

ICES WKROUNDMP REPORT 2011

ICES ADVISORY COMMITTEE

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Report of the Joint ICES–STECF Workshop on management plan evaluations for roundfish stocks (WKROUNDMP/EWG 11–01)

28 February – 4 March 2011

ICES Headquarters, Copenhagen



ICES

International Council for
the Exploration of the Sea

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Executive Summary

A joint ICES / STECF meeting met 28 February to 4 March in Copenhagen, for preparation of Impact Assessments for Bay of Biscay sole and Baltic Cod, and historic Evaluations of existing plans for Kattegat, North Sea, West of Scotland and Irish Sea cod. The meeting involves STECF, ICES scientists dealing with Economy and Biology and Observers (Commission staff, Managers, Stakeholders). The workshop has fully addressed its Terms of Reference, and progress has been made in all areas.

The Impact Assessment of Bay of Biscay was fully completed, the biological aspects were relatively straightforward, with a clearly defined single species MSY target for exploitation of this stock. It is anticipated that exploitation at MSY will give biomass that is significantly above any precautionary reference points and thus maximising exploitation forms the main criteria. The economic evaluations were if a very high standard, probably the best done so far under STECF.

The work required for the impact assessment of Baltic cod was identified and is documented in the report. In most cases the work is clear, although some minor details in parameterisation remain to be finalised. There was considerable discussion of single species / multi-species targets for Baltic cod. The issues raised are multi-species in the context of population interactions affecting yields, not multi-species in a mixed fisheries context of reconciling different catch rate targets in a mixed fishery. For Baltic cod plans this aspect has not been resolved, as currently no work detailing assumptions and results has been presented within the group.

Currently STECF and ICES develop MSY targets based in single species evaluations. It is clear that multi-species aspects can be parameterised more easily in the Baltic (and Barents Sea) than in other areas where the species complexity is greater. Currently it is unclear how STECF or ICES should base advice. While we hope to resolve some of these issues others may not be resolvable within the scope of this study. For the group to understand the issues and give sound advice it is important that those responsible for the analyses provide a good description of their assumptions and the sensitivity of the results to model assumptions and choice of parameters.

In this context the basis of studies and the results need to be circulated in advance of the meeting.

A brief outline of the requirements to deliver the answers to questions on NS whiting is provided. The work will be carried out prior to WGNSSK in May and draft advice will be passed to ADGNS from WKNSSK. If WKNSSK is satisfied with the work it will be passed directly to ADGNS and subsequently ACOM. If substantive revision is required and further review needed this will be done at the next meeting of WKROUND2011 20-24 June 2011.

1 Opening of the meeting

1.1 Terms of Reference

The TORs are a combination of requests to STECF and ICES

Hold a meeting 28 February to 4 March in Copenhagen, for scoping and preparation of Impact Assessments for new management plans, and historic Evaluations of existing plans. The meeting should involve Observers (Commission staff, Managers, Stakeholders) and Scientists dealing with Economy and Biology and should prepare for work on the following stocks:

a) Impact Assessments for new plans for

- Bay of Biscay sole

b) Scoping for Impact Assessments for new plans

- Eastern and Western Baltic Cod

c) Scoping for historic Evaluations of existing plans

- North Sea cod,
- Kattegat cod
- West of Scotland cod
- Irish Sea cod

d) Clarification of ICES advice on NS whiting

For the Scoping the meeting should to determine the workload required and to reconcile this with available resources, to arrive at an effective detailed plan of what is needed to carry out the technical work that will underpin the required Impact Assessments and Evaluations. For North Sea cod the review should take account of any specific request from Norway (either relayed by the European Commission or submitted to ICES), and STECF guidelines. For the Baltic cod the meeting should concentrate on Impact Assessment for Western Baltic Cod, only amending the Eastern Baltic Cod plan if it is thought to need amendment in context of combined management with the Western Stock. Separate reports will be prepared the Impact Assessment on Bay of Biscay sole and scoping for all other cod plans. Reports should taking into account of the generic ToR from STECF report SG-MOS 10-01 and annex from SG – MOS 09-02.(See docs below)

For the Evaluation of NS cod plan the meeting should consider the reporting requirements of STECF and ICES and the information required by Commission and Norway (see below) and propose the best approach to provide the reporting requirement for all concerned. As a deliberate policy, in addition of scientists to be invited by the STECF to join this meeting as external experts, this EWG 11-01 will be open to scientists appointed or nominated by ICES.

The meeting should also examine work requirements and the appropriate expert group to answer the request to ICES from Norway (see below) concerning clarifica-

tion of ICES advice on exceptions to 0.3 as the target fishing mortality rate for whiting in subarea IV (North Sea) and division VIIId (Eastern Channel) specifically: the level and number of years for which recruitment is considered poor to trigger action; the lower level to which fishing mortality should be reduced when required; and the rate of reduction to the lower level in the event of poor recruitment.

1.2 Participants

The full list of participants at WKROUNDMP2011/EWG-11-01 is provided as Annex 1.

1.3 Purpose of the meeting

The objective of this meeting is to determine the workload required and to reconcile this with available resources, to arrive at an effective detailed plan of what is needed to carry out the technical work that will underpin the required Impact Assessment or Evaluation.

The scoping group must ensure that

- The objectives of management are clear
- Idea of resources that should be committed are appropriate for the work
- Clear options and scenarios are selected

1.3.1 Impact Assessments

Define Starting point for options and scenarios for Impact assessments

- a) To define the starting situation: the starting situation is the social and economic situation observed at the end of the evaluation period, it should be defined during the evaluation process.
If not, define the economic and social starting situation for the fishing fleets, onshore industries and communities that depend on the fishery concerned and of associated fisheries (e.g. size, turnover, costs, profits, employment for last three years) for each Member State and fishery affected.
- b) State of the stock(s) at the beginning of the period.
- c) Define the 'no change' management regime that would be followed such that biological, economic and social consequences can be estimated over the impact assessment period.

Select a number of tactical options to be evaluated.

Select a number of plausible biological and economic scenarios against which the tactical options are tested in order to characterise the robustness of the different tactical options to external factors.

Identify basic methodology to be used.

Decide on the models to be used and define how they are to be parameterized, with stock dynamics, estimation and implementation components. Simulation methodology and criteria for stock modelling should follow ICES – SGMAS 2008 section 5. Integrated economic and biological models are an important tool for impact assessments and the scoping meeting should consider the availability and requirements for integrated modelling. (see also SGMOS 10-03 WG to be held in Rennes dealing with the ecosystem approach to fisheries management)

Define the criteria (indicators and performance measures) to be retained and presented for all scenarios and options to allow comparison of scenarios and options. It is important to identify which indicators are appropriate for the specific cases being assessed as it is unlikely that all of these will be available or appropriate in all cases. Once economic criteria for evaluation are selected, the appropriate methodology and data should be specified.

Check that biological reference points are compatible with Stock/Recruit dynamics and reconcile if necessary.

Identify specific data that required and timescale for acquisition including any data call required.

- a) Data shall primarily be sourced from the Data Collection Framework from databases in JRC, although additional information should be sourced where necessary.

Define how the simulation work will be checked/verified.

Identify who will do what on what timescale and under what conditions and define how the chair will monitor progress between the meetings

Agree work timetable and dates for Impact Assessment meeting.

1.3.2 Historic Evaluations

Review the plans and determine what aspects of the management need to be reviewed. Consider how changes in the fishery, the stock and the ecosystem will be considered.

Identify sources of data on stock and fishery (e.g. ICES assessments and STECF effort database)

Define methods to be used, quantitative or qualitative

For simulations to assess probability of future outcomes such as MSY in 2015.

- To define the starting situation: If only biological aspects are to be tested forward agree which assessment or state of the stock define the beginning of the period.
- If economic aspects are to be projected forward define the economic and social starting situation for the fishing fleets, onshore industries and communities that depend on the fishery concerned and of associated fisheries (e.g. size, turnover, costs, profits, employment for last three years) for each Member State and fishery affected.
- Define how success or difficulties in implementation will be investigated and allocated amongst different players, scientific advice, management decisions, and implementation.

To evaluate the performance without the plan

- Define the 'no change' management regime that would be followed such that biological, economic and social consequences can be estimated over the impact assessment period.
- Select the types of tactical options (TAC, Effort, Closed areas) to be evaluated.
- Identify basic methodology to be used.

Define the criteria (indicators and performance measures) to be retained and presented for all scenarios and options Check that biological reference points are compatible with Stock/Recruit dynamics and reconcile if necessary.

Identify and specific data that required and timescale for acquisition.

Data shall primarily be sourced from the Data Collection Framework from databases in JRC, although additional information should be sourced where necessary.

Identify who will do what on what timescale and under what conditions and define how the chair will monitor progress between the meetings

Agree work timetable and dates for Evaluation meeting.

1.4 Agenda

The agenda is given in Annex 2

1.5 Structure of work and report

The work is structured in four discreet tasks, (ToR, a to d). The first ToR, the Impact Assessment for Bay of Biscay sole forms a discrete report which is required by a single client, (STECF/ Commission) following the normal procedures for individual reports this has been prepared separately following STECF format and is to be available on the STECF web site with a link on the ICES site.

The other ToR dealing with the scoping for further tasks are all contained in this report, structured by ToR with Section 4 addressing STECF ToR for the Impact Assessment for Baltic cod, Section 5 both ICES and STECF ToR for the evaluation of the four cod plans and section 6 the clarification of advice for whiting.

2 Conclusions of the Working Group

The working group has fully addressed its Terms of Reference, and progress has been made in all areas.

2.1 Tor 1 Bay of Biscay:

The Impact Assessment of Bay of Biscay was fully completed, the biological aspects were relatively straightforward, with a clearly defined single species MSY target for exploitation of this stock. It is anticipated that exploitation at MSY will give biomass that is significantly above any precautionary reference points and thus maximising exploitation forms the main criteria. The economic evaluations were if a very high standard, probably the best done so far under STECF. The Impact assessment is documented in separate report (EQG 11-01a

<https://stecf.jrc.ec.europa.eu/reports/management-plans>).

2.2 ToR 2 Baltic Cod

The work required for the impact assessment of Baltic cod was identified and is documented in Section 4 below. In most cases the work is clear, although some minor details in parameterisation remain to be finalised. There was considerable discussion of single species / multi-species targets for Baltic cod. The issues raised are multi-species in the context of population interactions affecting yields, not multi-species in a mixed fisheries context of reconciling different catch rate targets in a mixed fishery.

For Baltic cod plans this aspect has not been resolved, as currently no work detailing assumptions and results has been presented within the group.

