

# ICES AMAWGC REPORT 2006

ICES Advisory Committee on Fishery Management

ACFM:17

## REPORT OF THE ASSESSMENT WG CHAIRS (AMAWGC)

30 JANUARY – 3 FEBRUARY 2006

ICES HEADQUARTERS



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## Executive Summary

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The ICES advice on fisheries is expected to emphasise longer term management issues. It will address the practical situation of fisheries management better by being both stock and fisheries-oriented and it will increasingly include ecosystem considerations. These changes are introduced as a response to changes in the policy and management environment including both recent international agreements and resolutions such as the WSSD 2002 declaration and requirements from clients as expressed in the MOU between ICES and the European Commission.

In order to introduce these changes there is a requirement to develop the necessary approaches and methodologies to be implemented by the working groups. These changes will allow ACFM to have the relevant input required to address new aspects of the advice. Inputs of additional information on ecosystem related issues and management strategy evaluations are produced by the SGMAS and WGRED. The AMAWGC group serves as the interface between this work and the assessment working groups. The chairs of the SGMAS and other relevant experts introduce these approaches to the chairs of assessment working groups. AMAWGC is a forum to discuss and decide on the implementation of these matters within the course of WG meetings in 2006.

AMAWGC 2006 has focussed on four areas of work:

- Evaluation of management strategies
- Incorporation of ecosystem aspects in fisheries advice (both environmental drivers and fisheries effects on the ecosystem)
- The incorporations of mixed fisheries issues into the advice
- Improving stock assessment practices and processes

### Conclusions

- There are a number of management plans that have been implemented by fisheries managers but that have not been evaluated by ICES (See: Annex 4: ). The relevant WGs will take up these evaluations with priority so that evaluations are available in ACFM in 2006. The evaluation of existing management that have not been evaluated by ICES will be taken up in 2006. This implies specific actions from WGNSSK, WGNSSD, WGHMM, WGNPBW and AFWG (through WKHAD).
- It would be useful to take the SGMAS report to a RAC environment or an environment where managers jointly develop management plans, to assess how ICES can contribute to such a development process.
- In the process of reviewing the WG reports, there should be explicit recognition of the evaluations of harvest control rules. These evaluations should also be explicitly reviewed.
- The ACFM report should be more explicit when management plans have been evaluated. It should be stated what kind of risks are associated with the plan and how it has been evaluated.
- All working groups will work on developing displays of mixed fisheries data
- WGHMM and WGNSSK will test the Fcube approach this year
- WGEF, WGDEEP and WGNEW will liaise with the area based working groups and supply those with relevant information on mixed fisheries and ecosystem aspects.
- FLR is useful approach in WG context. It has the potential to standardize many of the standard analysis and remove the burdensome copying and pasting that is an important feature of WG practice. Standardization of FLR is needed. This implies a strict version control system whereby the replication of assessments can be warranted.

- FLEDA is a first step of an application that could be directly used in working groups (e.g. WGHMSA). Bootstrapping techniques developed in FLR should be checked and optimized for WG use.
- Applications of FLR will be presented to WGNSSD and WGNSSK using additional expertise to be present at the WG. Development of FLR should not be at the expense of WG time; preparations should be carried out before the meeting.
- A standard assessment-directed course will be made available on Wiki-system (<http://flr-project.org>). This will be the basis to run FLR courses in different institutes.
- With regards to InterCatch, the following steps need to be taken in 2006:
  - Testing the method on historical data. Importing historical data from some stocks that are currently raised with Salloc and compare results with Intercatch (as this basically uses the same methodology). The secretariat should provide assistance in doing the historical comparisons.
  - Training the users (data submitters and stock coordinators). The preferred method is training just before it is needed, but it should not be immediately prior to the WG, as the aim is to move the data compilation further in advance of the meeting.
  - Testing the useability of the software in working groups. It was agreed that an incremental implementation will be carried out in all relevant working groups. They will try the software on a few test stocks. The process should not take time during the working group
- Comparing current assessment and forecast with previous years is an explicit WG task. ACFM is responsible for comparing the advice. Showing historical assessment performance is a important indicator of assessment quality. Needs to be shown to clients and stakeholders. It shows the combination of data uncertainty and model uncertainty.
- Maintenance of the historical quality database could be a task for the ICES secretariat. There is R-code is available for graphic displays of historical assessment data (spaghetti plots)
- Bias and variance metrics need to be further developed; e.g. WGMG 2006.

### Recommendations

- **AMAWGC recommends:** there is a need for a group within ICES to follow the developments with regards to the evaluation of harvest control rules and the development of management strategies. This group should pay special attention to mixed fisheries and ecosystem aspects (robustness to environmental regimes). [See Annex 1: ]
- The collation of mixed fisheries data should be the same as the collation of single species data that is used as input to the stock assessments. At present these two data streams are often treated different in the working groups. The InterCatch database (see section 5.4) would be the ideal forum to carry this information. **AMAWGC recommends:** that the mixed fisheries functionality of InterCatch be developed in the short term, preferably in 2006 (see Annex 2: ). This can be achieved by allowing direct (read-) access to the InterCatch database on which working groups can develop scripts to extract and compile the mixed fisheries data. These scripts could then eventually be build into the InterCatch database system.
- **AMAWGC recommends:** that the WKMIXMAN group should meet next year and have as specific terms of reference to: (1) further develop the displays of mixed fisheries data, (2) to invite appropriate experts (economists, gear technologists) and evaluate the F3 approach using hindcasting and simulated data methods, (3) to evaluate the results of the exploratory applications in WGHMM and WGNSSK (See Annex 3: )
- **AMAWGC and WGRES recommend:** that the SGMSNS group investigates the weight at age in the predator species in relation to the abundance of prey species.

- There is a need for better integration of the ecosystem and fisheries based advice in the advisory report. **AMAWGC and WGRED recommend** to facilitate this process by drafting a "what would ICES advice look like if we include the ecosystem aspect into the fisheries advice". This could then be discussed at a joint ACE/ACFM meeting.
- To improve the interaction between survey and assessment groups, **AMAWGC recommends:** to organize a joint session at ASC 2006 with AMAWGC, LRC and RMC on survey-assessment interaction
- **AMAWGC recommends:** that an ICES course on evaluation of management plans is organized in 2007. The chair of ACFM will take this up with the chair of RMC.
- **AMAWGC recommends** that the terminology around management plans be further explored. One possible approach that could be taken is that we document the outcomes of the evaluation (e.g. this management plan has a 10% probability that the stock will be below Blim within 10 years from now) and also how the evaluation has been carried out (reference to the original work in a working group report).
- **AMAGWC recommends:** that probabilistic assessments and forecasts be developed for a limited number of test-cases and that they are taken through the phase of how to formulate advice based on such a probabilistic basis.
- The deterministic forecast table is suggesting much more precision that can be warranted from the data and the analysis (see section 5.1). **AMAWGC recommends** that alternative displays be developed for the short term implications. These displays should be based on risk statements rather than deterministic forecasts.
- **AMAWGC recommends** that ACFM needs to provide clear guidelines to review groups on how they should deal with different types of assessments: benchmark, update, exploratory, observation list.
- **AMAWGC recommends** that the section on "Information of the fishing industry" should focus on the process of how information from the industry is obtained and what is done with that information.
- **AMAWGC recommends:** when discussing the contents of the advisory report with the clients during the MICC meeting in April 2006, ICES should propose to change the display of short term implications of advice, to minimize the format for stocks on which we do not have information (e.g. Clyde herring).

# 1 Introduction

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## 1.1 General

The ICES advice on fisheries will in the future emphasise longer term management issues. It will address the practical situation of fisheries management better by being both stock and fisheries-oriented and it will increasingly include ecosystem considerations. These changes are introduced as a response to changes in the policy and management environment including both recent international agreements and resolutions such as the WSSD 2002 declaration and requirements from clients as expressed in the MOU between ICES and the European Commission.

In order to introduce these changes there is a requirement to develop the necessary approaches and methodologies to be implemented by the working groups. These changes will allow ACFM to have the relevant input required to address new aspects of the advice. Inputs of additional information on ecosystem related issues and management strategy evaluations are produced by the SGMAS and WGRED. The AMAWGC group will serve as the interface between this work and the working groups. This will be done through the chairs of the SGMAS and other relevant experts introducing these approaches to the chairs of assessment working groups. AMAWGC will then act as a forum to discuss and decide on the implementation of these matters within the course of WG meetings in 2006.

The Annual Meeting of Assessment Working Groups Chairs [AMAWGC] (Chair: Martin Pastoors, The Netherlands) will meet back-to-back with WGRED at ICES Headquarters from 30 January 14:00 to 3 February 13:00 2006 and in the margin of the ASC 2006 to:

- review the Table of Contents for the ICES Advisory Report for 2006 and for each Chapter identify what the Groups that shall contribute;
- review and plan further implementation of long-term management simulations and evaluations of recovery plans and harvest control rules as presented by e.g. the Study Group on Management strategies (SGMAS);
- further inclusion of the work of the Working Group on Regional Ecosystem Description (WGRED) in the ICES advisory process regarding fisheries
- plan further implementation of fisheries-based advice by the Assessment Working Groups and integration of fisheries technology expertise, using the results of WKMIXMAN;
- review developments in stock assessment methodology in relation to the implementation in the Assessment Working Groups;
- Make a road map of where the individual WGs should be moving in the medium and long term. This should include issues like assessment methods, surveys, basic scientific work, data collection, proactive development of management strategy options, mixed fisheries issues, ecosystem impacts and impacts on ecosystem analysis.

AMAWGC will report by 3 March 2006 for the attention of ACFM.

Invited chairs:

- Under ACFM: WGMHSA, HAWG, NWWG, WGBFAS, AFWG, WGNPBW, WGNSSDS, WGSSDS, WGNSSK, WGNAS, WGDEEP, WGHMM, WGEF, SGMAS, WKMIXMAN;
- under ACE: WGEKO, WGRED;
- under FTC: WGFTB



- under LRC: survey WG and PG chairs;
- chair ACE, chair ACME.

Invitations to WG chairs were issued very close to the meeting resulting in a number of WG chairs not being able to attend. Furthermore, the issue of which chairs of WGs were invited created some confusion about the objectives of the meeting and what the different chairs would contribute.

## 1.2 Participants

<i>Name</i>	<i>Chair of</i>
Manuela Azevedo	WGHMM
Maurice Clarke	WGEF
Wim Demaré	WGSSDS
Mark Dickey-Collas	HAWG
Norman Graham	FTFB
Tomas Gröhsler	WGBAST
Asta Gudmundsdóttir	WGNPBW
Einar Hjorleifsson	NWWG
Simon Jennings	ACE
Ciaran Kelly	WGHMSA
Yuri Kovalev	AFWG
Phil Large (replacing Paul Marchal)	WGDEEP
Coby Needle	WGNSSK
Martin Pastoors (Chair)	ACFM
Dave Reid (part-time)	LRC
Jake Rice (part-time)	WGRED
Stuart Reeves (part-time)	WKMIXMAN
Heye Rumohr (part-time)	BEWG
Robert Scott	WGNSDS
Dankert Skagen (part-time)	SGMAS
Doug Wilson (observer)	WGFS

## 1.3 Working procedures

The Terms of Reference were addressed by having different focussed sessions during the meeting:

Day	Issue
Monday	<ul style="list-style-type: none"> <li>• Advice and WG issues in 2006</li> <li>• Joint session with WGRED: Integration of ecosystem and fisheries</li> </ul>
Tuesday	<ul style="list-style-type: none"> <li>• Management strategy evaluations (SGMAS)</li> <li>• Survey – assessment interaction (4a)</li> </ul>
Wednesday	<ul style="list-style-type: none"> <li>• Joint session with WGRED: Ecosystem effects in stock assessment</li> <li>• How to document assessment quality ?</li> <li>• Workshop on FLR in stock assessment WGs</li> </ul>
Thursday	<ul style="list-style-type: none"> <li>• Mixed fisheries (WKMIXMAN)</li> <li>• Stock assessment data handling: InterCatch and Sharepoint</li> <li>• Roadmaps for WGs: priorities and phasing</li> </ul>
Friday	<ul style="list-style-type: none"> <li>• Joint session with WGRED on environmental events 2005 and linkage between ecosystem and fisheries advice</li> <li>• Review of achievements; evaluation of the process</li> </ul>

The ToRs of the meeting are directly reflected in the sections of the report.

## 2 Evaluation of recovery plans and harvest control rules

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Dankert Skagen presented the draft report of the Study Group on Management Strategies (SGMAS, doc 11). The Study Group on Management Strategies (SGMAS) was established with the specific task to “*define a framework based on long-term considerations for management strategy evaluations in a Precautionary Approach context*” and to “*describe the framework in a separate document (eventually to become an element in the quality handbook) providing a description of the approach and operational guidelines for implementation of management strategy evaluations by ICES*”. The draft report is the combined work of two meetings in Copenhagen from 31 January-4 February 2005 and 23-27 January 2006 at ICES Headquarters under the co-chairmanship of Dankert Skagen (Norway) and John Simmonds (UK).

The guidelines for evaluation of management strategies are considered finalized by SGMAS. Nevertheless, the input from WGRED and WGEKO on the ecosystem aspects in these evaluations could be strengthened (both in terms of environmental drivers and ecosystem effects).

A list was presented with all the agreed management plans that have not yet been evaluated by ICES (see Annex 4: ). It was agreed that evaluation of the remaining unevaluated management plans should be an important aim for 2006. The terminology in the ACFM report that “ICES has reviewed the management plan and found it to be/not to be in accordance with the precautionary approach” could be made more informative when it includes the results of the analysis and how they have been obtained. This means that ICES would report on the risks associated with the management plan and base a conclusion on whether the plans were precautionary on the findings of the evaluation.

### *Conclusions*

- **AMAWGC recommends:** there is a need for a group within ICES to follow the developments with regards to the evaluation of harvest control rules and the development of management strategies. This group should pay special attention to mixed fisheries and ecosystem aspects (robustness to environmental regimes). (See Annex 1: )
- There are a number of management plans that have been implemented by fisheries managers but that have not been evaluated by ICES (see Annex 4: ). The relevant WGs will take up these evaluations with priority so that evaluations are available in ACFM in 2006.
- It would be useful to take the SGMAS report to a RAC environment or an environment where managers jointly develop management plans, to assess how ICES can contribute to such a development process.
- In the process of reviewing the WG reports, there should be explicit recognition of the evaluations of harvest control rules. These evaluations should also be explicitly reviewed.
- The ACFM report should be more explicit when management plans have been evaluated. It should be stated what kind of risks are associated with the plan and how it has been evaluated.

### *Implications for working groups*

- The evaluation of existing management plans that have not been evaluated by ICES (Annex 4: ) will be taken up in 2006. This implies specific actions from WGNSSK, WGNSSD, WGHMM, WGNPBW and AFWG (through WKHAD).

