species incl. shrimps

Terms of reference

1) Based on the list of Mediterranean species adopted by GFCM as priority species, select the main species whose critical life history stages are well known (hatching, larval stage, spawning) as well as the areas connected to these life stages, including spawning grounds, nursery areas and other life-cycle sensitive areas.
2) Identify and review the main candidates for protected habitats fundamental for the above selected species. Concentrating on those, which are already well documented.
3) Present possible regulation measures to protect such sensitive habitats in space and time (For example: closed areas, closed seasons, gear regulations) and comment the potential impact on:
   a. the stocks
   b. the commercial fisheries
4) Propose methodology to allow evaluation of the future impact of the proposed regulations, and identify the data required by each proposed method. If appropriate provide information on the data requirements for inclusion in the Data Regulation.

8.7 Fast Track Advice for in year HCR North Sea Sandeel (ADHOC 05-02).

Date: 4-7 May 2005
Venue: By correspondence
Chair: Peter Wright

The terms of reference are:

1) gathering data and using the agreed model on a weekly basis starting the week beginning 4 April 2005 (action DIFRES).
2) ensuring quality assurance of the data and model output by exchange between WG members (DIFRES, CEFAS and FRS) on a weekly basis starting from the end of week beginning 4 April.
3) reviewing the model weekly and certify the final run (action CEFAS)
4) ensuring good communications by sending a copy of model output to the European Commission and the chair of STECF weekly (starting from the end of week beginning 4 April).
5) following agreement between the working group participants send a one page summary and figure giving the final model output and draft advice on the harvest control rule to the Chairman of STECF (John Casey CEFAS) and John Simmonds at FRS Aberdeen by 9 May 2004.

8.8 *Ad Hoc* WG on North Sea Sandeel (ADHOC 05-03)

Date: To be decided
Venue: To be decided
Chair: To be decided

8.8.1 Background

STECF considers that there is an urgent need to improve the basis for North Sea sandeel management. Such a change may result in a proposal for a new HCR that will probably require agreement at the December Council. It is therefore suggested that an additional meeting of the Ad Hoc WG on sandeels meet prior to STECF plenary in November to propose one or more suitable HCRs.

8.8.2 Terms of Reference

1) To assemble information on the eco-system requirements for minimum abundance levels for sandeel in the North Sea to better inform a suitable B_{lim} for sandeel management under the eco-system approach and if appropriate advise on a change in B_{lim}.
2) To establish through stochastic simulation a HCR or range of HCRs. Selecting suitable long term F and trigger biomasses to replace the values in the current HCR. The simulation should include the following:-
3)
    a. the accuracy of the estimate of 1 group year-class by week 17 in the fishery;
    b. the implementation error between catch and TAC in the fishery, including delays in implementation of management.
    c. inclusion of total mortality at age 2+ group between 1 January and spawning time for the target year +1.
    d. the mortality implied by the fishery to week 17.
    e. the precautionary approach which unless otherwise advised for the purposes of the simulation may be based on a probability of SSB being below B_{lim} less than 5% of the time in any year of a 10 year period;
    f. B_{lim} should be taken to be 430,000 t unless a higher level is deemed more appropriate under eco-system approach for the North Sea (see TOR 1) or due to a stock recruit relationship.
    g. stochastic recruitment conforming to the variability observed, including stock recruit relationship and any autocorrelation in annual variability.

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