Currently STECF and ICES develop MSY targets based in single species evaluations. It is clear that multi-species aspects can be parameterised more easily in the Baltic (and Barents Sea) than in other areas where the species complexity is greater. Currently it is unclear how STECF or ICES should base advice. There are a number of issues.

- Are multi-species target Fs significantly different from single species values? How much do both depend on the particular model assumptions?
- What level of variability might be expected from the system in the medium term due to multispecies assumptions and will a cod plan based on single species concepts be robust to these changes?
- Are long term fixed multi-species target Fs an appropriate way of maximising yield in a multi-species context or would medium term targets in that depend on the observed multi species state be more appropriate.
- Can multi-species targets be defined on a biological basis or do they require trade-off options that are the responsibility of managers, requiring a multi-species plan more complex than the cod plan currently envisaged

To illustrate some of the issues simulations are required (see below) that illustrate the following

- Development of SSB-levels according to fishery at different F-target-levels.
- Address the situation where recent fishing mortality levels for a longer period have been well above single stock MSY target F as is the case for Western Baltic cod.

While we hope to resolve some of these issues others may not be resolvable within the scope of this study. For the group to understand the issues and give sound advice it is important that those responsible for the analyses provide a good description of their assumptions and the sensitivity of the results to model assumptions and choice of parameters.

In this context the basis of studies and the results need to be circulated in advance of the meeting.

2.3 ToR 3 Four cod plans

The work required to Evaluate to cod plans for Kattegat, North Sea, West of Scotland and Irish Sea has been substantively identified and individuals allocated to different aspects (Section 5). Data from the data calls for annual Economic data and Effort data are critical to some aspects of the work. Member States are specifically encouraged to try to ensure high quality data is submitted under these calls specifically for cod fisheries. Delays due to resubmission will have a negative impact on our ability to generate results.

The approach to evaluating the added value of the current plan is currently still under discussion. Such an analysis depends on a number of steps. Identifying what would have been the management response without a plan, would the management response have set sufficiently different TACs from those set under the plan, if the TACs were different would they have changed the response of fishermen. If we can

resolve these issues an economic baseline response will be discussed. This should be discussed and decided at STECF plenary in April.

2.4 ToR 4 Clarification of ICES NS whiting advice

Section 7 provides a brief outline of the requirements to deliver the answers to questions on NS whiting. The work will be carried out prior to WGNSSK in May and draft advice will be passed to ADGNS from WKNSSK. If WKNSSK is satisfied with the work it will be passed directly to ADGNS and subsequently ACOM. If substantive revision is required and further review needed this will be done at the next meeting of WKROUIND2011 20-24 June 2011.

3 Recommendations of the working group

There are no additional recommendations from this group at this stage as the whole purpose of the meeting is to layout and recommend work.

4 Baltic Cod

4.1 Introduction

The sections below indicate the questions to be answered taken from Annex B SGMOS-10-01: FRAMEWORK FOR Impact assessment (in Italics) and the work proposed in plain text

4.2 Problem statement

The Commission should provide scope and limits of problem to be addressed

Why there is a need to react and where appropriate link this to background studies or information. Objectives are defined in general terms as the CFP, these are linked to specific objectives such as Fmsy and finally the Impact assessment provides options for operational aspects such as target values of F or overall exploitation strategies for MSY exploitation.

(Commission should supply text John Simmonds to request)

Specific objectives: The specific objectives in relation to Baltic cod are given in terms of changes and expectations of outcomes with timescales (for example achieving exploitation target in X years).

Biological objectives:

Considerations in relation to management:

Consider operational management objectives given different Stock-Recruitment relationships and environmental conditions for the Baltic cod stocks considering different regimes and recent levels of recruitment.

Methods to address the considerations (Coordinator: Joakim Hjelm, IMR-S; John Simmonds, JRC; Rasmus Nielsen, DTU Aqua):

- Analyse candidates for single stock MSY targets for fishing mortality given different stock-recruitment-relationships and time series for recruitment (standard YPR and Fmax analyses; Bayesian Model Selection);
- Discuss single species management objectives in relation to multi-species management objectives;

- Discuss the management objectives in context of historical F values have been well above single stock MSY targets for the Western Baltic cod as evaluated by SGMOS-10-06b and in context of scenarios for development in SSB-levels given the situation of fishing at F(MSY) targets;
- Recommend candidates for operational biological management targets;

Data needed to address the above:

- Input and output data from ICES WGBFAS April 2011
- Output from SGMOS-10-06b analyses and simulations
- Periods (regimes) for S-R-relationships to be considered
- Periods for different recruitment regimes
- Proposals for candidate S-R-relationships

Single stock biological objectives will presented and considered along with of multi-species biological objectives for the Baltic cod stocks (see objectives in Section 4.7).

GES Objective (Good Environmental Status) by 2020: No specific objectives set for the two Baltic cod stocks. See also the section on ecosystem approach to sustainable fisheries below in relation to overall objectives.

Economic and Social objectives

No specific economic and social objectives are set in relation to the Baltic cod fisheries.

4.3 Identifying tactical methods

Management considerations addressed:

1. *How can the plan be amended to become more effective (i.e. higher chance of reaching the goal – where necessary)?*
 - effectiveness of TAC constraints at controlling catch and the effect of discards and the impact of a discard ban
 - effectiveness of effort regulation for reducing F
 - bio-economic evaluation and cost effectiveness of effort and TAC regulation
 - effectiveness of area closures to improve recruitment or protect the stocks
 - influence of biological (population dynamic) variability impacting effect of management
 - possibilities to include removals currently not considered (recreational fishery).
2. *How can the acceptance of the plan be improved and at the same time some of the management approaches outlined in the CFP reform be implemented?*
 - what can management offer the fishery to buy into the new plan?
 - alternative management approaches?

Several aspects will be reviewed and discussed in order to evaluate which control measures (e.g. TAC, effort, closed areas and gear regulations) contribute to controlling fishing mortality and are considered necessary.

4.3.1 Evaluation of Effort restrictions in relation in relation to objectives:

Consider requirements for fishing effort limitations for Eastern and Western Baltic cod management. Consider if the effort regime does or does not make a positive or negative impact on management. Consider to what extent the effort restrictions will help in achieving the LTMP for the Western Baltic cod? Can management be made simpler?

To answer these two questions and considerations it is first necessary to identify the actual problems in relation to management: For example, is the problems in management the variable recruitment in relation to variable environment, unaccounted removals (not yet included in assessment or TAC), or is it control-enforcement aspects. Given the problem to be addressed the following should be considered:

- Has the management plan been efficient in relation to the intentions, e.g. is there efficient F reduction when F is translated into E reduction when exploitation is above F-targets?
- Is TAC regulation with or without certain constraints (e.g. +/-15%) adequate for a range of plausible recruitment options – especially for E. Balt. Cod? Is TAC regulation for the E. Balt. Cod adequate given adequate control and enforcement? Can adequate information (estimation) of and measures for catch be obtained in order to make TAC regulations alone be workable? Consider in relation to this if effort regulation is a useful enforcement tool if accuracy of reporting was to decline. Take into account that TACs currently 'control' landings not catches.
- If using an effort regulation system, what would a better design of this be given main problems herein (respectively for E. and W. Balt cod)?
- Are days absent from harbour an adequate effort measure (for different fleet types)? Consider among other here passive gears and fisheries with relative long steaming time.
- What baseline effort levels are needed, i.e. are present effort levels adequate? How was the original baseline calculated?

Methods and approaches to address the above questions and considerations:

- Listing needs, pros, cons, and problems in enforcement and control for effort regulation and TAC regulation (see also 4.3.4 below) (certain issues by fleet / country) and discuss risks of non-compliance? (Coordinator: Jesper L. Andersen, FOI)
- Document effort and capacity ceilings by country (Coordinator: Rasmus Nielsen, DTU Aqua).
- Document to what extent effort quotas and TAC quotas (in the management plan and previously) have been restrictive or not by fishery/metier/fleet and country through information from national administrations. Document actual quotas and quota up-take both for effort and TAC. List effort restrictions in relation to utilized capacity by country and fishery. (Coordinator: Rasmus Nielsen, DTU Aqua)
- Describe recent developments in compliance in relation to TAC and effort restrictions in the E. Baltic Sea and the W. Baltic Sea compared to historical information on this. (Coordinator: Christoph Radtke, MIR)
- Discuss capacity utilization by country and fleet/metier in relation to actual historical development and in relation to different types of management (Katharina Jantzen, vTI-SF).

- In relation to used effort measures and baseline effort settings evaluate relationship between F and E overall by management area and cod stock – and possibly by segment in relation to potential fishing power differences (Coordinator: Rasmus Nielsen, DTU Aqua)
- Simulation results from stock-based evaluation of likelihood of reaching targets of the LTMP (using up-date information and simulations from EU STECF SGMOS 10-06b and the simulation model used here) for respectively using only TAC measures, only using effort measures, and for using a combination of both under different relevant scenarios of recruitment, effort and TAC restrictions, and scenarios for relative annual variability constraints. Where discards are included in the assessment discard (data sets) are to be simulated in the HCR evaluations where yield is taken as landing component of catch. (Coordinator: Rasmus Nielsen, DTU Aqua). Initial suggestions for year ranges for parameterization, actual assessment parameters to be used, as well as errors to be evaluated are listed below. This list of settings and parameters is a preliminary list of intended input for evaluations and might be added to according to the running output and results from simulations.
- Check whether Effort and TAC allocations do not diverge in a problematic way if the rates are constrained in different ways (Coordinator: Rasmus Nielsen, DTU Aqua)
- General discussion and possible implications

Eastern Baltic cod (SD 25-32):

- 1) Year ranges for R and SSB defined by year classes
 - Entire assessment time series (1966-2008)
 - 1988-2009 (after the regime shift, starting year in line with long term simulations of MP; Bastardie *et al.* 2010)
 - 1966-1987 (before the regime shift)
 - Recent 1994 to present (if necessary by rescaling mean) based on ecosystem study showing transition finishes in 1993
- 2) Year ranges to parameterize weight at age
 - 1981-2009/2010 (for earlier years constant values are used in assessment)
 - 2005-2009/2010 (as weight as continuously declined in recent decade)
- 3) Year ranges to parameterize maturity at age
 - Average of 1966-2009 (available by periods)
- 4) Year ranges for parameterising selection (exploitation pattern in the fishery)
 - 2007-2009/2010
 - 2004-2009/2010
- 5) Parameterization of errors in assessments./CV of stock numbers by age in 2009 (from SAM model):

a2 a3 a4 a5 a6 A7 a8

0.186 0.142 0.122 0.128 0.171 0.195 0.231

Western Baltic cod (SD 22-24):