### 3 Mixed fisheries and technical interactions

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Stuart Reeves, one of the co-chairs of the Workshop on Simple Mixed Fisheries Management Models [WKMIXMAN] that met 9-13 January 2006 at ICES HQ, Copenhagen gave a presentation on the main findings of the workshop. The workshop was tasked to:

- a) define a framework for simple models of mixed fisheries which can be used to obtain consistency between management (TAC and/or effort) advice for species caught together, given the current availability and accessibility of data;
- b) provide operational guidelines for the use of such models;

The workshop distinguished between providing data and analysis of mixed fisheries and forecasting mixed fisheries into the future. With regards to data and analysis of mixed fisheries information, the workshop considered that easily interpretable displays of the often highly dimensional data can provide useful information to managers and stakeholders on the historical linkages between species, gears, mesh sizes etc. Examples of such displays are presented in the workshop report (doc 12).

There was a discussion on the terminology used by WKMIXMAN with regards to fleets, fisheries and métiers. The STECF subgroup SGRN (Study Group on Research Needs) has also dealt with the issue of fleet definitions and they have generated a different terminology for the same processes. It is unclear how these two approaches can be harmonized.

The workshop evaluated a number of possible mixed-fishery approaches against a set of criteria based on the problems with the MTAC approach which has previously been used in assessing mixed fisheries forecasts.

Clara Ulrich (DIFRES) gave an invited presentation on the model that was selected by the workshop as a potential candidate for further development in the direction of mixed fisheries forecasts. This "Fleet and Fisheries Forecast" ( $F^3$  or Fcubed) which has been developed at DIFRES as part of the Danish TEMAS project and the EU TECTAC project. The cornerstone of  $F^3$  is to consider the vessel as the basis of manageable unit, and to account for all its trips within each year. Trips are aggregated into métiers, and vessels are aggregated into homogeneous fleets, and their average activity patterns are described in terms of percentage of effort spent in the various métiers. The métiers are then linked to the stocks (target species and bycatch) through catchability matrices.

#### *Main issues in the discussion*

The need for displays of mixed fisheries data was acknowledged. Working Groups are invited to come up with displays of mixed fisheries data that can be used to communicate the linkages to the clients and stakeholders.

The collation of mixed fisheries data should be the same as the collation of single species data that is used as input to the stock assessments. At present these two data streams are often treated different in the working groups. The InterCatch database (see section 5.4) would be the ideal forum to carry this information. There is an urgent need to expand the InterCatch database so that it can be used to generate fleet and fisheries based data that can be used to develop displays. This can be achieved by allowing direct (read-) access to the InterCatch database on which working groups can develop scripts to extract and compile the mixed fisheries data. These scripts could then eventually be build into the InterCatch database system. **AMAWGC recommends: that the mixed fisheries functionality of InterCatch be developed in the short term, preferably in 2006** (see Annex 2: )

The elasmobranch and deepsea WGs operate on mixed fisheries that often have interactions with other demersal fisheries. The data basis for these interactions are often weak because the landings are not recorded at the species level. There is a need for a closer linkage between

WGEF, WGDEEP and WGNEW with the regional assessment working groups WGNSSK, WGNSSD, WGSSDS, WGHMM. WGEF and WGDEEP will provide input to the area based working groups on the mixed fisheries interactions (qualitative or quantitative) which can be used in the ecosystem considerations for the areas. In that way the advice on the areas will be better integrated between fisheries and ecosystem aspects.

The F3 approach could be a useful tool to work towards mixed fisheries forecasts. However, there is a need to develop the science behind mixed fisheries forecasts. When ICES provides mixed fisheries forecasts, there will be an understanding among clients and stakeholders that we are actively modelling the behaviour of fishing fleets. We have to make sure that we have the knowledge to back up that modelling. This requires input from economists and gear technologists on the fleet dynamics involved. To test the approach, we need to do hindcasting exercises and analysis based on simulated data. In addition we will carry out some trial applications in WGHMM and WGNSSK with the now available method. Clara Ulrich will draft a specification of requirements to these WGs. **AMAWGC recommends:** that the WKMIXMAN group should meet next year and have as specific terms of reference to: (1) further develop the displays of mixed fisheries data, (2) to invite appropriate experts (economists, gear technologists) and evaluate the F3 approach using hindcasting and simulated data methods, (3) to evaluate the results of the exploratory applications in WGHMM and WGNSSK (See Annex 3: ).

Short term forecasts that are used are point estimates. We are moving towards a framework where probabilistic forecasts should become the norm. It is likely that the F3-approach could incorporate probabilistic forecasts but this should be considered as a second stage in the development.

The issue of input from managers was discussed. In the F3 method this takes the form of different management rules on how effort gets reallocated. It is unlikely that any mixed fisheries model will get around the problem of requiring specific inputs from managers or stakeholders on the relative importance of different species.

#### *Implications for working groups*

- All working groups will work on developing displays of mixed fisheries data
- WGHMM and WGNSSK will test the F3 approach this year
- WGEF, WGDEEP and WGNEW will liaise with the area based working groups and supply those with relevant information on mixed fisheries and ecosystem aspects.

## 4 Environment – fisheries interactions (WGRED)

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WGRED presented three main recommendations for the advisory process in 2006 and beyond:

- 1) Recommendations directed at working groups:

*Capelin and cod in Iceland:* pessimistic assumptions about weight at age in cod; less spatial overlap between cod and capelin than ever before.

*Prey in the North Sea:* pessimistic assumptions about weight at age and maturity for MSVPA predators. Need for analysis of recent MSVPA for new M2 values.

Discussion: is there a direct correlation between e.g. sandeel availability and weight at age of cod? And if so: how much lower. A recent paper suggested that food availability not the major issue but that the overlap between species is very important (Heath 2005).

**Recommendation:** that the SGMSNS group investigates the weight at age in the predator species in relation to the abundance of prey species.

## 2) Advisory committee

There are suggestions of changes in productivity of southern hake and southern horse mackerel. However, there are no indications on regime shifts in upwelling areas around Iberian peninsula. Recommendation: if there is no regime shift apparent, don't act as if one has occurred. Do not fish an incoming recruitment as if it is the sign of a regime shift.

## 3) Long term issues

Giving advice on the role of warming of the North Sea and NE Atlantic has been problematic. Nevertheless, clients and stakeholders expect ICES to acknowledge the ongoing developments and to discuss the potential consequences. The issue is how to address regime shifts in the advisory process: when is there a regime shift and in what way is it expected to affect the fish stocks and the fisheries. ICES acknowledges that there are large changes in plankton and that species diversity is increasing in the southern and northern north sea, but it is not connected to the advice.

At present there is no synthesis for application of environmental drivers in fisheries management advice.

### *Recommendation*

- Draft a "what would ICES advice look like if we include the ecosystem aspect into the fisheries advice".
- Set aside one day in ACE/ACFM to formulate a draft advice of the future.

## 5 Developments in stock assessment methodology

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### 5.1 Probabilistic assessments and forecasts

Many deterministic assessments are extremely sensitive to small changes in input data or model settings, making it very difficult to decide on final configurations. There are no hard and easy criteria to decide between the fits of different model configurations. At present there is very little explicit recognition of the uncertainties in the assessment process in the ACFM report. The single stock summaries are mostly based on deterministic assessments and forecasts.

One way to show the uncertainties in the assessments, is to display the sequence of historical assessments of a stock (see section 5.5). However, it is not immediately obvious how this would affect the forecasts at any individual year.

Another way would be to develop *probabilistic assessments and forecasts* that incorporate the uncertainty in model structure and data. The techniques for probabilistic assessments have been around for many years already. In several parts of the world there is increasing experience with using a probabilistic approach in fisheries management advice. This could lead to a situation in which there is no "assessment decision" to make. The outcome of the assessment would be a distribution of abundance, mortality, etc.

**AMAGWC recommends:** that probabilistic assessments and forecasts be developed for a limited number of test-cases and that they are taken through the phase of how to formulate advice based on such a probabilistic basis.

### 5.2 Linkages between survey groups and assessment groups

The linkages between some of the survey groups and some of the assessment working groups are very weak. This is despite the fact that surveys form an important component of the stock

assessment process. There was a general agreement that processes should be identified to increase the interaction between survey and assessment groups.

Suggestions for improving the interactions:

- survey groups to write user friendly reports
- assessment groups to provide relevant feedback to survey groups; what information would they require.
- Survey WG chair should attend assessment WG

Given that there are many problems with the landings data, the integration with the planning group on commercial catches (PGCCDBS) should also be increased.

The type of information that working groups need from survey groups:

- i ) The characteristics of the survey (distribution, etc.)
- ii ) The likely performance of the survey as abundance index.
- iii ) Internal consistency, precision and accuracy of the surveys.
- iv ) Long term changes in distribution by year class.
- v ) Survey catchability.

In addition, the survey WGs are asked to provide guidance on the calculation of and how to cope with abundance indices from surveys with recent low catches of certain species, because of the decreasing abundance of these species. This is particularly important for stocks at risk such as North Sea cod.

*Recommendation*

- Organize a joint session at ASC 2006 with AMAWGC, LRC and RMC on survey-assessment interaction

### 5.3 FLR: a fisheries library in R

A small workshop was organized which introduced the use of the Fisheries Library in R (FLR) for assessment working group purposes to the members of the group. FLR is being developed with the overall aim of providing a toolbox for harvest control rule evaluations. As a byproduct, we can use the toolbox to facilitate the annual assessment process within ICES. After the workshop there were presentations on two applications of FLR: one on exploratory data analysis and one on a script for a full assessment including uncertainty estimation due to data and due to model assumptions.

Conclusions:

- FLR is useful approach in WG context. It has the potential to standardize many of the standard analysis and remove the burdensome copying and pasting that is an important feature of WG practice.
- FLEDA is a first step of an application that could be directly used in working groups (e.g. WGHMSA)
- Applications of FLR will be presented to WGNSSD and WGNSSK using additional expertise to be present at the WG.
- Development of FLR should not be at the expense of WG time; preparations should be carried out before the meeting.

- Bootstrapping techniques developed in FLR should be checked and optimized for WG use.
- Standardization of FLR is needed. This implies a strict version control system whereby the replication of assessments can be warranted.
- The chair of ACFM will write an email to FLR development group on need for a clear release policy and the concept of stable versions.
- A standard assessment-directed course will be made available on Wiki-system (<http://flr-project.org>). This will be the basis to run FLR courses in different institutes.
- An ICES course on evaluation of management plans is needed for next year. The chair of ACFM will take this up with the chair of RMC.

#### 5.4 Intercatch

Henrik Kjems Nielsen gave a presentation on the current state of InterCatch, the new standard application for holding and aggregating basic catch and effort data at ICES. The developers were complimented with achieving what is considered a long-standing request from working groups to assist in the process of compiling data.

So far, no applications on full datasets have been carried out.

Essential steps to be followed in 2006:

- Testing the method on historical data. Importing historical data from some stocks that are currently raised with Salloc and compare results with Intercatch (as this basically uses the same methodology). The secretariat should provide assistance in doing the historical comparisons.
- Training the users (data submitters and stock coordinators). The preferred method is training just before it is needed, but it should not be immediately prior to the WG, as the aim is to move the data compilation further in advance of the meeting.
- Testing the useability of the software in working groups.

Additional requirements:

- Export the allocation scheme of how unsampled strata have been raised
- It would be useful to know what the reviewers have said so far
- AMAWGC recommends that the database should also be used for generating mixed fisheries data (See Annex 2: )

*Implications for working groups*

- It was agreed that an incremental implementation will be carried out in all relevant working groups. They will try the software on a few test stocks. The process should not take time during the working group.

#### 5.5 Quality of assessment and advice

Mette Bertelsen gave a presentation on the absence documentation of large changes in perceptions in some stocks (e.g. blue whiting, herring in 30, Anchovy in Bay in Biscay, Sole in Bay of Biscay). It is very important that these changes be explained in the advisory report beyond the stage that we note that there is a difference in perception.

There can be three reasons for changes:

- same data but very different advice
- new series of data
- error made in previous years.

WGs should give these explanations as ACFM does often not have the detailed knowledge to find those. There should be a dedicated section in the WG report to do this.

Martin Pastoors gave a presentation on the treatment of quality control data. A private database has been initiated around 5 years ago in which the individual stock assessments are stored with as an extra attribute the year of assessment. This allows a direct and fast comparison between assessments in different years. This is believed to be an expression of the uncertainty in the assessments as it included the uncertainty in the data, the uncertainty in the model and the uncertainty in the assessment process. There has been some development in the definition of metrics for bias and variance in historical assessment data (Jonsson and Hjorleifsson 2000, Pastoors 2005). Before these metrics could be applied in an assessment WG context, there is a need for a critical evaluation by WGMG. Several WGs have already developed displays of historical uncertainty. They are invited to present those to WGMG.

#### *Conclusions*

- Comparing current assessment and forecast with previous years is an explicit WG task. ACFM is responsible for comparing the advice.
- Showing historical assessment performance is a important indicator of assessment quality. Needs to be shown to clients and stakeholders. It shows the combination of data uncertainty and model uncertainty.
- Maintenance of the historical quality database could be a task for the ICES secretariat.
- There is now R-code is available for graphic displays of historical assessment data (spaghetti plots)
- Bias and variance metrics need to be further developed; e.g. WGMG 2006.

## 6 Table of contents of advisory report 2006

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This section presents an evaluation of the advisory report of 2005 and the implications that could have for the report in 2006.

In general, several members of AMAWGC reported that clients and stakeholders had complained that they had difficulties in finding the information they were looking for. To a certain extend, this is a deliberate strategy, to move away from the short term, TAC based advice, towards an advice that had a long term view and is ecosystem based.

### 6.1 Ecosystem overview sections

There were no specific comments on the ecosystem overview sections. There have been suggestions to change the EcoRegions to fit more closely with the RACs (regional Advisory council) division, but WGRED considered that this was not a strong enough reason to change them in the advisory report.

Several participants noted that there were inconsistencies between the fisheries advice and the ecosystem advice. Furthermore, there was an absence of linkage between these section.



## 6.2 Mixed fisheries sections

Bycatches of elasmobranchs should be included in the mixed fisheries overview of the different regions. The ecosystem implications of these bycatches need to be linked to the ecosystem overviews.

The table of interactions between species and fisheries has some general merit. However, as discussed in the section on mixed fisheries (section 3), the display of mixed fisheries data would be a better way to document the linkages.

WG chairs indicated a need for more guidance on how to prepare the mixed fishery summary sheets. The chair of ACFM will send around an updated template for mixed fisheries sections with what is expected in the different sections.

## 6.3 Single stock summaries

In general, the single stock summaries often do not convey a clear message but rather a collection of issues, findings and considerations. WG chairs indicated a need for more guidance on how to prepare the summary sheets. The chair of ACFM will send around an updated template for single stock summaries to WGs with what is expected in the different sections. The focus will be on the overall "story" and how the different sections fit in.