- 1) Year ranges for R and SSB defined by year classes
 - Entire assessment time series (1970-2009/2010)
 - 1986-2009 (low recruitment period, starting year in line with long-term simulations of MP; Bastardie *et al.* 2010)
 - Recent 1994 to present (if necessary by rescaling mean) based on ecosystem study showing transition finishes in 1993
- 2) Year ranges to parameterize weight at age
 - 1982-2009/2010 (for earlier years constant values are used in assessment)
 - 2008-2009/2010 (due to recent drastic decline)
- 3) Year ranges to parameterize maturity at age
 - 1970-2009/2010
 - 2008-2009/2010
- 4) Year ranges for parameterising selection (exploitation pattern in the fishery) 2008-2009/2010
- 6) Parameterization of errors in assessments/ CV of stock numbers by age in 2009 (from SAM model) :

a1	a2	a3	a4	a5	a6	a7	a8
??	0.438	0.231	0.188	0.188	0.200	0.211	0.237

Results from simulations

Main results should be presented in terms of Quantiles of SSB, F TAC, catch and landings, variability in landings from y- y. For the Baltic RAC it is important to illustrate the way in which landings fluctuate up and then down based on uncertain advice and variable recruitment. This needs to be contrasted for different % constraints on annual change in TAC. A suggestion to illustrate this is the proportion of times a TAC reversal occurs by year through time in the simulation (i.e. number of populations where either an increase is followed one year later by a decrease or a decrease is followed by increase as a proportion of populations modelled)

Considerations on efficiency in effort measures and optimal effort distribution at fleet / and fishery level in relation to objectives:

Flexibility limits within and between fleet segments:

- o Currently effort is linked to vessels but the number of vessels is not controlled. Consider the development of flexibility within the effort system for example; unidirectional or bidirectional effort transfer among segments and within segments. Consider among other aspects what should be done with effort increases when F is below target. What are the implications?
- o Can we set a total effort (kWdays) limit which should not be exceeded for each stock?

- Can we re-distribute effort within and between segments without increasing total effort (E) and fishing mortality (F) and still reach the management targets?

Methods for evaluating the above considerations and approaches:

- Above listed methods and additionally the below;
- Compare efficiency of effort (and capacity) measures (kWd, fishing activity) – comparison of different measures as well as in relation to developments in F (F~E-relationship) (Coordinator: Rasmus Nielsen, DTU Aqua).
- In relation to used effort measures and baseline effort settings evaluate relationship between F and E overall by management area and cod stock – and possibly by fishery/fleet in relation to potential fishing power differences (efficiency between fishery/fleet and variability and temporal development herein) – see above (Coordinator: Rasmus Nielsen, DTU Aqua)
- Discuss potential issues with effort re-allocation between vessels according to fisheries segments (areas seasons, and fleets etc.) (Coordinator: Jesper L. Andersen, FOI & Rasmus Nielsen, DTU Aqua)

Certain small scale fisheries, in particular large meshed gillnet fisheries, have specific issues with days at sea limitations and effort measures.

- In relation to relative steaming time (long distance fishing)
- In relation to relative (low) cod catch

Can effort measures be made more efficient in relation to those fisheries?

Methods for evaluating the above considerations (Coordinator: Tiit Raid, EST):

- Document and discuss effect of effort restrictions for large meshed gillnet fishery targeting flatfish (in relation to their relative landing and discard of cod)
- Impact on flatfish stocks - and impact on harbour porpoise in WB Sea?
- Document landings and discard data as well as effort data for these fisheries and developments herein by country and area: To what extent do they catch cod? Is discard of water dead cod a problem? Other by-catch in those fisheries? Is effort restrictive for these fisheries?
- Discuss efficient effort measures for certain small vessel fisheries with relative high relative part of steaming in the trip days?
- Draw conclusions regarding the effectiveness of effort control at controlling F in the Baltic.

(Coordinators: C. Raddtke, MIR & T. Raid, EMI)

Data needs for 4.3.1:

- Use of data from the official data call for fleet economic scientific data concerning 2002-2011 (Annual Economic Report 2011).
- ICES WGBFAS 2011 Output
- Data listed in the action, task allocation and data retrieval table (Table 4.1) below

4.3.2 Bio-economic evaluations and cost effectiveness of effort and TAC regulation on fleet basis

Considerations in relation to management objectives:

- The choice of management system and its implementation will have economic effects on fleet basis. Different management systems will have different effects. Investigation of the magnitude of these economic effects on the fisheries can be determined using a bioeconomic modelling framework, given different stock situations and management systems.

Methods to address the above considerations (Coordinator: Jesper L Andersen, FOI):

The Study on the remuneration of spawning stock biomass (Call for tenders MARE/2008/11 – Lot 3) developed the FISHRENT-model, which can be applied to analyse management systems based on TAC and/or effort regulation. The analysis will be based on relevant economic indicators, when addressing these considerations.

Draft text to draw conclusions regarding use of effort and TACS from an economic perspective (Jesper)

Data needs to address the above:

- Use of data from the official data call for fleet economic scientific data concerning 2002-2011 (Annual Economic Report 2011).
- ICES WGBFAS 2011 Output
- Data listed in the action, task allocation and data retrieval table (Table 4.1) below

4.3.3 Effectiveness of area closures to improve recruitment

Considerations in relation to management objectives:

Describe purpose of closures, with respect to protection of certain life stages (protection for spawning individuals in spawning areas and periods) and/or high density areas.

E. Baltic cod: Make proposals for alternative spawning stock closures (including potential dynamic closures) to existing summer closures (E. Baltic cod) based on information on spawning sites and areas and production of survivors among other including information on back-tracing survivors from hydrodynamic modelling, as well as in relation to effort allocation of different fisheries.

W. Baltic cod: The seasonal spawning stock closure (April) for W. Baltic cod will be more difficult to evaluate and give alternatives for as the knowledge is more limited on spawning sites and areas and there exist so far no hydro-dynamic modelling results for back-tracing survivors. Timing of closures according to existing knowledge on spawning time and changes herein by area within the W. Baltic Sea will be discussed.

Methods to address the above considerations and approaches (Coordinator Christopher Zimmermann, vTI-SF):

- Discuss and qualitatively assess optimal closures according to recent knowledge and development in allocation of spawning sites and seasons and production of survivors from the different sites, and in relation to spatio-temporal patterns in allocation of fishing effort, and in relation to precision in knowledge;
- Look at ripe and running fish occurrence to define temporal and spatial extent of seasons.
- Summarise from review of distribution patterns of juvenile cod from surveys (SGMOS-10-06b) as basis for potential area closures;
- We cannot assess quantitatively what effect this will have on recruitment. It will not be possible to qualitatively evaluate the bio-economic (fisheries/fleet) impacts of the alternatives (scenarios) as proper spatio-temporal disaggregated bio-economic multi-fleet-multi-stock fisheries model are not properly informed to make such evaluation;
- Describe accuracy and spatio-temporal coverage of data behind the above mentioned indications and analyses in order to establishment of spatial scale for efficient closures;
- Draft text on conclusions if area closures do or do not make a significant contribution to management. (Chris Zimmermann)

Data needs to address the above:

- Recent published results from hydro-dynamic modelling;
- ICES WGBFAS April 2011
- EU fisheries data (see Table 4.1below) and Russian fisheries data;
- Possibly data from data requests under the EU Lot1 Discard Evaluation Project (Contact: Joakim Hjelm, IMR-S)

4.3.4 Influence of TAC constraints in change of TAC (established for economic reasons) with respect to the regulation

Considerations in relation to management objectives:

The TAC constraints with restrictions on relative change of TAC within the management plan has been established for economic reasons but is also in relation to the above evaluation of effort management compared to TAC management tested for bio/economic response. In present context it should be considered whether changed constraints will be biomass level dependent and affect robustness of the management plan.

A simple evaluation on stock basis of change of the TAC constraint of +/- 15 % can be made with respect to reaching the targets of the long term management plan given low recruitment under scenarios of e.g. 12-25%.TAC change (similar to the simulations made under SGMOS 10-06).

Should a TAC constraint biomass level dependent?

Bring out how often larger increase are followed quickly by declines in stock given different constraints and define a metric for this.

This will be most relevant for E. Baltic cod for which this TAC constraint is in effect for the time being. However, such evaluation cannot be made independent of effort restrictions as there might not be available effort to take additional TAC, but this depend on the harvest rate given abundance.

Methods to address the above considerations and approaches (Coordinator: Rasmus Nielsen DTU Aqua):

- Simulations with two-stock model from SGMOS 10-06b (See documentation in section 4.3.1)
- Draw conclusions on the utility of TACs to control catch

Data needs to address the above:

- Fisheries data as defined in the task distribution, action plan, and data retrieval table (Table 4.1) below;
- Assessment results from ICES WGBFAS April 2011

4.3.5 Biological (population dynamic) variability impacting effect of regulations and the management plan

Considerations in relation to sensitivity analysis of management options in relation to objectives

- Impact on the management plan of degree of mixing and migration between stocks in especially in SD24
- Changed growth (MWA) and maturity in SD 24 and SD 25: Is the management plan robust to changes in growth (mean weight at age) and maturity (fecundity) (recent/historic levels, regime shifts) for the cod stocks with special emphasis on the Western Baltic cod stock? Where necessary considerations influence of age reading errors, For example similar fleets from different countries have different age distributions in their landings for the Eastern Baltic cod and is an area specific difference or a result of different age reading methods.

Methods to address the above considerations:

- Mixing – migration (Coordinator: Rasmus Nielsen, DTU Aqua):
 - Evaluation of different scenarios of mixing/migration using information from recent scientific reviewing, literature (e.g. tagging studies) as well as information from recent preliminary analyses of frequency distributions of otolith types by area (SD 24, 25, 22) by simulation using the simulation model used in SGMOS 10-06b;
 - Possibly evaluation of different scenarios of growth and maturity in relation to the below by simulation using the simulation model used in SGMOS 10-06b; Parameters and settings for this are listed above (See documentation in section 4.3.1).
 - Discuss possible impact of different age reading methods
 - Conclude if mixing is or is not an important issue for management

Data needs to address the above:

- Fisheries data as defined in data table (Table 4.1)below;
- Assessment results from ICES WGBFAS April 2011

4.3.6 Effectiveness of additional technical measures, and possibilities to improve the acceptance of the measures in the fishery (Coordinator: Christopher Zimmerman, vTI-SF)

Considerations

Apart from the effort and TAC limits the long-term plan has set, there are a number of technical measures implemented in Baltic Sea fisheries. For the target species cod, these comprise minimum landing size, and a variety of partly extremely detailed descriptions of the gear to be used. There are indications that the recent increase of the mesh size in one of the legal gear has not improved selectivity (see Report SGMOS 10-06b). This indicates that the ability of management to improve selectivity with the present approach (detailed regulations, focussing on one part of the gear only – the cod end) might not be useful in all instances. At the same time, very detailed regulations are often perceived as overregulation by those regulated, and thus only comply with the plans reluctantly. Alternative approaches should be considered, such as a deregulation together with a result based management, which would incentivise an improvement of selectivity without a detailed description of the gear. The same holds for a minimum landing size, which was originally introduced to protect juvenile fish but is now the reason for discarding of large amounts of fish when a stronger year class enters the fishery.

Methods

- Analysis of the change of selectivity following the change of technical measures in the recent past; evaluation of trials concerning a result-based management (such as the Danish Catch Quota Management-system).
- Conclude whether there is a need for existing technical measures and/or additional technical measures.

Information and data available and needed

Data on the change of selectivity along with the change of technical measures is available or underway (vTI-OSF, DTU Aqua, MIR), results for the Danish-German-Scottish CQM approach will be presented and discussed in mid-May during a workshop convened by the Danish Ministry for Agriculture. This information can feed into the considerations for the setup of an amended cod management plan.

4.3.7 Potential impact and possible inclusion of additional removals, namely from recreational fisheries and discards (Coordinator: Christopher Zimmerman, vTI-SF)

Considerations in relation to management objectives:

The current management plan regulates legal landings and effort of the commercial fishery. The scientific assessment conducted by ICES considers discards and unreported (illegal) landings in addition. Recreational fisher's catches, which are potentially important additional removals at least from the Western Baltic cod stock, are not considered at all. Strategies are presented here how to include recreational fishers catch and discards into the management during the next 5 yrs.

Methods to address the above considerations and approaches:

- Evaluate time series for recreational fishery (Coordinator: CS, vTI-SF)
- Evaluate time series for discard (Coordinator: Joakim Hjelm, IMR-S)

- Shortly describe the extent of presently not included removals, development of strategies to increasingly include these in management and assessment – focus on implementation within a 5 yr period, required changes and options for management. (Coordinators: CS, vTI-OSF, Joakim Hjelm IMR-S)
- Discuss impacts and risks in relation to the management of not including this information (both recruitment and F should be changed by inclusion). (Coordinators: CS, vTI-OSF, Joakim Hjelm IMR-S)

Information and data available and needed:

ICES reports for discards from the two stocks, DCF reports for removals by recreational fisheries.

German Danish report (vTI-DTU Aqua);

Danish economic reports (FOI)

4.3.8 Activity / action and data provision list for section 4.3:

Data needs for addressing the above considerations and methods for the evaluations of effort regulation overall:

Table 4.1 Action, task allocation and data retrieval table

Type	Details	Provider	Receiver & Deadline
Assessment data and year ranges	2010 ICES assessment data for Eastern and western cod stocks Input data files (Eastern cod already on ICES WGBFAS site) By stock agreed yearclass ranges for: Recruitment/ssb, Meanweights maturity Selection Multiple options as needed	Rasmus Nielsen and Margit Eero, DTU Aqua & Joakim Hjelm, IMR-S	John Simmonds 1 st April 1 st April List supplied above should act as a minimum list to be extended if required.
EU Fisheries data 2003-2010	Country, year, quarter, reg area, ICES Rectangle, reg-gear, mesh size, DCF metier, fishing activity (trip days), kWd, landing (by species, all species, tons), discard (by species, all species, tons)	H.J. Raedtz through J. Simmonds	J. Rasmus Nielsen, DTU Aqua Data to 2009 1 st April 2011 Update 2010 15 June
Russian Fisheries Data 2003-2010	Russian effort (hours of trawling, trip days) and landings (tons) by gear and vessel length group (<8m, 8-10m, 10-12, 12-18, 18-24, 24-40, >40 m) for the period 2003-2010;	Uri E., Russia	J. Rasmus Nielsen, DTU Aqua 1 st May 2011
Fleet capacity and capacity utilization data:	National data on capacity ceilings (kW) and capacity utilization for the Baltic by year for the period 2005(-2010) by year; All countries have special permits for cod fishery. No. of fishing permits per country per year 2005-2010. No of vessels by gear and area having been active (having landed cod) in a) E. Balt. Sea, b) W. Baltic Sea, and c) both areas together?	To be delivered from the national administrations and research institutes by the following coordinators: DK: B. Pallisgaard & J. R. Nielsen D: Christopher Zimmermann S: Joakim Hjelm PL: Christoph Raddtke EST, LAT, LIT: Tiit Raid	Katharina Jantzen, vTI-SF 1 st of June 2011
Economic data:	Use of data from the official data call for fleet economic scientific data concerning 2002-2011 (Annual Economic Report 2011).	JRC	J. L. Andersen, FOI Provisional submission: 1 st May Final submission: 1 st June
National effort quota and quota uptake data	National data on effort quotas and relative quota up-take (and allocation) by year and management area (E. Balt. Sea, W. Balt. Sea, E+W	To be delivered from the national administrations	J. Rasmus Nielsen, DTU Aqua; At latest 1st June 2011

	<p>Balt. Sea) for the period 2005-2010 by fleet (worked out on individual vessel basis). Two possibilities for delivering this, i.e. Data Table or Frequency Plots by nation:</p> <p>Data Table: Number of fishing days for each vessel by year (period 2007-2010) for each management area and in both management areas (W. Balt. Sea, E. Balt. Sea and W+E Balt. Sea) with information on fleet and number of days available by management area.</p> <p>Frequency Plot: Frequency plot of number of vessels as function of fishing days (divided into 0-10, 10-20 day groups) by fleet and year (period 2007-2010).</p> <p>The Query Tables are given in Annex</p>	<p>and research institutes by the following coordinators:</p> <p>DK: B. Pallisgaard & J. R. Nielsen</p> <p>D: Christopher Zimmermann</p> <p>S: Joakim Hjelm</p> <p>PL: Christoph Raddtke</p> <p>EST, LAT, LIT: Tiit Raid</p> <p>EU FIDES: Edgars with respect to quota utilization</p>	
Control and Enforcement Data	National Control costs for the Baltic cod management plan?	National administrations through the national coordinators listed above	J. L. Andersen, FOI 1 st June 2011
Compliance data	National contents of national control action programmes (Annex II): Level of inspection by year in total and in relation to cod fishery. Number of violations in relation to the cod action plan by year in the period 2007-2010	National administrations through the national coordinators listed above;	Christoph Raddtke, MIR 1 st June 2011
TAC Quota and TAC Quota uptake	National TAC of cod by management area and stock and quota uptake by country by year for the period 2005-2010	National administrations through the national coordinators listed above contact persons:	J. Rasmus Nielsen, DTU Aqua 1 st June 2011
ICES Assessment Output April 2011	Output and results from ICES WGBFAS April 2011	ICES WGBFAS; ICES	Full Subgroup
Implementaion errors	Estimates of implementation error	Preliminary values 1 st April?	Full subgroup and John Simmonds

4.4 Overriding considerations of the Options

Consideration

Identify if there are significant parts of the any options that are unlikely contribute to the overall objectives

Identify if in the opinion of the evaluators the options are likely to be able to deliver the objectives of the plan.

Approach to address the above considerations:

Coordinators of sections (4.3 above should prepare draft conclusion regarding TAC / Effort / Closed areas / Gear related technical measures. As part of their studies

4.5 Environmental Effects of the Options

4.5.1 Evaluation of the effects of the multi-annual plan options on the fishery

Considerations

Show what is expected to be the resulting impact on landings and the fleet of any of the following aspects that are affected by the plan options:-

- Catch / landing and effort limitations – either through TAC (TAL) or effort management expected to result from the different options.
- The following will be considered if found significant above and will be dealt with by discussion (unless specific simulations are available) Currently proposed biological simulations (4.3.1) do not effectively show differences between these measures.
 - Technical measures – e.g. Closed areas, gear restrictions, etc. that are included in the options.
 - Control and enforcement measures proposed – e.g. Entry and exit rules, allocation rights, etc. and any exemptions,
 - Capacity management measures that are included in the options,

What is the expected fishery response to the different options? The response strategies of the fleets include possible shifts to other stocks or species, to other gears or métiers, changes in discard and slippage and other behavioural issues.

Approach to address the above considerations:

Use simulations from Section 4.3.1 to illustrate the outcomes from different targets and strategies (Rasmus to draw results from simulations)

As there is no fully implemented and parameterized fleet based and spatial and seasonal explicit bio-economic simulation model available for the full international Baltic cod fishery it will not be possible to evaluate specific fleet and fishery response to the different options among other in relation to response strategies of the fleets including possible capacity changes, shifts to other stocks or species, to other gears or métiers, to other fishing areas or seasons, changes in discard and slippage, and other behavioural issues. (Jesper L. Andersen from Fish Rent Evaluations);

4.5.2 Evaluation of the effects of the options on the stock

Considerations

a) *Evaluating the stock response to the changes in the fisheries resulting from the plan - will the options deliver their own internal objectives with respect to the stock?*

b) *Evaluating whether the values of target and other reference points referred to in the plan are consistent with current knowledge and the objective of achieving MSY by 2015.*

- *Are the reference points in the plan appropriate given the current information on stock status and dynamics?*
- *Are the options likely to achieve FMSY by 2015? If not, why? (see note 1)*
- *Are the options likely to be considered precautionary. If not, why? (see note 2)*
- *Is there a need to propose all the measures in the plan to make it capable of achieving the objectives? If so is STECF able to propose simpler options for a better plan to achieve stock – specific objectives?*

Basis of Data – 2011 assessments? Dates available and issues with agreement with WG results?

Specify modelling Basis for S/R growth and fishery parameters

Specify scenarios required

Approach to address the above considerations:

Use simulations from Section 4.3.1 to illustrate the outcomes for different targets and strategies (Rasmus to draw results from simulations)

Actions: John Simmonds to circulate some sensitivity analysis in May and Rasmus/Margit Circulate Working Doc on simulations at least 1 week before June meeting

Validation

The simulations will be validated through comparison between work done in FLR described in section 4.3.1 and equilibrium models described below, which will be run with the same parameterisation to check model outputs

4.6 Evaluation of the effects of the multi-annual plan on the ecosystem.

Considerations

- • *What impacts of the different options plan on the ecosystem can be identified? Ecosystem impacts might include changes in discarding practices, by-catch rates, and catch of non-target species, habitat degradation, etc.*
- • *What will be the effect on agreed indicators or descriptors that are directly (and where possible indirectly) affected by the options.*

Consider what are the implications for different levels of exploitation due to species interactions.