The evaluation of current management plans is often phrased as whether or not the plan is consistent with the precautionary approach. AMAWGC discussed the information content of that statement and how transparent it is (can clients deduce how this has been evaluated?). There are no fixed criteria for judging whether or not a management plan is consistent with the precautionary approach. That depends among other things on the risk level and the time frame that are used. **AMAWGC recommends** that the terminology around management plans be further explored. One possible approach that could be taken is that we document the outcomes of the evaluation (e.g. this management plan has a 10% probability that the stock will be below Blim within 10 years from now) and also how the evaluation has been carried out (reference to the original work in a working group report).

The deterministic forecast table is suggesting much more precision than can be warranted from the data and the analysis (see section 5.1). **AMAWGC recommends** that alternative displays be developed for the short term implications. These displays should be based on risk statements rather than deterministic forecasts.

The section on "Information of the fishing industry" should focus on the process of how information from the industry is obtained and what is done with that information.

There is a need for additional expertise to fill in the ecosystem aspects in the single stock summaries. This affects both the effects of fisheries on the ecosystem and the effects of ecosystem drivers on fish stocks. This would be the area of linkage between the ecosystem introduction and the single stock descriptions.

**AMAWGC recommendation:** when discussing the contents of the advisory report with the clients during the MICC meeting in April 2006, ICES should propose to change the display of short term implications of advice, to minimize the format for stocks on which we do not have information (e.g. Clyde herring).

## 7 Working group process and road- maps

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### 7.1 Discussion on a new WGNSSK timetable

The Chair of WGNSSK presented an analysis on the timing issues in the WGNSSK meetings. The WG deals with many stocks and is under close scrutiny by stakeholders and managers because it deals with a number of ‘high profile’ stocks. In the past, attempts to change the focus of the WG to issues of mixed fisheries and evaluations of management strategies have not been very successful because most of the time in the WG is still spent on doing annual single species assessments and forecasts. Much of the time spent on assessments can be considered as “fiddling” – that is, making minor modifications to model settings and parameters with aim of improving the model fit and usefulness. This leads to a contradiction. The diagnostics available in stock assessment models are seldom sufficient to determine which of many different possible combinations of settings leads to the “best” model, and the resultant changes are often not detectable within bounds of uncertainty. However, small changes in the outcomes of assessments can make big differences to stakeholders (fisheries managers, the fishing industry, and others).

The chair presented a new approach to WGNSSK this year where he intends to:

- define a clear cut-off point for data submission,
- carry out assessments prior to the meeting,
- promote probabilistic assessments and forecasts (see section 5.1)
- start and end the meeting with the ACFM summary sheets
- have focussed groups on strategy evaluation and mixed fisheries

In the discussion after the presentation, the AMAWGC raised a number of issues:

- the shifting of the workload in assessment WGs to the intersessional phase needs to be backed up by the ICES delegates. This can involve substantial additional costs on the institutes because they have to invest more manpower in the assessment process.
- the shifting from deterministic to probabilistic single species assessments and forecasts is likely to involve substantial additional work in the first years of implementation because the methods (how to do it) and the formats (how to present it) need to be developed and institutionalized.
- the system of benchmark, update, exploratory and observation list assessments has been in operation for a number of years now.
  - In some WGs the update assessments works fine, especially when there are no big errors apparent in the retrospective analysis of the model. However, other WGs report that they find it very difficult to operate with update assessments when the assessments and forecasts are sensitive to individual datapoints that are not adequately covered by the update assessment.
  - The exploratory assessments are considered problematic when WGs attempt to carry out some kind of assessments which is rejected by ACFM year after year. We concluded that the focus in the exploratory assessments should be on “exploratory” rather than on “assessment=VPA”. The question then becomes: “what kind of indicators do we have that would be useful in the management of that fish stock?” Effort trends? Age compositions? Mean length in the catches? Survey trends?

- The review system under ACFM should reflect the type of assessment that has been carried out. Update assessments only need update reviews. There needs to be an explicit guidance from ACFM to review groups on that issue.
- Seen from a fisheries system perspective: the change from the regular assessment practice to the system of benchmark and updates can be viewed as a change in the management strategy (“what is relevant knowledge”) that has not been thoroughly communicated with the fisheries managers and stakeholders and that has not been evaluated in terms of how that change would affect the quality of the advice.

#### Conclusions:

- The alternative time-table for the WGNSSK 2006 meeting is a useful trial to change the format of the meeting

#### Recommendations:

- ACFM needs to provide clear guidelines to review groups on how they should deal with different types of assessments: benchmark, update, exploratory, observation list.

## 7.2 Feedback from WKNEPH

WKNEPH met 24<sup>th</sup> –27<sup>th</sup> January 2006 to review how the integration of Nephrops assessments into area WGs during last year’s assessment round had worked. The group identified a number of areas in which they felt future improvements could be made. It was felt that the workloads of many of the assessment working groups were too great and that this was compounded by the inclusion of the nephrops stocks. Also, there was disappointment that the new groups were generally unable to devote enough time to wider issues and mixed fishery issues. However, it was generally agreed that the potential benefits of the new groups outweighed the early difficulties and that every opportunity should be given for them to ‘settle down’ and work out more efficient ways of meeting the TORs.

WKNEPH proposed a number of measures that could be taken to improve the efficiency of the groups. These included much earlier preparation of the data thus enabling assessments to be conducted in advance of the meeting and greater use of review groups during the meeting to address issues relating to a subset of stocks. It was stressed that the review groups should comprise a range of expertise and should be formed well in advance of the working group meeting to enable greater discussion of outputs and results. It was felt that there should be greater focus on the overall outcomes and what would be passed on to ACFM than a meeting dominated by producing the ‘perfect assessment’ which is in line with the recommendations by the chair of WGNSSK (section 7.1)

## 7.3 Generic terms of reference for assessment working groups

The ACFM action plan highlights the need to develop advice based on long term considerations on a fisheries basis and within an ecosystem approach. The following generic Terms of Reference specifies the tasks of assessment working groups in achieving the objectives of the action plan.

The following Terms of Reference are generic, and each individual assessment group should prioritise them according to the detailed planning developed by AMAWGC and the wishes of the group, in the full knowledge that not all ToRs can be achieved in full for all stocks.

WGNSSK, WGSSDS, WGHMM, WGMHSA, WGBFAS, WGNSDS, AFWG, HAWG, NWWG, WGNPBW and WGPAND will, in addition to the tasks listed by individual group in 2006:

- 4) based on input from e.g. WGRED and for the North Sea NORSEPP, consider existing knowledge on important environmental drivers for stock productivity and management and if such drivers are considered important for management advice incorporate such knowledge into assessment and prediction, and important impacts of fisheries on the ecosystem;
- 5) Evaluate existing management plans to the extent that they have not yet been evaluated. Develop options for management strategies including target reference points if management has not already agreed strategies or target reference points (or HCRs) and where it is considered relevant review limit reference points (and come forward with new ones where none exist) – following the guidelines from SGMAS (2005, 2006), AGLTA (2005) and AMAWGC (2004, 2005, and 2006); If mixed fisheries are considered important consider the consistence of options for target reference points and management strategies. If the WG is not in a position to perform this evaluation then identify the problems involved and suggest and initiate a process to perform the management evaluation;
- 6) where mixed catches are an important feature of the fisheries assess the influence of individual fleet activities on the stocks and the technical interactions;
- 7) update the description of fisheries exploiting the stocks, including major regulatory changes and their potential effects. Comment on the outcome of existing management measures including technical measures, TACs, effort control and management plans. The description of the fisheries should include an enumeration of the number, capacity and effort of vessels prosecuting the fishery by country;
- 8) where misreporting is considered significant provide qualitative and where possible quantitative information, for example from inspection schemes, on its distribution on fisheries and the methods used to obtain the information; document the nature of the information and its influence on the assessment and predictions.
- 9) provide for each stock and fishery information on discards (its composition and distribution in time and space) and the method used to obtain it. Describe how it has been considered in the assessments;
- 10) report as prescribed by the Secretariat on a national basis an overview of the sampling of the basic assessment data for the stocks considered;
- 11) provide specific information on possible deficiencies in the 2006 assessments including, at least, any major inadequacies in the data on landings, effort or discards; any major inadequacies in research vessel surveys data, and any major difficulties in model formulation; including inadequacies in available software. The consequences of these deficiencies for both the assessment of the status of the stocks and the projection should be clarified.
- 12) Further develop and implement the roadmap for medium and long term strategy of the group as developed by AMAWGC.
- 13) Working Group Chairs will set appropriate deadlines for submission of the basic assessment data. Data submitted after the deadline will be considered at a later meeting at the discretion of the WG Chair.

#### 7.4 Outstanding requests

The requests to ICES for 2006 are presented in Annex 5:

#### 7.5 Workload

WGs have been faced with substantial additional ToRs in recent years (e.g. mixed fisheries, ecosystem considerations, management evaluations). These are important new directions for ICES and its working group. The generic ToR 9 for working groups calls for a roadmap of how the WGs plan their activities with regards to the specific and generic ToRs. New terms of reference imply that traditional tasks need to be given lesser attention. Road-maps are a way to plan the development of the work in the WGs so that new ToRs can be included.

## 7.6 Road- maps for working groups

For each of the assessment working groups, a road-map has been developed which shows how the different terms of reference will be addressed in the coming three years. These road-maps will also be the basis for the work in the WG for 2006.

7.6.1 WGNSSK

Chair : Coby Needle

**Specific ToRs**

The standard benchmark/update approach to assessments will not be appropriate for WGNSSK for the next three years, as it does not allow time or space within the WG process to address the generic ToRs which are listed below and which are now viewed as priorities. Additionally, point estimates from update assessments have a tendency to fluctuate from year to year (these fluctuations may be driven by data noise than stock dynamics). On the other hand, it is the view of AMAWGC that attempting to switch all stock assessments to a probabilistic framework may be impractical because a) software is not quite ready, and b) such a new approach would entail considerable methodological development and thus also prevent consideration of the generic ToRs. AMAWGC have proposed a compromise in which two or three stocks are used as test cases for the probabilistic approach, while the rest will be viewed as updates in the traditional sense. This leaves unresolved the problem of those stocks for which no final assessment was agreed last year, but it may be advantageous if some of these are viewed as the probabilistic case studies.

A proposal for the type of assessments and forecasts that WGNSSK will do are as follows:

Stock	Area	Candidate assessments		Candidate forecasts	
Cod	IV, IIIa, VIId	No final assessment last year	ADAPT SPALY with bootstrapped uncertainty	Deterministic forecast	Probabilistic forecast
Haddock	IV, IIIa	XSA SPALY	Stochastic VPA	Deterministic forecast	Probabilistic forecast
Whiting	IV, VIId	No final assessment last year	Stochastic VPA	Deterministic forecast	Probabilistic forecast
Saithe	IV, VI, IIIa	XSA SPALY	Stochastic VPA	Deterministic forecast	Probabilistic forecast
Sole	IV	XSA SPALY	Stochastic VPA	Deterministic forecast	Probabilistic forecast
Sole	VIId	XSA SPALY	Stochastic VPA	Deterministic forecast	Probabilistic forecast
Plaice	IV	XSA SPALY	Stochastic VPA	Deterministic forecast	Probabilistic forecast
Plaice	IIIa	No final assessment last year	Stochastic VPA	Deterministic forecast	Probabilistic forecast
Plaice	VIId	No final assessment last year	Stochastic VPA	Deterministic forecast	Probabilistic forecast
Sandeel	IV	SXSA SPALY		Deterministic projection	
Norway pout	IV	SXSA SPALY		Deterministic projection	
Nephrops	All North Sea FUs	Abundance trends from TV surveys or LPUE		Harvest ratio estimation	

Assessment work is planned to be completed (largely) during the two months preceding the WG meeting. The time available for historical assessments during the meeting itself will be extremely limited, with a greater focus than previously on forecasts, ACFM summary sheets and generic ToRs..

### Generic ToRs

Term of reference (WGNSSK)	Year	Comments
(1) based on input from e.g. WGRED and for the North Sea NORSEPP, consider existing knowledge on important environmental drivers for stock productivity and management and if such drivers are considered important for management advice incorporate such knowledge into assessment and prediction, and important impacts of fisheries on the ecosystem;	????	WGRED has reported that lower growth rates may be expected in North Sea gadoids, implying pessimistic assumptions about weights-at-age in forecasts. Whether this can (or should) be implemented in WGNSSK depends on development of forecast methods to allow for uncertainty in weights, participation in the WG by environmental or ecosystem modelers, and clearer ideas about causal mechanisms. Until all three factors are in place, addressing this ToR is probably not feasible.
(2) Evaluate existing management plans to the extent that they have not yet been evaluated. Develop options for management strategies including target reference points if management has not already agreed strategies or target reference points (or HCRs) and where it is considered relevant review limit reference points (and come forward with new ones where none exist) – following the guidelines from SGMAS (2005, 2006), AGLTA (2005) and AMAWGC (2004, 2005, and 2006); If mixed fisheries are considered important consider the consistence of options for target reference points and management strategies. If the WG is not in a position to perform this evaluation then identify the problems involved and suggest and initiate a process to perform the management evaluation;	2006	AMAWGC has agreed that WGNSSK will undertake an evaluation of the current management plans for North Sea cod and haddock, and Northern Shelf saithe, following the approach outlined by SGMAS. This should be possible if participants can be identified in good time, and if said participants are not also required to do stock assessment.
(3) where mixed catches are an important feature of the fisheries assess the influence of individual fleet activities on the stocks and the technical interactions;	2006-????	Following the conclusion of WKMIXMAN, WGNSSK will be performing a “dry run” of the F <sup>3</sup> software as applied to the North Sea. This will be restricted to the current (early 2006) implementation of the method. After this exercise, the approach will be evaluated and a decision made about using it to provide advice. Further development (2007 and beyond) should include the use of probabilistic single-stock forecasts as a basis for mixed-fishery forecasts.
(4) update the description of fisheries exploiting the stocks, including major regulatory changes and their potential effects. Comment on the outcome of existing management measures including technical measures, TACs, effort control and management plans. The description of the fisheries should include an enumeration of the number, capacity and effort of vessels prosecuting the fishery by country;	2006-2008	North Sea fisheries are in sufficient flux to make this an annual requirement. Members of WGFTFB have expressed willingness to join the WGNSSK meeting to update this information (2006-2008). The WG will not be able to comment on the outcome of existing management measures in the short term, but will plan to do so in 2008. Vessel enumeration will be done as part of data collation (2006-2008).