Methods and approach

Morten Vinther, DTU Aqua, and Joachim Hjelm, IMR-S to bring out perspectives from SMS / Integrated assessment: Produce discussion on this basis. Including sensitivity to assumptions of the model.

Action: Morten Vinther, DTU Aqua, and Joachim Hjelm, IMR-S to circulate WD at least 1 week prior to next meeting

4.7 MSY objectives, F_{MSY} reference points considering also multi-species aspects (Coordinator: DTU Aqua)

Considerations

Eastern Baltic cod

The most recent ICES advice (ICES 2010) estimates $F_{MSY}=0.30$ for Eastern Baltic cod is based on stochastic simulations. F_{MSY} is close to the most recent estimate of F_{max} (0.29) from yield per recruit analysis.

The estimations of F_{MSY} are based on the traditional ICES approach, where mean weights, proportion mature and natural mortalities are assumed constant. There are clear evidence from both models and observations that such stability is not realistic.

Observations

Mean weights at age in the catch (and stock) have decreased considerably in subdivision 24 and 25 in most recent years and influence both cod stocks (Figure 6.4 lower part from SG-MOS 10-06 part e).

Models

Models (e.g. MSVPA, 4M, SMS) for estimation of predation from cod on herring, sprat and cod has been developed and applied by ICES (e.g. WGSAM 2009, WKMAMPEL 2008) for the last twenty years. Predicted stock development and management advice can be very different from models with fixed mortality. For cod, this is mainly due to cod cannibalism, where predation mortality on younger cod increases with an increasing cod stock. In addition a large cod stock will decrease the stock of the main prey species herring and sprat, such that a larger proportion of the cod diet will be cod. Based on model runs, F_{msy} is estimated significantly higher (around 0.60) from models with estimation of natural mortality (e.g. WKREFBAS 2008). B_{msy} is estimated considerably lower than for single species models and closer to the historical highest stock sizes than seen for single species estimate.

ICES (WKREFBAS 2008) looked at reference points in 2008 and concluded that “the target F level of 0.3 can be seen as a risk averting strategy considering current environmental conditions, and implementation and assessment errors. Also, an F of 0.3 is close to F_{max} (0.27) derived from yield per recruit analysis (ICES, 2007b). However, WKREF (ICES, 2007a) stresses that this should be considered as an adaptive management plan and would need to be revised in the future. In the case of full compliance with harvest rules (i.e. no implementation error) and low assessment error, an F ~ 0.6 would imply low risks (< 5%) of SSB falling below B_{lim} “. The B_{lim} value referred to is a value of 160 000 t.

Given the much improved enforcement since 2007 and the improved environmental conditions with higher cod recruitment, the concerns about a higher F than 0.30 can be relaxed, such that a higher F_{MSY} than 0.30 becomes relevant.

Based on an updated data set (1975-2010) Denmark will perform MSE using the SMS model to show likely outcome of applying various levels of target F for cod on both the cod stock and fishery, and for the main prey species sprat and herring.

Single species stochastic evaluations based on multiple S-R functions with recent and long term growth and recruitment and including discarding will be used among others to evaluate the influence and sensitivity to uncertainty in S-R functions these will include models such as Ricker that imply cannibalism at higher biomass. (John Simmonds). Preliminary results will be circulated in April. If considered useful the results will be updated in May and circulated following the WGBFAS. A set of model parameters will be provided to match FLR requirements for use in modelling if required.

Western Baltic cod

For Western Baltic cod, F_{max} from yield per recruit analyses corresponds to 0.24 (ICES 2010). Stochastic simulations were conducted (Annex H of SGMOS 10-06 Part e) to estimate F_{msy} assuming different stock-recruitment relationships. The analyses resulted in F_{msy} estimates between 0.21 and 0.55, depending on the stock-recruitment relationship used. As historically the stock has been exploited at F_s near 1 for most of the time series exploiting at such different harvest rates implies correspondingly high biomasses, SSB between 300 -1200 kt, exceeding ten to forty times the level of current SSB. Such high biomasses clearly show the shortcomings of analyses without density dependent changes in growth and mortality.

Multispecies assessment for the Western Baltic includes the years 1977-2001 (SGMAB 2004). The data set for the model has not been updated since and it will probably not be possible to make estimates of F_{msy} in a multispecies context before the next SGMOS meeting in June 2011.

Investigation of the stability of F_{max} suggests that the value of 0.24 is not particularly sensitive to changes in cannibalism at young ages and weights at age. It should be noted that the mortality and mean weights were kept constant within a run and do as such not reflect any of the dynamic build in the multispecies models. Therefore a conclusion that variable mortality and mean weight have limited effect on F_{msy} cannot be made.

Currently the available proxy for F_{msy} is F_{max} . However, F_{max} is not suitable as F_{msy} for a stock like western Baltic cod where a clear effect of cannibalism and density dependent growth and maturation has been observed and estimated from models.

A reduction of the present F (around 1) down to F_{max} will require a substantial effort reduction which will have severe socioeconomic consequences. An F_{msy} proxy higher than F_{max} seems appropriate, at least as an intermediate step, to follow the stock development.

Single species stochastic evaluations based on multiple S-R functions with recent and long term growth and recruitment and including discarding will be used among other evaluate the influence and sensitivity to uncertainty in S-R functions these will include models such as Ricker that imply cannibalism at higher biomass. (John Simmonds) . Particular attention will be paid to recent reductions in growth and recruitment. Preliminary results will be circulated in April. A set of model parameters will be provided to match FLR requirements for use in modelling if required.

Actions: see work to be circulated under 4.5 and 4.6

4.8 Social and Economic Effects of the Plan

Considerations

Data and Calculation of Indicators

- *If there is no explicit socio-economic objectives defined by the multi-annual plan the options should be measured against the general socio-economic objectives as stated in the CFP.*
- *Will the explicit socio-economic objective defined by the multi-annual plan be met by the different options.*
- *The social and economic state of the fleets exploiting the stock or stocks concerned can be assessed using appropriate indicators, i.e. those proposed in the plan or those given below which include those proposed by STECF in the April 2009 plenary report.*

Longer term economic indicators over the period of the impact assessment should be obtained from cost benefit analysis.

- *Net present value*

Social indicators

- *Employment (and in other fishery sectors)*
 - *Salary ~ if data is available (in the future) to compare with other sectors (job market)*
- Identify what is possible – Data call is at level 4 data*
- If data is submitted it will be available by 23 May or earlier.*

4.9 Cost effectiveness of Control and Enforcement

Considerations

Do the different options have important differences in implementation costs against their effectiveness in delivering the objectives of the plan. (for example is one option able to deliver better conservation measures than another at comparable costs, or do both options has similar conservation properties with differing costs). There is currently no general methodology to provide a quantitative cost/benefit analysis of control and enforcement, however, if there are important aspects to be considered these should be described qualitatively.

Approach

Contact has been made with CFCA which confirms that they do not have enforcement cost data available. Enforcement cost data would need to be provided by MS. Currently there are no proposals to evaluate this further given the resources available.

Morten Vinther will provide a summary of what is available on fully documented on board catch monitoring costs.

The following sections will be drawn together at the June meeting based on the work described above. They are appended here so they can be consulted during preparation of the studies detailed above.

4.10 Conclusions to the Impact Assessment

Comparison of Options

- based on agreed criteria and draw-up a short-list of options that satisfy the Commissions Objectives for further discussion (Always include option « No Change»)
- Provide a summary table of options

Define what people would like to see to compare results **Graphs and Tables**.

- Screen possible options to see which can best meet the objectives using the agreed the criteria from the scoping meeting to be used to compare the options.

Effectiveness: best placed to achieve the objectives (select appropriately just to relate to the objectives given above)

- What would be the short and long term impacts for the stock(s) and fleets and linked economic sectors affected by the different options. Will the tactical objectives of the plan be achieved?
- What would be the short and long term impacts of the multi-annual plan on the environment and the ecosystem, for example by-catch, discards, non-target species?
- Are there any likely side effects that might result from the plan? (for example, changes in behaviour that affect other fisheries, or environmental consequences, changes in the market).
- Has the implementation been affected by external factors such as global change, ecosystems effects, or other fisheries?

Efficiency: cost-effectiveness

- What will be the impact of this plan in terms of for example employment, gross revenue of the fleet?
- Will there be any effects on the broader industry (processing, transporting, auxiliary)?
- What are the expected economic benefit/loss during the period of implementation?

Consistency: limiting trade-offs across the economic, social and environmental domains

- Are there important tradeoffs between the three main objectives of the CFP (economic, social and environment) that are importantly different amongst the options.
- Are is there any overriding major imbalances among the three main objectives of sustainable economic, social and environmental aspects.

Forward look to Evaluation

- Define a set of appropriate indicators to measure implementation, compliance, effectiveness, costs and other impacts.
- Plan for future evaluation or review of the policy initiative (when, by whom, what, how?)

Notes:-

- 1) Achieving targets (F_{msy})– means with 50% probability of achieving this by specified time
- 2) Precautionary approach criteria in agreement with ICES criteria (95% $SSB > B_{lim}$) (95% $F < F_{lim}$)

5 Plans for Cod in Kattegat, North Sea, West of Scotland and Irish Sea.

5.1 Introduction

The sections below indicate the questions to be answered taken from Annex A SGMOS-0902: *FRAMEWORK FOR THE EVALUATION* (in Italics) and the work proposed

5.2 A review of the practical implementation of the multi-annual plan

Provide the basic background of the plan (Commission)

5.3 Design Issues

- *What issues relating to the design of the plan can be identified. e.g. differences and/or ambiguity in interpretation of the requirements and/or provisions of the plan, or different levels of implementation of the plan. Analysis should be conducted at the Member State level.*

- *Has the plan been updated in the light of new information since first implementation e.g. have reference points been updated in line with more recent advice? no*

- *In the case of multi-species plans, are the procedures for setting the TACs for the different species likely to lead to imbalances in the TAC levels for the stocks concerned. This is not a ms-plan*

- *Has the potential overlap with other multi-annual plans been adequately addressed?*

EU – Norway: identify any weaknesses in design or implementation that undermine its effectiveness,

The following aspects of practical difficulties were identified this section will be expanded with any relevant information from work also contained under Section 3

Proposals for work and draft responses

The following aspects detailed by Article number from the cod plan (COUNCIL REGULATION (EC) No 1342/2008) have already been identified (though additional aspects may also be found to be relevant see section 5.3) and will form the basis of the response:

Interpretation issues, related to Articles 7 and 8

When performing the Impact assessment for the HCR components of Council Regulation (EC) 1342/2008 (Articles 7 and 8), difficulties were encountered when coding up the HCR elements, and several assumptions were required. The following details the assumptions were made when performing the impact assessment (MSE), and any differences that subsequently occurred in implementation when carrying out annual short term forecasts (STF).

Article 7

7(1a) Method for calculating expected quantity of discards for TAC year was not defined

Solution MSE: average discard ratio at age for final 3 years of data

Article 8

TAC calculations

8(1) Expected quantity of discards for TAC year (refer to 7(1a) above)

Solution MSE: average discard ratio at age for final 3 years of data (see above)

STF: discard ratio for final year of catch data

8(1) Calculating TAC [refer to 7(1a)]

Solution MSE: remove unallocated mortality prior to calculating TAC

STF: landings and discard components scaled up to account for unallocated mortality

8(3) cuts in F relative to 2008

Solution: MSE and STF: assume that F2008 is re-estimated by the assessment method, and not fixed to the value estimated by the assessment the first time the plan was implemented

Effort calculations

For both MSE and STF: there is nothing in Article 8 (equivalent to Article 7(4)) to say what should be assumed about effort cuts in the intermediate year. This is because for the HCR, Article 7 needs an estimate of SSB at the beginning of the TAC year (and therefore needs assumptions about what happens in terms of F), while article 8 only needs SSB at the beginning of the intermediate year. However, in order to calculate the TAC, one still needs to project the population forward through the intermediate year, and therefore one needs to know what happened in terms of F during the intermediate year.

This information will be checked prior to the report in June 2011 and moved into the report.

There is a requirement for a discussion of design issue problems associated with F targets and absence of exploitation values for some stocks. – Experience with rules. Criteria from the Commission Consultation on Fishing Opportunities for 2011 (COM(2010)241 final) can be used here. (Clara)

5.4 Enforcement and Compliance

What level of compliance has been achieved (using the background information provided above - analysis should be conducted at MS and EU level – i.e. MS implementation may differ and have differing outcomes)?

Effectiveness of Article 11.

- Describe the development of the criteria to judge the MS's requests for exemption by STECF through 2009. [Sarah/Norman will provide text describing what has been done (and reported in STECF reports) in 2009.]
- Document the MS's requests for exemption, the judgement of them by STECF, the decision on them by the Commission, and the subsequent fate of them. [Sarah/Norman]
- Are the criteria for exemption as specified in the regulation, (percentage cod catches <1.5%), and as applied by STECF for advice and as applied by the Commission for derogation appropriate? For example, when looking

at absolute (rather than percentage) cod catches by the vessels requesting exemption, is it reasonable to assume that the derogation of these vessels is not counter to the objectives of the plan? What proportion of the total stock's catches do these vessels catch? These aspects should be linked to compilation of results under the STECF Effort group– Norman Nick Alex will coordinate and work will be undertaken at the STECF Effort group looking at data from Ireland, UK, Germany, Sweden, France, Spain (1 year).

Effectiveness of Article 12.

Descriptions are needed by MS to show how the original baselines were calculated as well as how effort is recorded each year. Which year range, 2004-2006 or 2005-2007, was used for the baseline? How was a 'day' interpreted, e.g. as 24 hours? How were trips covering several areas dealt with? From this information it could be identified whether ambiguities exist and whether the plan allows for different interpretation by the MSs. It is no problem if MSs used different methods, as long as the same method is used consistently within a MS, i.e. for the baseline calculation the same method should be used as for the annual effort records.

It is considered that the material in the 2009 effort report does not adequately cover what is needed and it is expected the 2010 report material (in advanced draft stage and due in April) will also be insufficient. Although a summary report was started at the June meeting last year, and will be included in the Effort report, in common with the lengthier text section (also in the report) this remains incomplete, and some member states are still being hesitant in describing what they do. The process of drawing this out has been a long one though each year there have been improvements. Unfortunately there have been some member states (for one reason or another) who have revised methods and submitted new values on baselines to CION prior to Council rather than the effort meeting.

The effort group acts as a conduit for supplying the effort material for the cod evaluations and are already planning to provide effort and other data and if possible updating with 2010 data. This group will also be updating the data description sections in the effort meeting (in early June). This likely to be the best source of material for the cod evaluation report. It is therefore proposed to request the Effort group to provide this data to the June meeting of STECF EWG 11-07.

This task will be added to the ToR for the STECF Effort group and also circulated to those in the MS administrations who have responsibility to furnish data. They will be requested to give the latest description of their methods. They will be asked to confirm that they use the same methodology in recording effort (going forward) as they did for the establishment of their baseline figures (Nick)

- Ambiguities have been noted by the STECF November 2010 plenary in how percentages adjustment of effort as specified in Article 12.4 should be calculated. The text from that report, pertaining to the advice for TAC, should be

modified to highlight the problem in a more generic way in the context of the evaluation of the cod plan. (Sarah)

Effectiveness of Article 13.

- Are Articles 13.2.a, b, and d appropriate? For example, is the use of a percentage as in Article 13.2.b (5%) in accordance with the plan's objective? [No data input needed – discussion, to be provided by Norman/Sarah]
- Describe the impossibility to implement Article 13.2.c, e.g. for areas where no estimate exists of fishing mortality. For the application of 13.2.c it is explicitly required that the percentage by which the proposed activity reduces the fishing mortality for cod can be quantified. Is a more relative quantification of the reduced impact on cod possible? [No data input needed – discussion, to be provided by Norman/Sarah]
- Is Article 13.2.c appropriate in the light of the plan's objective? [No data input needed – discussion, to be provided by Norman/Sarah]
- Document the MS's requests for the application of Article 13.2.a, b, c, and d and whether they were granted by the Commission and in the case of 13.2.c evaluated by STECF based on the criteria STECF proposed in the July 2010 plenary, and whether STECF's advice was followed as stipulated in Article 13.7. [Edgars will provide this information.]

Effectiveness of Article 14.

- Descriptions are needed per MS of how the maximum allowable effort has been allocated to the (groups of) vessels flying their flag. For example, Article 14 allows for effort allocation towards vessels performing 'good behaviour', for example in terms of cod avoidance or fuel consumption. This is thought of as an incentive, by rewarding 'good behaviour'. [For the respective MSs Norman, Jan Jaap, Alex, Paul/Nick, Clara have volunteered to find and bring that information to the group. Jan Jaap to coordinate]

Effectiveness of Article 17.

- There may be issues with the transfer of effort between gear groups within MSs. The Irish transfer between TR2 and TR1 in VIa is an example [Norman].

Additional general reviews on the effectiveness of recovery plans and effort management will be provided as follows:-

Uncover project review: John S

Review of Faroes effort management: Clara

Summaries wider experience on effort management: Jan-Jaap

F-Effort studies: Sarah

5.5 Evaluation of the effects of the multi-annual plan on the fishery (Environmental effects pt 1)

- *What has been the fishery response to the multi-annual plan? The response strategies of the fleets include possible shifts to other stocks or species, to other gears or métiers and other behavioural issues.*

- *What measures of the multi-annual plan are considered to have influenced the fishery response. Measures of the multi-annual plan will include*
- *Catch and effort limitations – either through TAC or effort management*
- *Technical measures – eg. Closed areas, gear restrictions, etc.*
- *Control and enforcement measures – eg. Entry and exit rules, allocation rights, etc.*
- *What capacity management measures or changes have been used or observed*

5.5.1 Task : Document changes in catch and effort for manageable units

Detailed information on effort and catches of MS fleets operating in the 4 areas covered by the cod plan has been routinely compiled by the STECF SGMOS effort management group since 2007, mixed fisheries reports go back to 2004/3. The effort data in the reports goes back to 2000 in some areas and aspects, 2003 for others. Data on MS effort (kwdays), landings and discards are requested annually through a Commission data call and entered in a database held at JRC. Despite issues with some of the discard estimates, these data are considered to represent the most comprehensive resource available for evaluating changes in catch and effort occurring during the operation of the cod plans and will be used to generate background summaries for the evaluation.

Outputs and analysis addressing the work list below will be prepared prior to the next cod evaluation and hopefully updated with 2010 information collated at the STECF effort management meeting which takes place in early June. This is conditional on the timely submission of MS data according to the 2011 data call. Participants are requested to communicate these needs to national administrations.

Work to be tackled by members of STECF effort group.

5.5.1.1 Effort

- For each member state provide a summary of the methods used for calculating effort and establish whether the method has been consistently applied in both the setting of baselines and in the recording of effort use during the course of the cod plan (*Effort group participants*)
- provide summaries of effort trends for the gear groups operating in each of the four cod plan areas (*Nick*)
- For each of the areas, present time series information on MS effort uptake by gear in relation to the available effort (baselines) (*Alex, Clara, Nick*)

Norwegian information not available from STECF effort database

Information to be presented on Norwegian catch and effort distribution –or if possible a VMS study – see note under section 5.5.2 (Tore)

5.5.1.2 Catches

Identify shortfalls in discard (or landings) information which significantly impact the evaluation process. (*Effort group participants*)

Summarise cod catches in each area by MS and gear group (*Clara, Steve*)

For each area provide an update of the gears responsible for catching most cod (*Nick*)

Catch curve analysis

Investigate the quality of the catch at age data (landings and discards) for the main gears identified

Where reliable data are available, conduct catch curve analysis by gear in order to see if it is possible to obtain indications of changes in exploitation for stocks without assessments giving mortality estimates.

Log catch ratios (LCR) are used to identify changes in Z as the log ratio of the catch of a cohort in one year relative the same cohort the year before would be equal to the total mortality Z if the exploitation pattern was flat and the catches constant.

$$\text{LCR} = \ln(C_{a,y}/C_{a+1,y+1})$$

Assuming that selection (exploitation pattern) remains relatively stable changes in LCR from year to year are still distorted by any changes in total catch from year to year. A simple normalized version modified by the catch ratio in tonnes better reflects the change in Z. This correction is derived as follows using the catch equation the catch ration can be re-written in terms of the Z you are interested in and the F in both years:-

$$\text{LCR} = \ln(C_{a,y}/C_{a+1,y+1}) = (Z_y + Z_{y+1})/2 + \ln(F_y/F_{y+1})$$

Then F_y/F_{y+1} may be approximated by the ratio of the harvest rates based on catch in tonnes and SSB,

$$F_y/F_{y+1} = (T_y/SSB_y)/(T_{y+1}/SSB_{y+1})$$

If SSB is rather stable from year to year then SSB_y/SSB_{y+1} is approximately unity

$$F_y/F_{y+1} = T_y/T_{y+1}$$

Thus if SSB is stable a normalized LCR (N.LCR) can better reflect the change in Z

$$\text{N.LCR} = \ln(C_{a,y}/C_{a+1,y+1}) - \ln(T_y/T_{y+1}) \sim (Z_y + Z_{y+1})/2$$

Where $C_{a,y}$ are catch in number and the T_y are catches in tones. This normalisation should be applied in a LCR analysis if there is a perception that catches are likely to be changing more between years than SSB.