<b>Term of reference (WGNSSK)</b>	<b>Year</b>	<b>Comments</b>
(5) where misreporting is considered significant provide qualitative and where possible quantitative information, for example from inspection schemes, on its distribution on fisheries and the methods used to obtain the information; document the nature of the information and its influence on the assessment and predictions.	2006-2008	Quantitative information on misreporting is not available in the North Sea. In 2005 the North Sea cod assessment estimated unrecorded removals, but these could not be interpreted as misreporting. The WG will make qualitative statements on the presence or absence of misreporting in different fisheries, along with general sources of information and its quality.
(6) provide for each stock and fishery information on discards (its composition and distribution in time and space) and the method used to obtain it. Describe how it has been considered in the assessments;	2006-2008	Discard data will be collated along with other commercial data, with a final submission data of July 1 <sup>st</sup> . The historical reconstruction of discard data will continue for those stocks where it is necessary.
(7) report as prescribed by the Secretariat on a national basis an overview of the sampling of the basic assessment data for the stocks considered;	2006-2008	Summary tables will be completed by stock coordinators before the WG meeting.
(8) provide specific information on possible deficiencies in the 2006 assessments including, at least, any major inadequacies in the data on landings, effort or discards; any major inadequacies in research vessel surveys data, and any major difficulties in model formulation; including inadequacies in available software. The consequences of these deficiencies for both the assessment of the status of the stocks and the projection should be clarified.	2006-2008	This ToR is covered in each of the stock sections, each of which will also contain comparisons with previous assessments (this indicates assessment quality).
(9) Further develop and implement the roadmap for medium and long term strategy of the group as developed by AMAWGC.	2006-2008	Done in this table.
(10) Working Group Chairs will set appropriate deadlines for submission of the basic assessment data. Data submitted after the deadline will be considered at a later meeting at the discretion of the WG Chair.	2006-2008	A deadline has been set for July 1 <sup>st</sup> , which will be communicated to the WG in the near future. The inclusion of survey data made available after that date will be allowed, as long as the assessment process is sufficiently automated that this inclusion will be very rapid.



## 7.6.2 WGSSDS

Chair : Wim Demaré

**Specific ToRs**

Look for information on the stock structure of Channel plaice stocks – 2006 – High priority

**Generic ToRs**

<b>Term of reference (WGSSDS)</b>	<b>Year</b>	<b>Comments</b>
(1) based on input from e.g. WGRED and for the North Sea NORSEPP, consider existing knowledge on important environmental drivers for stock productivity and management and if such drivers are considered important for management advice incorporate such knowledge into assessment and prediction, and important impacts of fisheries on the ecosystem;	Not for 2006	Low priority Await the evolutions in this field. Currently no environmental drivers have been identified by WGRED for stocks dealt with in the WGSSDS.
(2) Evaluate existing management plans to the extent that they have not yet been evaluated. Develop options for management strategies including target reference points if management has not already agreed strategies or target reference points (or HCRs) and where it is considered relevant review limit reference points (and come forward with new ones where none exist) – following the guidelines from SGMAS (2005, 2006), AGLTA (2005) and AMAWGC (2004, 2005, and 2006); If mixed fisheries are considered important consider the consistence of options for target reference points and management strategies. If the WG is not in a position to perform this evaluation then identify the problems involved and suggest and initiate a process to perform the management evaluation;	2006/2007/2008	Low priority Currently no explicit management plans are in place. However some management plans are in development (e.g. Bay of Biscay sole and Celtic Sea cod). The WG will not address this issue in detail in 2006, but might touch on it depending on the time that is still available. Evaluate management plans (if any) that are in place in 2007 and 2008.
(3) where mixed catches are an important feature of the fisheries assess the influence of individual fleet activities on the stocks and the technical interactions;	2006/2007	High priority 2006: Start to compile information on the catch composition for the different fisheries, but no assessment. 2007: Depending on the development of e.g. the F <sup>3</sup> model start assessments.
(4) update the description of fisheries exploiting the stocks, including major regulatory changes and their potential effects. Comment on the outcome of existing management measures including technical measures, TACs, effort control and management plans. The description of the fisheries should include an enumeration of the number, capacity and effort of vessels prosecuting the fishery by country;	2006	High priority In collaboration with FTFB

<b>Term of reference (WGSSDS)</b>	<b>Year</b>	<b>Comments</b>
(5) where misreporting is considered significant provide qualitative and where possible quantitative information, for example from inspection schemes, on its distribution on fisheries and the methods used to obtain the information; document the nature of the information and its influence on the assessment and predictions.	2006	High priority It might be difficult to provide this information because of 'confidentially' issues.
(6) provide for each stock and fishery information on discards (its composition and distribution in time and space) and the method used to obtain it. Describe how it has been considered in the assessments;	2006/2007	High priority Start to compile discard data in 2006 (especially on age since length data are already provided) but probably to soon to incorporate in the assessment. Discuss with the WG if and how these data should be incorporated in the 2007 assessments.
(7) report as prescribed by the Secretariat on a national basis an overview of the sampling of the basic assessment data for the stocks considered;	2006	
(8) provide specific information on possible deficiencies in the 2006 assessments including, at least, any major inadequacies in the data on landings, effort or discards; any major inadequacies in research vessel surveys data, and any major difficulties in model formulation; including inadequacies in available software. The consequences of these deficiencies for both the assessment of the status of the stocks and the projection should be clarified.	2006	
(9) Further develop and implement the roadmap for medium and long term strategy of the group as developed by AMAWGC.	2006	
(10) Working Group Chairs will set appropriate deadlines for submission of the basic assessment data. Data submitted after the deadline will be considered at a later meeting at the discretion of the WG Chair.	2006	Currently the deadline has been set for the beginning of May 2006, but there are no 'penalties' set for data that will be delivered after the deadline.

## 7.6.3 WGHMM

Chair : Manuela Azevedo

## Generic ToRs

Term of reference (WGHMM)	Year	Comments
(1) based on input from e.g. WGRED and for the North Sea NORSEPP, consider existing knowledge on important environmental drivers for stock productivity and management and if such drivers are considered important for management advice incorporate such knowledge into assessment and prediction, and important impacts of fisheries on the ecosystem;	2006 (P3) 2007 (P1) 2008 (P2)	The current knowledge on ecological factors and environmental conditions impacting on the stocks dynamics and productivity is still very limited. In 2006, only updating ecosystem sections. P1 in 2007 possibly using southern hake stock..
(2) Evaluate existing management plans to the extent that they have not yet been evaluated. Develop options for management strategies including target reference points if management has not already agreed strategies or target reference points (or HCRs) and where it is considered relevant review limit reference points (and come forward with new ones where none exist) – following the guidelines from SGMAS (2005, 2006), AGLTA (2005) and AMAWGC (2004, 2005, and 2006); If mixed fisheries are considered important consider the consistence of options for target reference points and management strategies. If the WG is not in a position to perform this evaluation then identify the problems involved and suggest and initiate a process to perform the management evaluation;	2006 (P1) 2007 (P2) 2008 (P3)	Evaluation of management plans (RPlan) for 2 stocks (north and south hake): considered of priority 1 in 2006 Possibly evaluation of management plan (RP) of Nephrops MA Q (FU 28-29) in 2007 Extending the evaluation of management plans to other stocks in 2008
(3) where mixed catches are an important feature of the fisheries assess the influence of individual fleet activities on the stocks and the technical interactions;	2006 (P2) 2007 (P3) 2008 (P1)	2006: testing the applicability of the $F^3$ approach (not yet clear to what extent) Expecting that mixed fisheries approach is further developed and tested it will be given high priority in 2008 (P1)
(4) update the description of fisheries exploiting the stocks, including major regulatory changes and their potential effects. Comment on the outcome of existing management measures including technical measures, TACs, effort control and management plans. The description of the fisheries should include an enumeration of the number, capacity and effort of vessels prosecuting the fishery by country;	2006 (P3) 2007 (P2) 2008 (P1)	In 2006 some improvement in the detailed information regarding number of vessels and effort is expected, as a result of the information to be compiled to test the Fcube approach for mixed fisheries forecast. Improved description in 2008 making the link with the higher priority given to ToR 3 also in 2008.

Term of reference (WGHMM)	Year	Comments
(5) where misreporting is considered significant provide qualitative and where possible quantitative information, for example from inspection schemes, on its distribution on fisheries and the methods used to obtain the information; document the nature of the information and its influence on the assessment and predictions.		Don't have it clear yet: importance of this ToR will be discussed during 2006 WGHMM meeting.
(6) provide for each stock and fishery information on discards (its composition and distribution in time and space) and the method used to obtain it. Describe how it has been considered in the assessments;	2006 (P3) 2007 (P2) 2008 (P1)	2006: provide discard data for southern hake stock. Updates for the remaining stocks with discard sampling data.  2007: discussion on methods to reconstruct discarding data (can we expect input on this issue from WGMG, PGCCDBS ?).  2008: Assessments incorporating discard data.
(7) report as prescribed by the Secretariat on a national basis an overview of the sampling of the basic assessment data for the stocks considered;		Will continue to be a common procedure.
(8) provide specific information on possible deficiencies in the 2006 assessments including, at least, any major inadequacies in the data on landings, effort or discards; any major inadequacies in research vessel surveys data, and any major difficulties in model formulation; including inadequacies in available software. The consequences of these deficiencies for both the assessment of the status of the stocks and the projection should be clarified.		This is done annually in each stock section.
(9) Further develop and implement the roadmap for medium and long term strategy of the group as developed by AMAWGC.	2006 (P3) 2007 (P1) 2008 (P2)	No major advances expected this year hence P3 given for 2006. The preliminary planning for this ToR (P1 in 2007 and P2 in 2008) will be discussed during the 2006 WGHMM meeting.
(10) Working Group Chairs will set appropriate deadlines for submission of the basic assessment data. Data submitted after the deadline will be considered at a later meeting at the discretion of the WG Chair.		This is already a common procedure in WGHMM. The final date for data submission is usually 1.5-2 months before the meeting. Preliminary assessments are usually presented in the first days of the WG meeting.

#### 7.6.4 WGMHSA

Working Group : WGMHSA

Chair : Ciaran Kelly

##### Specific ToRs

The 2006 specific terms of reference for the WGMHSA remain as in 2005, i.e. assess the status and provide management options for the main mackerel, horse mackerel, sardine and anchovy stocks. This will be addressed as in previous years with regard to the road map laid out under the generic ToR's below. The WGMHSA have provided probabilistic forecasts for anchovy and mackerel, and will continue to do this in 2006 and beyond. The specific terms of reference given in section 2005/2/ACFM14 are in contradiction to what is planned for benchmark and update assessments, both in 2005 and 2006. Specifically a benchmark assessment was done for Anchovy in Biscay in 2005, and this is listed for benchmark again in 2006. Sardine in VIIc and IXa is due for benchmark in 2006 but 2005/2/ACFM14 refers to in depth exploratory analysis for anchovy and sardine in VIII, this would include sardine currently not assessed and a subset of the VIIIc IXa stock. Given the current critical status of the Anchovy stock in Biscay, and the fact that the major sardine stock (VIIIc IXa) is due for a benchmark this year (also the results of SARDYN are available), the WGMHSA proposes to continue the in-depth exploratory analysis for anchovy in Biscay and to attempt a benchmark assessment for Sardine in 2006.

##### Generic ToRs

Term of reference	Year	Comments
(11) assess the status of and provide management options for 2006 for the stocks of mackerel, sardine stock in Divisions VIIIc and IXa, western horse mackerel, southern horse mackerel, anchovy in Subarea VIII and anchovy in Division IXa;	2006	Standard ToR will be addressed in terms of Benchmark for Sardine and Anchovy, update for Mackerel and experimental for all others
(12) carry out in-depth exploratory assessments for sardine and anchovy in Subarea VIII;	2006	Emphasis on Sardine and anchovy assessments, further information on Sardine in VIIIa to be collated
(13) for the stocks mentioned in a) perform the tasks described in C.Res.2005/2/ACFM01.		This is a procedure, addressed each year.



Term of reference	Year	Comments
<p>(17) update the description of fisheries exploiting the stocks, including major regulatory changes and their potential effects. Comment on the outcome of existing management measures including technical measures, TACs, effort control and management plans. The description of the fisheries should include an enumeration of the number, capacity and effort of vessels prosecuting the fishery by country;</p>	2006	Fleet descriptions updated on a 3 year cycle already. WGMHSA intends to deal with this term of reference more thoroughly in 2006, through the participation of member(s) from WGFTFB.
	2007	By 2007 the advance in CAFE project should benefit the comprehension between fleets, effort and fishing mortality in the anchovy fishery.
<p>(18) where misreporting is considered significant provide qualitative and where possible quantitative information, for example from inspection schemes, on its distribution on fisheries and the methods used to obtain the information; document the nature of the information and its influence on the assessment and predictions.</p>	2006	Incomplete misreporting estimates are included where available. In 2006 this information will be augmented through participation of member from WGFTFB.
	2007	Issues raised through the investigation in 2006 will be followed up
<p>(19) provide for each stock and fishery information on discards (its composition and distribution in time and space) and the method used to obtain it. Describe how it has been considered in the assessments;</p>	2006	Incomplete discarding estimates are included where available. In 2006 this information will be augmented through participation of member from WGFTFB.
	2007	Issues raised through the investigation in 2006 will be followed up
<p>(20) report as prescribed by the Secretariat on a national basis an overview of the sampling of the basic assessment data for the stocks considered;</p>	2006	The table template sent by the secretariat has been amended and completed since 2005. This will continue in 2006 and beyond.
<p>(21) provide specific information on possible deficiencies in the 2006 assessments including, at least, any major inadequacies in the data on landings, effort or discards; any major inadequacies in research vessel surveys data, and any major difficulties in model formulation; including inadequacies in available software. The consequences of these deficiencies for both the assessment of the status of the stocks and the projection should be clarified.</p>	2006	Deficiencies in input commercial and survey data already noted as part of 2005 report. Work will continue in 2006 to address these deficiencies. Information on discarding in mackerel and horse mackerel to be augmented in 2006 through participation of member from WGFTFB.
	2007	Consequences of deficiencies on assessment to be taken up in Benchmark years, 2004 Mackerel, 2005 Anchovy, 2006 Sardine, 2007 Horse mackerel

<b>Term of reference</b>	<b>Year</b>	<b>Comments</b>
(22) Further develop and implement the roadmap for medium and long term strategy of the group as developed by AMAWGC.	2006	
(23) Working Group Chairs will set appropriate deadlines for submission of the basic assessment data. Data submitted after the deadline will be considered at a later meeting at the discretion of the WG Chair.	2006	System already implemented, 100% compliance amongst countries which supply data.



### 7.6.5 WGBFAS

Chair : Tomas Gröhsler

#### **Specific ToRs**

##### **2005/2/ACFM05: The Baltic Fisheries Assessment Working Group [WGBFAS]:**

a) assess the status of and provide management options for year 2007, for cod, herring and sprat stocks in the Baltic, and cod in Kattegat and sole in Division IIIa by appropriate areas\* and stock components and taking into account the biological interaction between species. The options should be for a range of fishing mortalities, including those implied by agreed management plans.

\*Areas:

#### **Baltic Herring:**

1. SD 22-24 (based on assessment made by HAWG)
2. SD 25-29, 32 excluding Gulf of Riga (25-27, 28.2, 29 and 32)
3. Gulf of Riga (28.1)
4. SD 30
5. SD 31

#### **Sprat:**

1. The Whole Baltic: SD 22-32

#### **Sole:**

1. Division IIIa.

#### **Cod:**

1. SD 22-24
2. SD 25-32
3. Kattegat

- b) provide any new information on the state of flatfish stocks in the Baltic;
- c) consider assessments and management options which include information on landings, discards and fishing mortality rates by fisheries (defined by gear types and mesh sizes) including the pelagic fisheries.
- d) for the stocks mentioned in a) perform the tasks described in **C.Res.2005/2/ACFM01**.