(*Norman Graham/Sarah Davie –Irish Sea; Steven Holmes-West of Scotland; Clara Ulrich –North Sea, Kattegat – John Simmonds- to provide correction for catch changes – done - see above*)

Experience in Norway, changes in selection / measured effectiveness of discard ban – to try to evaluate the utility of the approach ---- (*Tore*)

5.5.2 Task: Presentation of VMS information

Summaries of changes in spatial distribution of effort by gear are provided in the STECF effort reports. These are however, only available at the statistical rectangle level and are generally only useful in detecting gross, large scale shifts in effort distribution. For some areas such as Kattegat, rectangle data provide little value in describing spatial change.

VMS data provide scope to examine finer scale information, at least for larger vessels equipped with this equipment. Recent projects such as the (LOT II –details?) have progressed the use of this material and a number of participating MS are able to provide maps of their aggregate VMS data which may be more informative in describing changes in effort distribution than rectangle data.

Ideally an international database combining VMS data should be set up to provide an overall picture but at this stage with the exception of Denmark and Sweden covering the Kattegat this will is not possible. Given the time available for the current evaluation, an approach providing illustrative examples was agreed in which VMS from individual MS would be presented. Two broad work topics were identified.

Investigation of spatial changes in effort as shown by VMS

A two stage process was agreed in order to explore the utility of the available VMS data for detecting changes in distribution. Over a 6 week period (ending mid-April), those with access to VMS data will generate maps and compare these alongside plots of abundance of cod (where available). The objective would be to see if there was evidence of movement towards or away from cod aggregations Participants will circulate results and discuss inter-sessionally their approaches and whether a more substantive analysis should be performed and included as part of the cod plan evaluation.

(Nick, Clara, Morten, Alex Joachim etc.)

Specific studies relating to spatial measures in the cod plan areas

Several specific spatial measures are in operation in some of the cod plan areas. VMS data and associated catch data will be presented in an effort to determine whether the spatial measures benefit or hinder reaching the objectives of the cod plan. Examples identified so far include a) Kattegat closed areas (*Morten/Joachim*); b) western boundary of cod plan area in VIa (*Steve and Nick*); RTCs (*Nick, Jose etc*)

Nick – Norman to coordinate (through STECF / plenary contacts and Lot 2 participants for shelf edge VIa VMS data.

5.6 Evaluation of the effects of the multi-annual plan on the stock

Questions

a) Evaluating the stock response to the changes in the fisheries resulting from the plan - is the plan delivering its own internal objectives with respect to the stock?

- *What changes in the stock dynamics can be identified and to what extent are these consistent with (or attributable to) changes in the fishery imposed by the multi-annual plan?*

For example can reductions in fishing mortality be identified in instances where fishing effort has been reduced.

EU Norway Evaluate the performance of the plan in meeting its objectives,

5.6.1 Task: Document changes in stock.

The plans objectives are defined in terms of fishing mortality reductions. For some stocks, analytical assessments are highly uncertain, therefore evaluating this aspect of stock change may be difficult, while for other stocks an analytical assessment is available.

In the case that there is an accepted assessment, in a first step it is possible to evaluate if the fishing mortality has reduced as intended since the implementation of the plan. This means that the exploitation rates should be inspected using the latest assessment, and compared to the fishing mortality in 2004, 2008 respectively. In the case where no reliable fishing mortality estimate is available from analytical assessments, proxies such as biomass trends can be used to judge whether biomass is above B_{pa} or B_{lim} as specified in the regulation. In addition to the biomass proxies, changes in the productivity of the stock should be evaluated. In a second step, the focus is on the implementation details causing the deviations from the plan.

5.6.1.1 Step 1 Evaluating if objectives are achieved

For the Cod stock in the North sea, the analytical stock assessment put forward by the ICES benchmark working group in 2011 can be used, updated by WGNSSK 2011(18 May). This assessment has fishing mortality estimates, including uncertainty. Besides the analyses based on the median estimates, probabilities of reaching plan objectives can be derived.

In the Kattegat, WKBFAS (on 29 April review 6 may) the assessment used for advice in ICES suffers from uncertainty in the fishing mortality in the last five years. This uncertainty is caused by uncertain estimates of unallocated removals. The biomass is less sensitive to the level unallocated removals and is estimated to be below B_{lim} in the last ten years. Information from the fishing industry and the Member State administration could inform the evaluation process about the reliability of unallocated removals. This could be done in the context of the RACs data task force. In the absence of additional information an evaluation should be done under different assumptions of unallocated removals.

The West of Scotland and Irish Sea cod stocks pose similar problems (23 May review June). The level of unallocated removals cannot be estimated with certainty and fishing mortality and natural mortality cannot be distinguished (probably a trend over time in natural mortalities due to increasing seal populations in the west of Scotland). One potential way forward is to put an upper bound on the natural mortality assumption, resulting in fishing mortality estimates. Biomass can be evaluated under different assumptions of unaccounted removals. In the light of the uncertainty of the assessment, Z and SSB can be interpreted based on trends rather than on absolute values. Nick to check what might be available regarding trends in M .

Because of the uncertainties in several of the assessments, alternative exploitation indicators could be used to evaluate trends in fishing mortality. However, these are currently not available. ICES expert groups should be asked to provide such indica-

tors for those assessments of exploitation rate that are not accepted by ACOM. If there is to be a change of basis for assessments this must be circulated to the group via the chair (John Simmonds).

Finally, specific data needed to improve assessments should be identified and put forward. The RAC data task forces can play an important role here. In the longer term benchmark assessments are needed for West of Scotland and Irish Sea cod stocks ICES needs to ensure these stay on the lists for 2012. RAC / ICES group to provide feedback from group identifying data deficiencies.

5.6.1.2 Step 2 Evaluation of reasons for deviation

In order to elucidate the source of the deviations from the plan, several analyses have to be carried out. The following should be established

2.1 Estimate the difference between the TAC advice according to the plan, based on the historic assessments and the actual TAC decided by the council. / estimate from short term forecast what was the advice implied. (It should be noted here if effort was changed appropriately too)

2.2 Estimate the how the catches were limited by the TAC (which in effect only limits landings) as expected. To this end, the proportionality assumed between the different sources in the catch (discards, landings, unaccounted removals) may have changed over time.

2.3 Analyse whether assumptions and results from the short term forecast on which the advice was based were consistent in retrospect or whether they have contributed to the deviations from the planned exploitation. The following procedure can be used:

For each of the years y ranging from 2004 to 2010 for which an advice was given, and assessments are available, the assessment and short-term forecast output derived in the assessment year $y-1$ can be used to compare F , SSB , landings, discards and total catch (including unallocated removals) with the actual observations in catch year $y+1$. This means that a comparison is made between the "original assessment and short term forecast" used as a basis for the advice and the latest 2011 assessment that is the current best estimate of the stock trajectories. This requires information from both the historic short term forecast input data and assumptions and the 2011 assessment. If differences are found then to determine if the forecast assessment, forecast or fishery is primarily responsible short term forecasts will be run from the states of the stock taken from the 2010 assessment.

The main descriptive part and pulling out Assessment info for step 1 and step 2 except for part 2.3 of step 2 (Alex / Jan-Jaap).

For the final analysis (2.3) Stock responsibility Steve – WoS Jose – NS Matt Parker-Humphries –IS Margit Eero – Kat. Robb Scott and John S to coordinate and carry out preliminary work and contact others regarding preferences for how to organise this and how this can be coded.

5.6.1.3 Documentation of Assessment and advice

ICES old electronic copies of WG files have been acquired and downloaded from ICES. Historic advice sheets from ICES, Commission policy documents (2006 to 2010, earlier versions are not thought to be helpful), STECF autumn plenaries (2004 to 2010)

and stock reviews will be checked for 'cod' advice. All these documents will be placed on Sharepoint to allow access (John)

5.7 Reference points and MSY by 2015

Questions

Are the reference points in the plan still sensible given the latest information on stock status and dynamics?

EU Norway - To evaluate whether the values assigned to the precautionary are valid

EU Norway - Indicate whether the target fishing mortalities rate of 0.4 is consistent with MSY for the stock;

- *Is there a need to revise the measures in the plan to make it more effective in achieving the objectives?*
- *Is STECF able to propose options for a better plan to achieve stock – specific objectives?*

5.7.1 Reference points

ICES WKCOD provide the following view and the following text based on the WKCOD report (Executive Summary paragraph) has been drafted.

Although the SAM model structure agreed at WKCOD is considered the most appropriate that could be fitted in the time available, a refined model structure will only be completed with further work. Consequently, WKCOD consider that if further refinements are found to be required before the WGNSSK 2011 meeting, these be presented to that meeting for adoption (WGNSSK comprises a large part of WKCOD participants). In the medium term WKCOD considered that the development of a model structure that models discard and landings separately is required due to the differing levels of noise associated with each data set. WKCOD recommended that the reference points are not revised in the short term until the assessment model has been finalised. Conclude we wait for results but continue to accept current value as currently not impacting on exploitation is appropriate to wait.

The proposal from this group is to endorse this view but in the event that the meeting in June concludes that any revision to the plan is required then the issue of appropriate exploitation targets and reference points should be part of the ToR for any future evaluation.

5.7.2 Task: Medium term simulations to answer the question: "Is the plan likely to achieve MSY by 2015"

Questions

Evaluate whether the values of target and other reference points referred to in the plan are consistent with current knowledge and the objective of achieving MSY by 2015.

Is the plan likely to achieve MSY by 2015? If not, why?