**Assessment classification for 2006:**

Observation list	Benchmark	Update	Experimental	No Assessment
<ul style="list-style-type: none"> <li>• Cod SD 25-32,</li> <li>• Cod Kattegat</li> <li>• Sole Division IIIa</li> </ul>	<ul style="list-style-type: none"> <li>• Herring SD 30</li> </ul>	<ul style="list-style-type: none"> <li>• Cod SD 22-24,</li> <li>• Herring SD 25-29&amp;32 excl. GoR</li> <li>• Herring Gulf of Riga (GoR)</li> <li>• Herring SD 31</li> <li>• Sprat SD 22-32</li> </ul>	<ul style="list-style-type: none"> <li>• Flounder SD 24-25</li> </ul>	<ul style="list-style-type: none"> <li>• Plaice, Dab, Turbot, Brill</li> </ul>

**Comment on ToR c):** Information on landings, discards and fishing mortality rates by fisheries (defined by gear types and mesh sizes) including the pelagic fisheries strongly dependant one input of the Baltic Regional PG (fleet definitions and corresponding catches).

Generic ToRs

Term of reference	Year	Comments
(24)based on input from e.g. WGRED and for the North Sea NORSEPP, consider existing knowledge on important environmental drivers for stock productivity and management and if such drivers are considered important for management advice incorporate such knowledge into assessment and prediction, and important impacts of fisheries on the ecosystem;	2006-2008	Update of the already implemented chapter on recent environmental conditions in the Baltic Sea relevant to fish stock assessment. Focus on possible resulting drivers.

Term of reference	Year	Comments
(25) Evaluate existing management plans to the extent that they have not yet been evaluated. Develop options for management strategies including target reference points if management has not already agreed strategies or target reference points (or HCRs) and where it is considered relevant review limit reference points (and come forward with new ones where none exist) – following the guidelines from SGMAS (2005, 2006), AGLTA (2005) and AMAWGC (2004, 2005, and 2006); If mixed fisheries are considered important consider the consistence of options for target reference points and management strategies. If the WG is not in a position to perform this evaluation then identify the problems involved and suggest and initiate a process to perform the management evaluation;		All existing management plans have been evaluated by ICES.
(26) where mixed catches are an important feature of the fisheries assess the influence of individual fleet activities on the stocks and the technical interactions;	2007-2008	Mixed catches are considered of minor importance for the fisheries in the Baltic Sea. There is a problem in getting precise estimates of the catch composition in the mixed herring/sprat fisheries.  Fleet definitions and corresponding catches are under preparation by the Baltic Regional PG.
(27) update the description of fisheries exploiting the stocks, including major regulatory changes and their potential effects. Comment on the outcome of existing management measures including technical measures, TACs, effort control and management plans. The description of the fisheries should include an enumeration of the number, capacity and effort of vessels prosecuting the fishery by country;	2006-2008  2007-2008	Update of the description of fisheries, which was already implemented as a routine task.  Cod in SD 22-24 & Cod in SD 25-32: Evaluation of introducing a new survey design for the IBTS & new gear (BACOMA).
(28) where misreporting is considered significant provide qualitative and where possible quantitative information, for example from inspection schemes, on its distribution on fisheries and the methods used to obtain the information; document the nature of the information and its influence on the assessment and predictions.	2006-2008  2006	Update of the routine task, quantitatively implemented for the cod stock in SD 25-32. Misreporting issues were extensively included in the IIIa sole assessment.  Evaluation of misreporting of Kattegat cod is expected at the coming WG meeting.

Term of reference	Year	Comments
(29) provide for each stock and fishery information on discards (its composition and distribution in time and space) and the method used to obtain it. Describe how it has been considered in the assessments;	2006-2008	Update of the routine task, quantitatively already implemented for the cod stocks in SD 22-24 & SD 25-32. It is planned to include discard data in the assessment for the cod stock in the Kattegat in 2006.
(30) report as prescribed by the Secretariat on a national basis an overview of the sampling of the basic assessment data for the stocks considered;	2006-2008	Update, already implemented as a routine task.
(31) provide specific information on possible deficiencies in the 2006 assessments including, at least, any major inadequacies in the data on landings, effort or discards; any major inadequacies in research vessel surveys data, and any major difficulties in model formulation; including inadequacies in available software. The consequences of these deficiencies for both the assessment of the status of the stocks and the projection should be clarified.	2006-2008	Update, already implemented as a routine task.
(32) Further develop and implement the roadmap for medium and long term strategy of the group as developed by AMAWGC.	2007-2008	To be discussed during the WG meeting in 2006.
(33) Working Group Chairs will set appropriate deadlines for submission of the basic assessment data. Data submitted after the deadline will be considered at a later meeting at the discretion of the WG Chair.	2006-2008	We had this system for some time.

7.6.6 WGNSDS

Chair : Robert Scott

**Specific ToRs**

Term of reference	Year	Comments																		
(1) Assess the status of and provide management options for the year 2007 for the stocks of cod, haddock, whiting, anglerfish and megrim in Subarea VI, for cod, haddock, whiting, plaice, sole in Division VIIa and Nephrops Functional units 11, 12, 13, 14, and 15 and for anglerfish stocks in Subarea IV and Divisions IIa, IIIa, and VIa	2006	Observation List : Via Cod, VIIa Cod  Experimental: Everything else except Megrim (no assessment)																		
(2) The NEAFC Commission requests ICES to provide information on the effect of the Rockall box:  <table border="0" data-bbox="224 821 739 1029"> <tr> <td>Point no.</td> <td>Latitude</td> <td>Longitude</td> </tr> <tr> <td>1</td> <td>57° 000 N</td> <td>15° 000 W</td> </tr> <tr> <td>2</td> <td>57° 000 N</td> <td>14° 700 W</td> </tr> <tr> <td>3</td> <td>56° 575 N</td> <td>14° 327 W</td> </tr> <tr> <td>4</td> <td>56° 500 N</td> <td>14° 450 W</td> </tr> <tr> <td>5</td> <td>56° 500 N</td> <td>15° 000 W</td> </tr> </table> in protecting juvenile haddock and possible revisions of the boundary of the box.	Point no.	Latitude	Longitude	1	57° 000 N	15° 000 W	2	57° 000 N	14° 700 W	3	56° 575 N	14° 327 W	4	56° 500 N	14° 450 W	5	56° 500 N	15° 000 W	2006	The work to answer this request should be completed prior to the WG meeting.  Possibility of specific meeting prior to the working group to discuss Rockall Haddock. Data have been collected that may enable a response to the request.
Point no.	Latitude	Longitude																		
1	57° 000 N	15° 000 W																		
2	57° 000 N	14° 700 W																		
3	56° 575 N	14° 327 W																		
4	56° 500 N	14° 450 W																		
5	56° 500 N	15° 000 W																		

**Generic ToRs (WGNSDS)**

Term of reference (WGNSDS)	Year	Comments
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Term of reference (WGNSDS)	Year	Comments
<p>(1) based on input from e.g. WGRED and for the North Sea NORSEPP, consider existing knowledge on important environmental drivers for stock productivity and management and if such drivers are considered important for management advice incorporate such knowledge into assessment and prediction, and important impacts of fisheries on the ecosystem;</p>	2007-8	<p>No specific recommendations from WGRED to NOSH. Information on environmental drivers in Northern Shelf waters is limited. May be possible to add to the information provided last year by NOSH to WGRED.</p> <p>Low priority for 2006 WG except for stocks where evaluation of management strategies requires scenarios of altered stock productivity related to trends in environmental conditions.</p>
<p>(2) Evaluate existing management plans to the extent that they have not yet been evaluated. Develop options for management strategies including target reference points if management has not already agreed strategies or target reference points (or HCRs) and where it is considered relevant review limit reference points (and come forward with new ones where none exist) – following the guidelines from SGMAS (2005, 2006), AGLTA (2005) and AMAWGC (2004, 2005, and 2006); If mixed fisheries are considered important consider the consistence of options for target reference points and management strategies. If the WG is not in a position to perform this evaluation then identify the problems involved and suggest and initiate a process to perform the management evaluation;</p>	2006	<p>High priority for 2006: West of Scotland Cod and Irish Sea Cod.</p> <p>Exact approach unclear as there is no current accepted assessment. Similar management plans for these stocks have already been evaluated in 2003. The extent of additional evaluations needs to be discussed.</p> <p>Requires that some preparatory work (at least) is done prior to the WG meeting.</p>
<p>(3) where mixed catches are an important feature of the fisheries assess the influence of individual fleet activities on the stocks and the technical interactions;</p>	2007	<p>Medium priority for 2006. Not done last year. Mixed fisheries issues important. Data have been compiled for previous years.</p> <p>Without agreed assessments and forecasts such issues are difficult to take into account but are important considerations in management strategy evaluations.</p> <p>Dry run of F3 model to be undertaken by WGNSSK in 2006.</p>
<p>(4) update the description of fisheries exploiting the stocks, including major regulatory changes and their potential effects. Comment on the outcome of existing management measures including technical measures, TACs, effort control and management plans. The description of the fisheries should include an enumeration of the number, capacity and effort of vessels prosecuting the fishery by country;</p>	2007-8	<p>Medium - high priority for 2006</p> <p>Addressed by last year's WG. The status of the fisheries have probably not changed sufficiently to require a major update of this section. However, given recent ACFM advice for some stocks of "no increase in effort" quantitative information on effort levels and fishery descriptions are of high importance.</p>

Term of reference (WGNSDS)	Year	Comments
(5) where misreporting is considered significant provide qualitative and where possible quantitative information, for example from inspection schemes, on its distribution on fisheries and the methods used to obtain the information; document the nature of the information and its influence on the assessment and predictions.	2006	<p>High priority for 2006</p> <p>Addressed by last year's WG but will need to be considered on an annual basis. It is important to justify the use of catch data where there is considered to be substantial unknown bias.</p> <p>The chair of WGFTFB will be invited to attend the first week of the WG meeting.</p>
(6) provide for each stock and fishery information on discards (its composition and distribution in time and space) and the method used to obtain it. Describe how it has been considered in the assessments;	2006	High importance for some stocks. Historical back-calculation of discards and data raising methods are relevant issues. Other groups at ICES involved with this.
(7) report as prescribed by the Secretariat on a national basis an overview of the sampling of the basic assessment data for the stocks considered;	2006-8	Done last year. Table completed at the working group, similar approach may be adopted this year.
(8) provide specific information on possible deficiencies in the 2006 assessments including, at least, any major inadequacies in the data on landings, effort or discards; any major inadequacies in research vessel surveys data, and any major difficulties in model formulation; including inadequacies in available software. The consequences of these deficiencies for both the assessment of the status of the stocks and the projection should be clarified.	2006-8	<p>Done last year</p> <p>Separate section or stock specific sections?</p>
(9) Further develop and implement the roadmap for medium and long term strategy of the group as developed by AMAWGC.	2006	<p>High priority for 2006</p> <p>Long term issues important for this group as it struggles to provide a basis for management advice in the current context.</p>
(10) Working Group Chairs will set appropriate deadlines for submission of the basic assessment data. Data submitted after the deadline will be considered at a later meeting at the discretion of the WG Chair.		Will discuss during this year's WG meeting to determine most appropriate approach

## 7.6.7 AFWG

Chair : Yuri Kovalev

**Specific ToRs**

- a) assess the status of and provide management options for the year 2007 for the stocks of cod, haddock, saithe, Greenland halibut, and redfish in Subareas I and II, taking into account interactions with other species;
- b) update the data files on Barents Sea capelin and oversee the process of providing inter-sessional assessment and predictions on the stock;
- c) for the stocks mentioned in a) and b) perform the tasks described in C.Res. 2005/2/ACFM01.

**Generic ToRs**

Term of reference (AFWG)	Year	Comments
(1) based on input from e.g. WGRED and for the North Sea NORSEPP, consider existing knowledge on important environmental drivers for stock productivity and management and if such drivers are considered important for management advice incorporate such knowledge into assessment and prediction, and important impacts of fisheries on the ecosystem;	yearly	A number of approaches already have been presented to the group and/or implemented in assessment and prediction. There are different ecosystem factors taking into account for prediction and/or assessment of growth, recruitment, maturation and mortality. The Group keep using alternative approaches together with ones previously used in order to collect data series of quality of prediction and accuracy of assessment.
(2) Evaluate existing management plans to the extent that they have not yet been evaluated. Develop options for management strategies including target reference points if management has not already agreed strategies or target reference points (or HCRs) and where it is considered relevant review limit reference points (and come forward with new ones where none exist) – following the guidelines from SGMAS (2005, 2006), AGLTA (2005) and AMAWGC (2004, 2005, and 2006); If mixed fisheries are considered important consider the consistence of options for target reference points and management strategies. If the WG is not in a position to perform this evaluation then identify the problems involved and suggest and initiate a process to perform the management evaluation;	2006	The evaluation of HCR and revision of reference points for NEA haddock will be done by WKHAD (A Workshop on Biological Reference Points for Northeast Arctic Haddock). The results will be reviewed by AFWG in 2006 meeting.
(3) where mixed catches are an important feature of the fisheries assess the influence of individual fleet activities on the stocks and the technical interactions;	yearly	Low priority There is no requests from client (JRNC). The general observation of the problem have been done in 2005 report.



Term of reference (AFWG)	Year	Comments
(4) update the description of fisheries exploiting the stocks, including major regulatory changes and their potential effects. Comment on the outcome of existing management measures including technical measures, TACs, effort control and management plans. The description of the fisheries should include an enumeration of the number, capacity and effort of vessels prosecuting the fishery by country;	done	Description of fisheries is presented in Quality Handbooks.
(5) where misreporting is considered significant provide qualitative and where possible quantitative information, for example from inspection schemes, on its distribution on fisheries and the methods used to obtain the information; document the nature of the information and its influence on the assessment and predictions.	yearly	At recent AFWG meetings it has been recognized that there is growing evidence of both substantial discarding and mis-reporting of catches throughout the Barents Sea for most groundfish stocks in recent years. Estimates of NEA cod unreported landings in 2002-2004 included into the assessment. The information has been presented to the Group several times but not on the regular basis. There are needs for plane of regular data collection.
(6) provide for each stock and fishery information on discards (its composition and distribution in time and space) and the method used to obtain it. Describe how it has been considered in the assessments;	yearly	The information has been presented to the Group several times but not on the regular basis. The total effect of the discarding is still very unclear and requires more work before it can be included in the assessments. There are needs for plane of regular data collection.
(7) report as prescribed by the Secretariat on a national basis an overview of the sampling of the basic assessment data for the stocks considered;	2006-2007	
(8) provide specific information on possible deficiencies in the 2006 assessments including, at least, any major inadequacies in the data on landings, effort or discards; any major inadequacies in research vessel surveys data, and any major difficulties in model formulation; including inadequacies in available software. The consequences of these deficiencies for both the assessment of the status of the stocks and the projection should be clarified.	yearly	
(9) Further develop and implement the roadmap for medium and long term strategy of the group as developed by AMAWGC.	2006	
(10) Working Group Chairs will set appropriate deadlines for submission of the basic assessment data. Data submitted after the deadline will be considered at a later meeting at the discretion of the WG Chair.	2006	The deadline for catch data submission has been set as 1 <sup>st</sup> April; NEA cod survey deadline is the first day of the AFWG meeting.

### 7.6.8 HAWG

Working Group : HAWG

Chair : Mark Dickey-Collas

#### Specific ToRs

Specific terms of Reference 2005/2/2ACFM03 The Herring Assessment Working Group south of 62° N [HAWG]:

- a) assess the status of and provide management options (by fleet where possible) for 2007 for:
  - i) the North Sea autumn-spawning herring stock in Division IIIa, Sub-area IV, and Division VIIId (separately, if possible, for Divisions IVc and VIIId);
  - ii) the herring stocks in Division VIa and Sub-area VII;
  - iii) the stock of spring-spawning herring in Division IIIa and Subdivisions 22 24 (Western Baltic);
- b) forecasts for North Sea autumn-spawning herring should be provided by fleet and according to the management plan agreed between the EU and Norway;
- c) catch options for Div. IIIa shall be given by fleets taking into account that North Sea herring and Western Baltic herring are taken together in this Division;
- d) assess the status of the sprat stocks in Subarea IV and Divisions IIIa and VIIId,e;
- e) for the stocks mentioned in a) and d) perform the tasks described in C.Res. 2005/2/ACFM01.

An update approach should be taken for all stocks that have agreed assessments, except for North Sea autumn-spawning herring which should be a bench-mark assessment. Exploratory assessments will be carried out on Irish Sea, IVaS and Celtic Sea herring. No time will be spent on Clyde herring and VIIId,e sprat as no additional data or investigations have been made available in 2005 and 2006.

Term of reference (HAWG)	Year	Comments
(1) based on input from e.g. WGRED and for the North Sea NORSEPP, consider existing knowledge on important environmental drivers for stock productivity and management and if such drivers are considered important for management advice incorporate such knowledge into assessment and prediction, and important impacts of fisheries on the ecosystem;	2006-08	This will be taken into the benchmark assessment of North Sea herring, in light of SGRECVAP. The stocks to the west of the area will be investigated in the years to come.

Term of reference (HAWG)	Year	Comments
(2) Evaluate existing management plans to the extent that they have not yet been evaluated. Develop options for management strategies including target reference points if management has not already agreed strategies or target reference points (or HCRs) and where it is considered relevant review limit reference points (and come forward with new ones where none exist) – following the guidelines from SGMAS (2005, 2006), AGLTA (2005) and AMAWGC (2004, 2005, and 2006); If mixed fisheries are considered important consider the consistence of options for target reference points and management strategies. If the WG is not in a position to perform this evaluation then identify the problems involved and suggest and initiate a process to perform the management evaluation;	2007	There are 2 outstanding management plans that are yet to be evaluated; it is proposed to carry this out in 2007, as the scientists with experience and expertise feel that another year is required to evaluate the plan within the SGMAS context.
(3) where mixed catches are an important feature of the fisheries assess the influence of individual fleet activities on the stocks and the technical interactions;	2008	Not considered of high importance for the fisheries covered by HAWG.
(4) update the description of fisheries exploiting the stocks, including major regulatory changes and their potential effects. Comment on the outcome of existing management measures including technical measures, TACs, effort control and management plans. The description of the fisheries should include an enumeration of the number, capacity and effort of vessels prosecuting the fishery by country;	2008	This is a large job, and the WG needs preparation time.
(5) where misreporting is considered significant provide qualitative and where possible quantitative information, for example from inspection schemes, on its distribution on fisheries and the methods used to obtain the information; document the nature of the information and its influence on the assessment and predictions.	2006	This will be broadly described in the report.
(6) provide for each stock and fishery information on discards (its composition and distribution in time and space) and the method used to obtain it. Describe how it has been considered in the assessments;	2006	This will be carried out in 2006.
(7) report as prescribed by the Secretariat on a national basis an overview of the sampling of the basic assessment data for the stocks considered;	2006	To fill in form provided by the secretariat is a small job.

Term of reference (HAWG)	Year	Comments
(8) provide specific information on possible deficiencies in the 2006 assessments including, at least, any major inadequacies in the data on landings, effort or discards; any major inadequacies in research vessel surveys data, and any major difficulties in model formulation; including inadequacies in available software. The consequences of these deficiencies for both the assessment of the status of the stocks and the projection should be clarified.	2006	This is considered a generic part of the assessment process for each stock. It will be carried out in detail for the North Sea herring in 2006, but more generic for the other stocks as they are update assessments.
(9) Further develop and implement the roadmap for medium and long term strategy of the group as developed by AMAWGC.	2006	This is being developed, with 2006 looking at the North Sea, and 2007 looking at western stocks, and 2008 looking at IIIa. In 2007, the WG will evaluate the management plans of Celtic Sea herring and VIaS, in 2008 the description of the fishery will be updated in greater detail.
(10) Working Group Chairs will set appropriate deadlines for submission of the basic assessment data. Data submitted after the deadline will be considered at a later meeting at the discretion of the WG Chair.	2006	The deadline for catch data submission has been set as 20 <sup>th</sup> February; survey deadline is the week prior to the WG 3 <sup>rd</sup> March.

## 7.6.9 NWWG

Chair : Einar Hjörleifsson

**Generic ToRs**

<b>Term of reference (NWWG)</b>	<b>Year</b>	<b>Comments</b>
(1) based on input from e.g. WGRED and for the North Sea NORSEPP, consider existing knowledge on important environmental drivers for stock productivity and management and if such drivers are considered important for management advice incorporate such knowledge into assessment and prediction, and important impacts of fisheries on the ecosystem;	2006-2008	Continue to predict weight at age of the Icelandic cod based on information of capelin abundance. Focus on environmental drivers will be during the 2007 session.
(2) Evaluate existing management plans to the extent that they have not yet been evaluated. Develop options for management strategies including target reference points if management has not already agreed strategies or target reference points (or HCRs) and where it is considered relevant review limit reference points (and come forward with new ones where none exist) – following the guidelines from SGMAS (2005, 2006), AGLTA (2005) and AMAWGC (2004, 2005, and 2006); If mixed fisheries are considered important consider the consistence of options for target reference points and management strategies. If the WG is not in a position to perform this evaluation then identify the problems involved and suggest and initiate a process to perform the management evaluation;	2006-2008	Priority is high (limit reference points and HCR). Chair will suggest a way to start the process prior to the 2006 meeting, with the aim of completing it for benchmark stocks each year.
(3) where mixed catches are an important feature of the fisheries assess the influence of individual fleet activities on the stocks and the technical interactions;		Will not deal with for stocks in Icelandic waters, not a request from managers. Is important in Faroese waters since the management system is effort based with limited restriction of catch of different species. Analysis currently hampered by unavailability of data. WG in 2006 suggest and initiate a process to obtain the data with the aim of doing an analysis in 2007.
(4) update the description of fisheries exploiting the stocks, including major regulatory changes and their potential effects. Comment on the outcome of existing management measures including technical measures, TACs, effort control and management plans. The description of the fisheries should include an enumeration of the number, capacity and effort of vessels prosecuting the fishery by country;	2006-2007	Description already exist, updates will be provided.

Term of reference (NWWG)	Year	Comments
(5) where misreporting is considered significant provide qualitative and where possible quantitative information, for example from inspection schemes, on its distribution on fisheries and the methods used to obtain the information; document the nature of the information and its influence on the assessment and predictions.		Not considered significant.
(6) provide for each stock and fishery information on discards (its composition and distribution in time and space) and the method used to obtain it. Describe how it has been considered in the assessments;	2006-2008	Will provide where information are available, will not be used in quantitative form since not estimated to be significant and historical information not available.
(7) report as prescribed by the Secretariat on a national basis an overview of the sampling of the basic assessment data for the stocks considered;	2006-2008	Summary tables will be completed by stock coordinators during the WG meetings.
(8) provide specific information on possible deficiencies in the 2006 assessments including, at least, any major inadequacies in the data on landings, effort or discards; any major inadequacies in research vessel surveys data, and any major difficulties in model formulation; including inadequacies in available software. The consequences of these deficiencies for both the assessment of the status of the stocks and the projection should be clarified.	2006-2008	Is addressed annually.
(9) Further develop and implement the roadmap for medium and long term strategy of the group as developed by AMAWGC.	2006	Will have a specific session during the 2006 WG meeting.
(10) Working Group Chairs will set appropriate deadlines for submission of the basic assessment data. Data submitted after the deadline will be considered at a later meeting at the discretion of the WG Chair.	2006-2008	Deadline for basic assessment data are only applicable to shared stocks (Greenland halibut, <i>Sebastes mentella</i> ) where at the present do not have analytical assessment. Deadlines on basic data for these stocks thus set to the 1 <sup>st</sup> day of the WG meeting. Aim set for making update assessment available at the first day of the meeting.

## 7.6.10 WGNPBW

**Planning of Working Group activities 2006-2008****6 April 2006**

Working Group : NPBWWG

Chair : Asta Gudmundsdottir

**Specific ToRs****Assessment methodology, blue whiting and Norwegian Spring Spawning (Atlanto-Scandian) herring**

NEAFC asks ICES to continue ongoing work on this issue.

2005/2/ACFM15      **The Northern Pelagic and Blue Whiting Fisheries Working Group [WGNPBW]:**

- a) assess the status of and provide management options for 2007 for the Norwegian spring-spawning herring stock and the blue whiting stock;
- b) provide as detailed information as possible on the age/size composition in different segments of the blue whiting fishery;
- c) compile existing information on discards and by-catch in the fisheries;
- d) enumerate the number, capacity and effort of vessels prosecuting the fishery by country;
- e) Reconsider the biological reference points in particular for Norwegian spring spawning herring;

for the stocks mentioned in a) perform the tasks described in C.Res. 2005/2/ACFM01.

**Generic ToRs**

Term of reference	Year	Comments
(34)based on input from e.g. WGRED and for the North Sea NORSEPP, consider existing knowledge on important environmental drivers for stock productivity and management and if such drivers are considered important for management advice incorporate such knowledge into assessment and prediction, and important impacts of fisheries on the ecosystem;	2006-2008	Every year there has been a chapter on the environment based on results from the newest survey in the Norwegian Sea. This work will continue to be done every year and is considered important. The results are used when predicting weight at age for the NSSH
(35)Evaluate existing management plans to the extent that they have not yet been evaluated. Develop options for management strategies including target reference points if management has not already agreed strategies or target reference points (or HCRs) and where it is considered relevant review limit reference points (and come forward with new ones where none exist) – following the guidelines from SGMAS (2005, 2006), AGLTA (2005) and AMAWGC (2004, 2005, and 2006); If mixed fisheries are considered important consider the consistence of options for target reference points and management strategies. If the WG is not in a position to perform this evaluation then identify the problems involved and suggest and initiate a process to perform the management evaluation;	2006	It is very important to get the HCR, that the Coastal States made in December 2005 for BW, evaluated. I suggest that Morten Vinther does the evaluation with the SMS program.
(36)where mixed catches are an important feature of the fisheries assess the influence of individual fleet activities on the stocks and the technical interactions;		Not relevant.
(37)update the description of fisheries exploiting the stocks, including major regulatory changes and their potential effects. Comment on the outcome of existing management measures including technical measures, TACs, effort control and management plans. The description of the fisheries should include an enumeration of the number, capacity and effort of vessels prosecuting the fishery by country;	2006	Is done annually. Descriptions of the fishery with the numbers of vessels and so on are delivered together with the catch in numbers so it is no major work.
(38)where misreporting is considered significant provide qualitative and where possible quantitative information, for example from inspection schemes, on its distribution on fisheries and the methods used to obtain the information; document the nature of the information and its influence on the assessment and predictions.	2006	Not considered relevant.



Term of reference	Year	Comments
(39) provide for each stock and fishery information on discards (its composition and distribution in time and space) and the method used to obtain it. Describe how it has been considered in the assessments;	2006	Little informations about discards are available in the WG. This will be discussed during the WG in 2006 and there decided how to start a project in gathering these information.
(40) report as prescribed by the Secretariat on a national basis an overview of the sampling of the basic assessment data for the stocks considered;	2006	Will be done annually, no major job filling out a table.
(41) provide specific information on possible deficiencies in the 2006 assessments including, at least, any major inadequacies in the data on landings, effort or discards; any major inadequacies in research vessel surveys data, and any major difficulties in model formulation; including inadequacies in available software. The consequences of these deficiencies for both the assessment of the status of the stocks and the projection should be clarified.	2006	Most of this will be done annually. However, there is disunity within the group regarding the assessment softwares used. This relates to the NEAFC request and should be solved soon.
(42) Further develop and implement the roadmap for medium and long term strategy of the group as developed by AMAWGC.	2006	This will be discussed during the 2006 meeting.
(43) Working Group Chairs will set appropriate deadlines for submission of the basic assessment data. Data submitted after the deadline will be considered at a later meeting at the discretion of the WG Chair.	2006	This can be done regarding the catchdata and 1 April should be ok. PGNAPES meets in the week before the WG (late August) so it sets the limit of the survey data automatically.

## 7.6.11 WGDEEP

Chair : Paul Marchal (preliminary draft by Phil Large to be finalised by PM in consultation with WG members)

**Specific ToRs**

<b>Term of reference (WGDEEP)</b>	<b>Year</b>	<b>Comments</b>
(1) Compile an inventory of data sources available on landings and effort of deep-water species, including blue ling, ling, and tusk, by ICES Sub-area, Division or preferable by subdivisions; evaluate the quality of these data;	2006	
(2) Compile the data available from these data sources on the finest scale possible.	2007	By correspondence
(3) Update descriptions of deep-water fisheries including mapping out deep-water fisheries in preparation for collation of fisheries-based catch and effort statistics using among other data sources VMS information. Provide information on as high spatial and temporal resolution as possible on all current deep-water fisheries in the NE Atlantic.	2006-2008 2006 2007	Update fishery descriptions (ongoing) Mapping fisheries Providing high resolution data (by correspondence)
(4) Carry out analytical assessments of ling, red (blackspot) seabream, and roundnose grenadier, and assessments of other species if possible.	2006	Experimental VPAs for specified species. CSA/DeLury for blue ling. Assessment plans may change for 2008 (stock reduction models?)
(5) Update the data on length/age at maturity, growth and fecundity and document other relevant biological information on deep-water species	2007	By correspondence
(6) Update information on quantities of discards by gear type for the stocks and fisheries considered by this Group and make an inventory of deep-water fish community data.	2007	By correspondence
(7) Initiate work that will allow the WG to evaluate the effects of the closures introduced in 2005 with special regard to species diversity, and/or changes in the density of commercial fish species or any other living organisms, which may indicate the quality of the ecosystem. Further, prepare for work at the 2007 WG on the appropriateness of the continuation of these, or alternative area closures in 2007.	2006 2007	Initiate Report results and make recommendations (by correspondence).
(8) The Chairs of WGDEC and WGDEEP (Mark Tasker, UK and Paul Marchal, France) will cooperate to ensure ensure that expertise on cold-water corals and on deep-water fishing is available at the meeting	2006-2008	To be achieved in 2006 by presentations by staff common to both WGs (ongoing)

<b>Term of reference (WGDEEP)</b>	<b>Year</b>	<b>Comments</b>
(9) Provide, for each half calendar year, information on effort recorded (in the required format) in either or both logbooks and reports presented by observers (NEAFC request)	2006 to 2008	Ongoing. Require clarification on data requirements for recent years (NEAFC database has not been updated recently?)
(10) Develop sampling plans for deep-sea species (including discards where necessary), and shall communicate them via NEAFC to ICES. ICES shall be asked to review the sampling plans and provide feedback to Contracting Parties via NEAFC (NEAFC request).	2006	Submit sampling plans to NEAFC by Nov (assume NEAFC Convention Area)
(11) Provide, preferably not later than May 2006, information on the spatial and temporal extent of all current deep-water fisheries in the NE Atlantic. ICES is also asked to develop suitable criteria for differentiating fisheries into possible management types (e.g. directed deep-water fisheries, by-catch fisheries etc) and to apply these criteria to categorise individual fisheries. This information is required to enable NEAFC to develop fishery-based management initiatives (NEAFC request).	2006 2007	Spatial and temporal extent of fisheries (see TOR (3)). Develop criteria for typing fisheries Categorise fisheries (by correspondence)
(12) Propose key areas/species to be recorded on a dedicated internationally co-ordinated survey (EC request).	2006	Also provide inventory of existing survey, target species and areas, extent of time series, gear used.
(13) Review and further develop biological reference points for deep-water species (additional TOR ?).	2006	Further guidance from ICES

## 7.6.12 WGEF

Chair : Maurice Clarke

**Generic ToRs**

<b>Term of reference (WGEF)</b>	<b>Year</b>	<b>Comments</b>
(1) based on input from e.g. WGRED and for the North Sea NORSEPP, consider existing knowledge on important environmental drivers for stock productivity and management and if such drivers are considered important for management advice incorporate such knowledge into assessment and prediction, and important impacts of fisheries on the ecosystem;	2007	Low priority. Many of these stocks are long lived. It is less likely that there environmental drivers that for short lived species.
(2) Evaluate existing management plans to the extent that they have not yet been evaluated. Develop options for management strategies including target reference points if management has not already agreed strategies or target reference points (or HCRs) and where it is considered relevant review limit reference points (and come forward with new ones where none exist) – following the guidelines from SGMAS (2005, 2006), AGLTA (2005) and AMAWGC (2004, 2005, and 2006); If mixed fisheries are considered important consider the consistence of options for target reference points and management strategies. If the WG is not in a position to perform this evaluation then identify the problems involved and suggest and initiate a process to perform the management evaluation;		There are no existing management plans for elasmobranchs.
(3) where mixed catches are an important feature of the fisheries assess the influence of individual fleet activities on the stocks and the technical interactions;	2006	We will take a qualitative approach in 2006 to identify the interactions with WGDEEP, WGNSSK, NSWG, SSWG, WGSSTM
(4) update the description of fisheries exploiting the stocks, including major regulatory changes and their potential effects. Comment on the outcome of existing management measures including technical measures, TACs, effort control and management plans. The description of the fisheries should include an enumeration of the number, capacity and effort of vessels prosecuting the fishery by country;	2006 2007 2008	This is a routine task of the group
(5) where misreporting is considered significant provide qualitative and where possible quantitative information, for example from inspection schemes, on its distribution on fisheries and the methods used to obtain the information; document the nature of the information and its influence on the assessment and predictions.	2006	We will start the process this year

<b>Term of reference (WGEF)</b>	<b>Year</b>	<b>Comments</b>
(6) provide for each stock and fishery information on discards (its composition and distribution in time and space) and the method used to obtain it. Describe how it has been considered in the assessments;	2006	This is a routine task
(7) report as prescribed by the Secretariat on a national basis an overview of the sampling of the basic assessment data for the stocks considered;	2006	We will start the process in 2006
(8) provide specific information on possible deficiencies in the 2006 assessments including, at least, any major inadequacies in the data on landings, effort or discards; any major inadequacies in research vessel surveys data, and any major difficulties in model formulation; including inadequacies in available software. The consequences of these deficiencies for both the assessment of the status of the stocks and the projection should be clarified.	2006	We will start the process in 2006
(9) Further develop and implement the roadmap for medium and long term strategy of the group as developed by AMAWGC.	2006	
(10) Working Group Chairs will set appropriate deadlines for submission of the basic assessment data. Data submitted after the deadline will be considered at a later meeting at the discretion of the WG Chair.	2006	We have had this system for some time

## 8 Conclusions and recommendations

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The conclusions and recommendations are included in the executive summary at the beginning of the report.

## 9 References and documents

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Heath, M. R. (2005). "Changes in the structure and function of the North Sea fish foodweb, 1973-2000, and the impacts of fishing and climate." ICES Journal of Marine Science 62: 847-868.

Jonsson, S. T. and E. Hjørleifsson (2000). Stock assessment bias and variation analyzed retrospectively and introducing the PA-residual. ICES C.M. 2000 / X:9.

Pastors, M. A. (2005). Evaluating fisheries management advice for some North Sea stocks: is bias inversely related to stock size? ICES CM 2005 / V:20.

### *Documents*

<b>Document</b>	<b>Title</b>	<b>Agenda point</b>
1	Agenda and timetable	
2	Document list	
3	Annotated ToR AMAWGC 2006	
4	AMAWGC 2006 invited members	
5	Generic ToR's for assessment working groups	3, 5
6	Assessment WG responsibilities 2006	3, 5
7	Review group guidance	-
8 a	Draft contents of ACFM 2006 report	3, 6
8 b	Draft template of Single Stock Summary	3, 6
9	Requests to ICES	5
10 a	WGRED Terms of reference	3
10 b	WGECO Terms of reference	3
10 c	WGFE Terms of reference	3
10 d	REGNS Terms of reference	3
11	SGMAS report (draft)	1
12	WKMIXMAN report (draft)	2
13	Minutes from ACFM Consultations	5
14	Memorandum of understanding between EC and ICES	6
15	Comments by WKNEPH on working procedures	5
16	Paper by Coby Needle on late data	5
17	Outstanding requests for evaluations of management plans	1
18	ACFM recommendations 2005	5

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## Annex 1: Draft 2006 Resolution on Management Strategies

The **Study Group on Management Strategies** [SGMAS] (Chair: Dankert, John??) will meet in xxx from yyy January 2007 to:

- a. review the evaluation of management plans for the following stocks: cod, haddock, saithe, plaice and sole in the North Sea, Northern hake, Southern hake, North East Arctic haddock and blue whiting.
- b. develop methods for the inclusion of ecosystem drivers and possible regime shifts in management plan evaluations
- c. develop methods for the inclusion of mixed fisheries aspects in management plan evaluations
- d. ....

### Supporting Information

Priority:	The work is essential for ICES to progress in the development of its capacity to provide evaluations on management strategies. Such evaluations are necessary to fulfil the requirements stipulated in the MOUs between ICES and Commissions
Scientific justification and relation to Action Plan:	<p>[Action numbers 3.2, 3.4, 3.5, 3.12, 4.2, 4.3, 4.5, 4.11.2, 4.13, 4.15, 7.2]</p> <p>The SGMAS reports of 2005 and 2006 are a first step in establishing guidelines for evaluation of management strategies. The guidelines are considered to be comprehensive and useable. The next step is the application of the guidelines to a number of case studies and the explicit incorporation of ecosystem and mixed fisheries aspects.</p> <p>The field covered by the SGMAS is close to the field of the WGFS. However, the scope of the SGMAS is mainly in developing operational guide-lines to enable ICES to respond to managers' request for advice on development and evaluation of management strategies even at present, while the scope of WGFS is mostly on improving the understanding of how fisheries systems work. Clearly, the SGMAS should draw on the insight provided by the WGFS.</p> <p>The ICES advice format on fisheries has from 2004 included considerations relating to longer term management perspectives. Clients are requesting evaluations of management plans and are receptive to a dialogue on options for management strategies. In order to develop ICES' capability to perform such evaluations and increasingly emphasise longer term considerations in its advice an approach and the necessary analytical tools need to be developed.</p> <p>The SGMAS will further develop the framework for management strategy evaluations which eventually will replace the existing pa framework as the basis for advice and thereby finalise the task of revision of PA reference points which was started in 2003. The framework for management strategies will furthermore be the basis for an exploration of the options for target reference points which will be a component of some management plans in the future.</p>

## Annex 2: Draft 2006 Resolution on Mixed fisheries data

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The collation of mixed fisheries data should ideally be the same as the collation of single species data that is used as input for stock assessments. At present these two data streams are often treated different in the working groups. The InterCatch database (see section 5.4) would be the ideal forum to carry this information.

There is an urgent need to expand the InterCatch database so that it can be used to generate fleet and fisheries based data that can be used to develop displays of mixed fisheries. This can be achieved by allowing direct (read-) access to the InterCatch database on which working groups together with the ICES secretariat can develop scripts to extract and compile the mixed fisheries data. These scripts could then eventually be build into the InterCatch database system.

**AMAWGC recommends: that the mixed fisheries functionality of InterCatch be developed in the short term, preferably in 2006.**

### Annex 3: Draft 2006 Resolution on WKMIXMAN

The **Workshop on Mixed Fisheries Management models** [WKMIXMAN] (Chairs: Stuart Reeves and Sarah Kraak) will meet in xxx from yyy December 2006?? to:

- a. further develop the displays of mixed fisheries data,
- b. to invite appropriate experts (economists, gear technologists) and evaluate the Fcube-method or any other mixed fisheries forecasting method using hindcasting and simulated data.
- c. to evaluate the results of the exploratory applications of Fcube in WGHMM and WGNNSK

#### Supporting Information

Priority:	The work is essential for ICES to progress in the development of its capacity to provide advice on multi-species fisheries. Such advice is necessary to fulfil the requirements stipulated in the MOUs between ICES and Commissions.
Scientific justification and relation to Action Plan:	<p>[Action numbers 3.2, 3.4, 3.5, 3.12, 4.2, 4.3, 4.5, 4.11.2, 4.13, 4.15, 7.2]</p> <p>The WKMIXMAN report is a first step in establishing guidelines for evaluation of fisheries with significant technical interactions.</p> <p>ICES is requested to provide advice which is consistent across stocks for mixed fisheries. Behind this request is the hope that defining consistent TACs at the fishery level would reduce options for discarding and reduce the incentives for illegal landings.</p> <p>The mixed fisheries problem can be formulated as providing tools for displaying interactions between fleets/fisheries in the past and assessing the likely impacts of management measures on the behaviour of fishing fleets (e.g. predicting catch compositions at the fleet/fishery level).</p> <p>Attempts have been made to produce fisheries based forecasts based on effort policies and the MTAC model was developed for this purpose (SGDFF 2003 and 2004, STECF 2003). However, it has been realised that fleet based predictions in the traditional quantitative sense are impractical as an advisory input to management (STECF 2004 and ACFM 2004).</p> <p>Reasons are various including</p> <ul style="list-style-type: none"> <li>• catch composition is variable and it is not clear which aggregation level is required to achieve the needed predictability (haul, metier, fisheries, fleet);</li> <li>• data required to run such models, notably discards data, do not exist on the resolution required;</li> <li>• fishing strategy (e.g. choice of gear, fishing season and fishing ground) adapts to management and the flexibility in determining the catch composition available to the fishing fleets is not well understood;</li> </ul> <p>New approaches are needed which focus on developing an understanding</p>

	<p>of fleet behaviour and the implications for management strategies for mixed fisheries.</p> <p>The external experts are expected to contribute to a broad interdisciplinary forum that can review the results of different disciplines.</p>
Resource requirements	
Participants:	Experts with qualifications regarding mixed fisheries aspects, fisheries management and modelling based on limited and uncertain data.
Secretariat Facilities:	Meeting facilities, production of report.
Financial:	
Linkages to advisory committees:	ACFM
Linkages to other committees or groups:	RMC through the WGMG
Linkages to other organisations:	This work serves as a mechanism in fulfilment of the MOU with EC and fisheries commissions.
Secretariat Cost Share	ICES: 100%

## Annex 4: Overview of management plans not yet evaluated

The existing management of the following stocks have not yet been evaluated by ICES:

- Blue whiting
- NEA haddock
- North Sea cod
- North Sea haddock
- North Sea saithe
- Cod west of Scotland
- Cod in Irish Sea
- Northern hake
- Southern hake

The following plans have not been evaluated but there is no clear requests from clients to evaluate the plans:

- Icelandic cod in Va
- Capelin in the Iceland-East Greenland-Jan Mayen area (Subareas V and XIV and Division IIa west of 5°W)

## Annex 5: Overview of requests for 2006

**List of special requests for 2006 – status as of February 2006**

**Full list of all requests (incl MoUs) can be viewed at:  
<http://www.ices.dk/advice/request/requesttable.asp>**

CUSTOMER	REQUEST – Special	DATE	RESPONSE
EC			
DG Fish	<p>Compile status list of EU Fish stocks</p> <p>Use of pulse-trawl electrical gear to target plaice and sole in beam-trawl fisheries</p>	<p>January 2006</p> <p>24 November 2005</p>	<p>February 2006</p> <p>ACFM Late spring 2006</p>
NEAFC	<p>Regarding redfish stocks in the Irminger Sea and adjacent areas:</p> <p>a. Continue to provide information of stock identity of <i>Sebastes mentella</i></p> <p>b. provide quantitative information to allow spatial and temporal limitations in catches and other measures</p> <p>c. provide clear definitions of terms with respect to <i>Sebastes mentella</i></p> <p>Regarding vulnerable deep-water habitats in the NEAFC Regulatory Area:</p> <p>a. on distribution of vulnerable habitats in the NEAFC Convention Area and fisheries activities in and in the vicinity of such habitats;</p> <p>b. assisting NEAFC in evaluating the closures of the Faraday, Hekate, Antialtair, Altair seamounts and the area on the Southern Reykjanes Ridge not later than November 2007</p> <p>Regarding deep sea species: provide, preferably not later than May 2006, information on the spatial and temporal extent of all current deep-water fisheries in the NE Atlantic. ICES is also asked to develop suitable criteria for differentiating fisheries into possible management types (e.g. directed deep-water fisheries, by-catch fisheries etc) and to apply these criteria to categorise individual fisheries.</p>	<p>November 2005</p> <p>November 2005</p> <p>November 2005</p>	<p>ACFM 15 Oct 2006</p> <p>ACFM 15 Oct 2006</p> <p>ACFM May 2006</p>

	<p>Regarding Rockall haddock: The NEAFC Commission requests ICES to provide information on the effect of the Rockall box in protecting juvenile haddock and possible revisions of the boundary of the box.</p> <p>Regarding pelagic sharks: propose a sampling scheme and a list of information that should be obtained from the fisheries on pelagic sharks to allow ICES to improve the quality of assessment and advice</p>	<p>November 2005</p> <p>November 2005</p>	<p>ACFM 15 Oct 2006</p> <p>ACFM 15 Oct 2006</p>
<b>OSPAR</b>	<p>The design of one-off surveys to provide new information for a number of OSPAR Chemicals for Priority Action</p> <p>Guidelines on frequency and spatial coverage of monitoring for nutrients and eutrophication parameters</p> <p>Review of draft guidelines on frequency and spatial coverage of monitoring EcoQO for changes in zoobenthos in relation to long-term eutrophication Further development of the EcoQO on plastic particles in stomachs of seabirds</p> <p>Quality assurance of biological measurements in the North East Atlantic</p> <p>Use of food safety monitoring programmes for monitoring dioxins and furans in fish and shellfish</p> <p>EcoQ element for fish communities</p>	<p>July 2004</p> <p>July 2004 – OSPAR to come back with more information in February 2006</p> <p>July 2005</p> <p>July 2005</p> <p>July 2005</p> <p>July 2005</p> <p>July 2005</p> <p>July 2005</p>	<p>1 April 2006</p> <p>ACME June 2006</p> <p>ACME mail 6-11 April</p> <p>ACE June 2006</p> <p>ACME mail 6-11 April</p> <p>ACME mail 10-20 March</p> <p>ACME mail 6-11 April</p> <p>ACE June 2006</p>
<b>HELCOM</b>	<p>To coordinate quality assurance activities on biological and chemical measurements in the Baltic marine area and report routinely on planned and ongoing ICES inter-comparison exercises, and to provide a full report on the results</p>	<p>June 2005</p>	<p>ACME and ACE June 2006</p>



<b>MEMBER STATES</b>			
Norway	Management goals for seal stocks	16.06.05	Hooded seal response: ACFM June 2006

## Annex 6: Background document on a new WGNSSK timetable

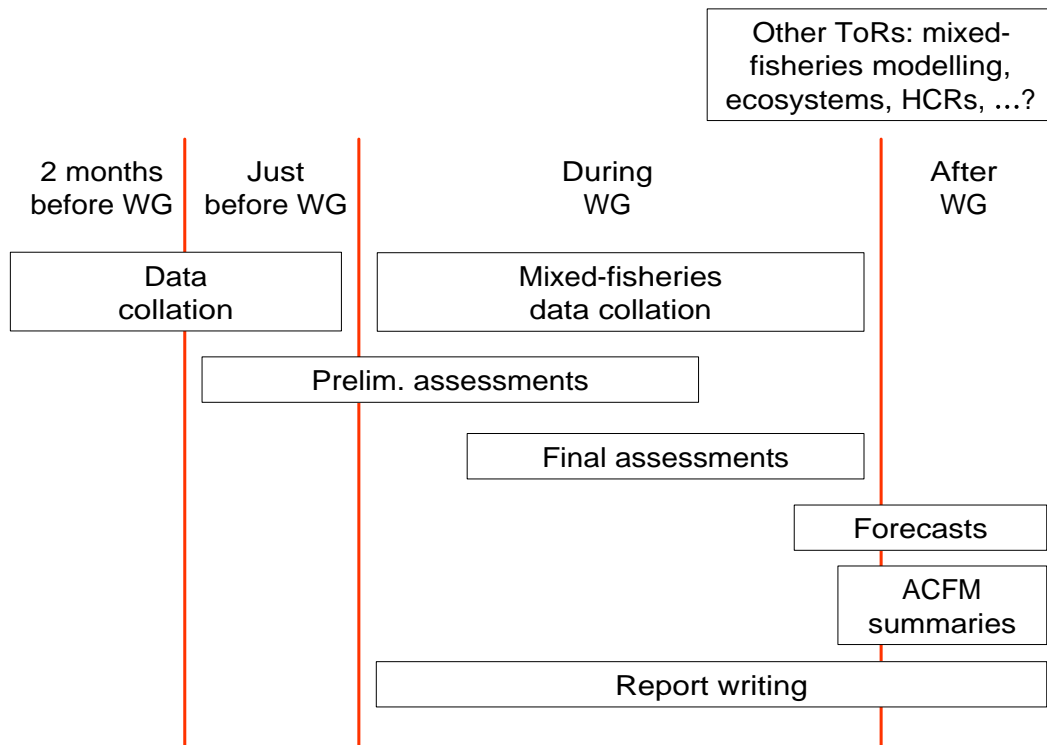
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Coby Needle (chair of WGNSSK)

The assessment WGs in general, and (for 2006) WGNSSK in particular, have been asked to prioritise the generic ToRs that are listed in Section 7.3. There are several key issues within these ToRs for which a rapid response from WGNSSK is imperative – these include harvest-control rule evaluation, tests of mixed-fisheries modelling approaches and improved liaison with survey WGs. However, time in the WG is limited, and these additional tasks will only be addressed if traditional assessment work is curtailed.

Much of the time spent on assessments is taken up by *fiddling* – that is, making minor modifications to model settings and parameters with aim of improving model fit and usefulness. This leads to a contradiction. The diagnostics available in stock assessment models are seldom sufficient to determine which of many different possible combinations of settings leads to the “best” model, and the resultant changes are often not detectable within bounds of uncertainty. However, small changes in the outcomes of assessments can make big differences to stakeholders (fisheries managers, the fishing industry, and others). Thus, while fiddling may seem futile and always uses up time that could be spent on other things, it is also very difficult to avoid when assessments are under close scrutiny. The question is: How can WGs avoid fiddling, while still meeting the needs of stakeholders?

One potential solution would involve two major changes to assessment WGs: the use of *probabilistic assessments and forecasts*, and *restructuring the WG timetable*. Figure A6.1 shows the current timetable followed by WGNSSK. Data collation continues right up until (and in some cases beyond) the start of the meeting, limiting the extent of preliminary analyses which are consequently delayed (in many cases) until the week before the meeting begins. These preliminary analyses sometimes extend into the second week of the meeting. Final assessments may not be finished until the very end of the meeting. This leaves very little time for forecasting and drafting of ACFM summary sheets, and it is these two aspects that are the key assessment-based outputs of the WG. Mixed-fisheries data are collated during the meeting itself. The report is not begun until the meeting begins, and drafting and editing may continue for weeks after the meeting ends. Finally, there is little opportunity for the WG to address the additional generic ToRs and these are often left aside.



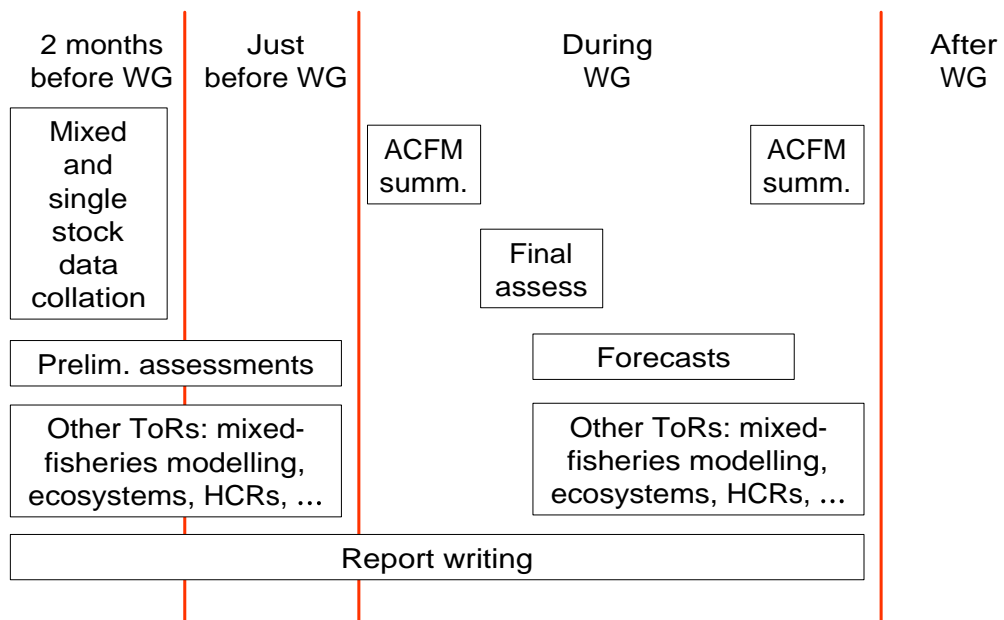
**Figure A6.1.** The current timetable used by WGNSK.

An alternative scheme for WGNSK might look like that given in Figure A6.2. The principal features of this, with justifications and prerequisites, are as follows:

1. The imposition of a cut-off point for data submission would mean that all data could now be collated well in advance of the meeting. As data for mixed-fisheries analyses and single-stock assessments are the same, they would be collated at the same time.
2. Preliminary assessments should be finished before the meeting begins. The additional ToRs means that the focus of the meeting should shift towards analyses other than traditional stock assessments, which therefore need to be completed beforehand. The task of the WG in this regard is to briefly review the preliminary assessments before deciding on final assessments during the first week of the meeting. Many deterministic assessments are extremely sensitive to small changes in input data or model settings, making it very difficult to decide on final configurations. *Probabilistic assessments* would allow for this uncertainty, and could lead to a situation in which there is no assessment decision to make: rather, the outcome of the assessment would be distributions of abundance, mortality, etc. The semi-automatic nature of probabilistic assessments would also mean that late-arriving survey data could be incorporated much more rapidly than is the case currently. An alternative approach would be to insist on strict adherence to the spirit of update assessments, but this relies on a) the existence of accepted assessments to update, and b) a better understanding in fisheries managers that deterministic update assessments will fluctuate from year to year.
3. Report writing would begin during the preliminary assessment phase, and continue until the end of the meeting. There is no reason why writing should only begin towards the end of the first week of the meeting, as is often the case now.
4. The earlier conclusion of assessment work would leave more space for forecasts, whether probabilistic or not. It would also allow for due consideration of the additional ToRs, specifically (for WGNSK) evaluation of harvest control rules, tests of mixed-fisheries models, and better use of survey data and ecosystem information. Ideally much of this would also be done intersessionally, and continued by WG

participants who would concentrate on these aspects during the meeting (and not do assessments).

5. Last, but not least, the importance of the ACFM summary sheets to the advisory process would be emphasised by having the WG consider them twice during the meeting. Firstly, the sheets from last year would be reviewed at the start of the meeting, to ensure that the key issues for each stock are highlighted and to prevent time being wasted on unimportant details. Secondly, the sheets would be reconsidered at the end of the meeting, and suggestions for redrafting collated. The WG should not write advisory text, but should outline on the sheets (in different coloured text, if need be) the steps taken in reaching each assessment decision.



**Figure A6.2.** A proposed new timetable for WGNSSK.

As with any proposal for a new approach, there are of course several potential problems to be overcome. The methodology of probabilistic assessments and forecasts is quite embryonic, at least in the ICES context, and work is still needed in development and testing of methods that could allow for the qualitative approach indicated above. Any such approach would provide managers with evaluations of *risk*, rather than forecasts of catch – so that the conclusion might read as “landings of 20,000 tonnes will lead to a 20% risk of falling below  $B_{lim}$ ”, rather than “fishing at  $F = 0.36$  will result in landings of 20,000 tonnes and  $B = 123,500$  tonnes.” It is not yet clear who managers would deal with advice of this kind in their decisions. Finally, the pressure to address additional ToRs will inevitably force much of the assessment work to be done before the meeting, with a concomitant expectation of intersessional work. Not all participating laboratories and institutes have the capacity to meet such an expectation. These are not insurmountable difficulties, but need to be considered carefully before a functional change in assessment WGs can be made.

## Annex 7: AMAWGC terms of reference 2007

The **Annual Meeting of Assessment Working Groups Chairs** [AMAWGC] (Chair: Martin Pastoors\*, The Netherlands) will meet back-to-back with WGRED at ICES Headquarters from 29 January 14:00 to 2 February 13:00 2007 and in the margin of the ASC 2007 to:

- a) review the Table of Contents for the ICES Advisory Report for 2007 and for each Chapter identify what the Groups that shall contribute;
- b) review and plan further implementation of long-term management simulations and evaluations of recovery plans and harvest control rules as presented by e.g. the Study Group on Management strategies (SGMAS);
- c) further inclusion of the work of the Working Group on Regional Ecosystem Description (WGRED) in the ICES advisory process regarding fisheries
- d) plan further implementation of fisheries-based advice by the Assessment Working Groups and integration of fisheries technology expertise, using the results of WKMIXMAN;
- e) review developments in stock assessment methodology in relation to the implementation in the Assessment Working Groups;
- f) Review the road map of where the individual WGs should be moving in the medium and long term. This should include issues like assessment methods, surveys, basic scientific work, data collection, proactive development of management strategy options, mixed fisheries issues, ecosystem impacts and impacts on ecosystem analysis.

AMAWGC will report by 2 March 2007 for the attention of ACFM.

### Supporting Information

Priority:	The Meeting is instrumental in the process to allow for the assessment working group chairs becoming able to produce with their assessment wg the input required for the new management strategy evaluations in the advice and for incorporating existing knowledge about ecosystem linkages and about mixed fisheries in the assessment.
Scientific justification and relation to Action Plan:	<p>[Action numbers 3.2, 4.13, 4.15]</p> <p>The ICES advice on fisheries will in the future emphasise longer term management issues. It will address the practical situation of fisheries management better by being both stock and fisheries-oriented and it will increasingly include ecosystem considerations. These changes are introduced as a response to changes in the policy and management environment including both recent international agreements and resolutions such as the WSSD 2002 declaration and requirements from clients as expressed in the MOU between ICES and the European Commission.</p> <p>In order to introduce these changes there is a requirement to develop or operationalise the necessary approaches and methodologies and to enable the working groups to implement these approaches in order for ACFM to have the relevant input for the advice as required to address new aspects of the advice. Inputs to the fisheries assessments workings which will</p>

	enable the groups to take onboard new information and approaches to ecosystem related issues and management strategy evaluations are produced by the SGMAS and WGRED. The AMAWGC group will serve as the interface between this work and the working groups and the group of chairs will have a forum to discuss and decide on the implementation in the course of WG meetings in 2005.
Resource requirements	
Participants:	Invited chairs: Under ACFM: WGMHSA, HAWG, NWWG, WGBFAS, AFWG, WGNPBW, WGNSDS, WGSSDS, WGNSSK, WGNAS, WGDEEP, WGNEW, WGHMM, WGEF, WGEEL, WKMIXMAN; WGFTB; chair ACE, chair ACME.  Survey planning group chairs  WGECO, WGFE
Secretariat Facilities:	
Financial:	
Linkages to advisory committees:	ACFM

Linkages to other committees or groups:	RMC through the WGMG
Linkages to other organisations:	This work serves as a mechanisms in fulfilment of the MOU with EC and fisheries commissions
Secretariat Cost Share	ICES: 100%