EU-Norway Indicate any adjustments that should be made to harvest control rules to take into account recent low levels of recruitment

- 1) Investigate these questions for North Sea, Irish Sea and West of Scotland cod it is proposed that the same framework is used as as was already used for the Impact assessment of the HCR components (Articles 7 and 8) of Council Regulation (EC) 1342/2008 (Jose)

For Kattegat cod

The conditioning of the simulations in terms of starting values should be based on the most recently available ICES WG assessment (WGNSSK for NS cod, and WGCSE for IS and WoS cod)

- a) To do this use WG 2011 data (WGNSSK 4-10 May; WGCSE 11-19 May) however, to reduce time delays and ensure quicker production of results the simulations should be set in advance up based on 2010 assessments, and then updated with 2011 values when these become available.
 - b) It is anticipated that this will work for NS assessment. However, the assessments for IS and WoS may not be accepted – Under these circumstances the simulations could be run from a few years earlier where the results are rather more converged but then brought forward with appropriate uncertainty. In this case (which should only be used if the most recently accepted assessment is not accepted) the method used previously will be reused. This was to use B-Adapt bootstrap estimates from which to conduct the evaluation of the plan, and in the absence of accepted assessments, we could carry these forward given appropriate assumptions (realised landings and other data from assessment files, as these should be available, together with appropriate assumptions about recruitment and misreporting given recent "behaviour")
 - c) for NS cod only. It is necessary to testing for influence of different levels of predation mortality to account for effects of density dependent changes in mortality – one run will be done with natural mortality set to the value used in WG, a second run will be carried out to test sensitivity to natural mortality using a value based on the early time period where mortality estimates for the younger ages were higher (average of first 10 years).
- 2) The projections should take into account "current practices", i.e. differences between what the plan says in terms of F, and what is actually realised. The values to use will come from analyses from section 5.6.1.2 (comparing management plan F with realised F)
 - 3) A comparison will be made between modelled recruitment using reduced recruitment model with recent low observed values to see to check that the low recruitment model is capturing the low recruitments appropriately – if not then amend the low recruitment model to implement recruitment an appropriate level. The model should be run with the low recruit run option where F does not decline in line with the plan. Use options as specified below for both models for Recruits.

The following three options for implementation parameterised from section 5.6.1.2 should be used to test the sensitivity of the conclusions to different assumptions on implementation success.

Option 1 is fixed fractional implementation of desired change in F.

Option 2 is trend fractional implementation of desired change in F.

Option 3 perfect implementation – factor = 1

Communication between Robb Scott and Jose and others dealing with assessments regarding implementation factors.

The new assessment model allows for variable natural mortality (process error) In order the check that this has not changed the parameterisation of the stochastic simulation models for recruitment check that recruitment and natural mortality taken from SAM are appropriate for the fixed parameterisation in MSE software (Jose).

5.8 Evaluation of the effects of the multi-annual plan on the ecosystem (additionally to stock and fishery).

- *What impacts of the multi-annual plan on the ecosystem can be identified? Ecosystem impacts might include changes in discarding practices, by-catch rates, habitat degradation, etc.*

EU – Norway request an evaluation including the problem of discards and unaccounted mortality.

5.8.1 Task discuss mixed fishery and discarding together to highlight issues

The Cod management plans are by essence not multi-species management plans, and therefore their implications for other stocks and the potential overlap have not been addressed in the design of the plans. However, the ICES Working Group for Mixed Fisheries Advice for the North Sea (WGMIXFISH and STECF EFFORT group) routinely evaluates the potential inconsistencies between TAC levels and target fishing mortalities of all main demersal stocks in the North Sea, based on current levels of effort and catches, and provides advice about risks for TAC over- or under utilisation.

Such outcomes will be made available and further developed for the present evaluation of the North Sea cod management plan. (Resp: Clara Ulrich).

5.8.2 Task highlight approaches for reduction of impact

Describe the available gear types designed to reduce cod catches e.g. Swedish grid, separator panels, eliminator trawls and the gear group in which they are used. This should describe experimental results from trials, what is the expected impact on cod and other species and note any practical issues that may act as a disincentive – (Norman to coordinate)

e.g:

- TR2 – *Nephrops*
- Swedish Grid – Exemptions article 11 – Sweden (? vessels) and Ireland (3 vessels)
- Separator Trawl – Ireland (article 13- 2 vessels)
- Large Square mesh panels (Northern Ireland)
- SELTRA – DK
- TR1 – ‘Whitefish’
- Orkney Trawl – article 13 – UK

Quantify the uptake rates (no of vessels/effort) of 'cod limiting' gears by MS relative to the total number/effort by gear segment; have the use of these gears been proposed (by MS) and evaluated (by STECF) under article 11 and 13.2(a) or as part of a wider cod avoidance and discard reduction plan, 13.2(c) – data by MS.

Present the catch profiles by species between 'standard' and 'modified' gears including all target and non-target species, have the gears achieve the desired changes in catches/F – data by MS. What has been the impact on other catches – has there been an increase in landings of other species – has there been a change

Data requirements – landings (or catch!) profiles from appropriate gear group – regulated and derogated – is there any evidence of changes in targeting behaviour (and spatial shifts -VMS)

5.9 Social and Economic Effects of the Plan

5.10 Data and Calculation of Indicators

- If there is no explicit socio-economic objective defined by the multi-annual plan the evaluation should be against the general socio-economic objectives as stated in the CFP.

TASK –Jesper Sasha Katarine with framework from Clara

- 1) Indicator of state of the economic state of fleets as relevant background
 - 2) Draw directly from Annual economic report - John Contact Commission for permission to use economic data before report is published. Currently agreed but just for confirmation.
 - 3) Economists to define and discuss data needs with John prior to April STECF plenary
- Characterise the change social and economic state of the fleets exploiting the stock or stocks concerned as a consequence of plan and derogations using appropriate indicators, i.e. those proposed in the plan these below proposed by STECF in the April 2009 plenary report,.
 - *Value of landings* ~ revenue from sale of fish.
 - *Gross Cash flow* ~ income minus all operational costs (excluding capital costs).
 - *Break even revenue* ~ long term break even revenue. The income (revenue) level at which economic profit is zero.
 - *Gross Profit* ~ income minus all costs, including capital costs.
 - *Gross Value added* ~ contribution to gross national product (GNP). Income minus all expenses except capital costs and crew cost.
 - *Fleet size and composition*
 - *Employment*
 - The implementation and enforcement costs should be estimated, if possible in order to assess their cost effectiveness e.g. do the benefits outweigh the cost of implementation and enforcement.

5.11 What has been the added value of the multi-annual plan

The question “What is likely to have happened if the multi-annual plan had not been put in place?” should be addressed. This should include a comparison between the current state of the stock and fisheries compared to the situation that is likely to have occurred had the multi-annual plan not been implemented. The scenario representing the absence of the plan will constitute the baseline scenario, as advised by the desk officer.

- *With specific reference to the items identified in section 2, identify the benefits/losses to the fishery and to the stock that have resulted from the multi-annual plan. Analysis to be based on indicators of stock status and exploitation rate*
- *With specific reference to the items identified in section 3, identify the economic and social benefits/losses that have resulted from the multi-annual plan. Analysis to be based on suitable social and economic indicators.*

5.11.1 Task generate a Baseline

The Commission view is that the policy documents would have been used as a baseline if the 2008 policy had not been implemented. Use the study under 5.6.1.2 to try to evaluate if it is considered the response would be different, in terms of landings and catches. If so implement historic differences (Rob John) Pass info to Economists--- Hold discussion at STECF plenary April. Define what should be done here to make the comparisons. Agree parameterisation and what can be obtained on a biological basis / economic basis.

Section 5 from here onwards is the concluding questions for next meeting those carrying out studies detailed above should try to draw out aspects to be informative for questions below.

5.12 Performance Evaluation of the Plan

Based on the above analyses please answer the following questions.

NB: the judgment provided on the following questions could be qualitative (at this stage) where data are not available. Similarly if other effects are detected they can be considered.

Effectiveness

- *What have been the immediate results and medium term impacts for the stock addressed by the multi-annual plan? Have the objectives of the plan been achieved?*
- *What have been the immediate results and medium term impacts of the multi-annual plan on the environment and the ecosystem, for example by-catch, discards, non-target species?*
- *Have there been any side effects resulting from the plan? (for example, changes in behaviour that affect other fisheries, or environmental consequences, changes in the market).*
- *Has the implementation been affected by external factors such as global change, ecosystems effects, or other fisheries?*

Utility

- *What trends in fleet capacity (kW or GT) would have been expected from the implementation of the plan? What trends were actually observed?*
- *Are the fleets affected by the multi-annual plan in a situation of overcapacity?*
- *Did the multi-annual plan contribute to adapting the fleet capacity to the fishing possibilities resulting from the multi-annual plan?*

Efficiency (cost-effectiveness)

- *What have been the costs of this plan in terms of for example employment, gross revenue of the fleet?*
- *Have there been any effects on the broader industry (processing, transporting, auxiliary)?*
- *What have been economic benefit/loss during the period of implementation? STECF will require guidance on to whom this applies.*

Indicators

- *Were the indicators used sufficiently useful to evaluate the multi-annual plan?*

Sustainability

From the experience so far,

- *Is it possible to draw conclusions about the sustainability of the plan that differ from those envisaged by the initial impact assessment?*

5.13 Conclusions

Based on the answers to previous questions, please give us your global judgement on the plan

- *With regards to the utility and sustainability of the multi-annual plan and its contribution to the objectives of the Common Fisheries Policy.*
- *Is the plan succeeding in achieving its stated objectives*
- *Which elements of the plan have had the greatest influence in achieving the objectives.*
- *Are there any specific indicators that would be useful for a future evaluation of this multi-annual plan?*
- *Are there any additional data that should be collected in the future to help in evaluating the multi-annual plan?*
- *Should the plan be linked to other plans?*
- *Are there any elements of the plan that require revision? What are the proposals for revision?*

6 Whiting Advice

JOINT EU-NORWAY REQUEST ON A FUTURE LONG-TERM MANAGEMENT PLAN FOR WHITING

Text of the request

The response to the Joint EU-Norway request on the management of whiting in Subarea IV (North Sea) and Division VIIId (Eastern Channel) from ICES in September 2010 stated that "maintaining fishing mortality at its current level of 0.3 would be consistent with long-term stability if recruitment is not poor".

Consequently the EU and Norway have agreed to interim management of whiting at this level of total fishing mortality, conditional on a 15% TAC constraint.

On the basis that the whiting stock exhibits no relationship between spawning biomass and recruitment, ICES is requested to conduct an evaluation of:

- 1) the level and number of years for which recruitment is considered poor;*
- 2) the lower level to which fishing mortality should be reduced;*
- 3) the rate of reduction to the lower level in the event of poor recruitment*

Background

The dynamics of the whiting stock are heavily dependent on the level of recruitment entering the stock (Figure x). Whiting mature at an early age (11% at age 1, 92% at age 2, 100% from age 3 on) and fish at age 1 (recruits) and age 2 make a substantial contribution to the spawning stock. In general whiting is considered to have a recruitment - stock relationship rather than stock and recruitment.

The whiting stock has been subject to a series of very low recruitments in recent years (2003-7). During that period annual fishing mortality has been maintained at the low annual rate of 0.3, which has enabled a long term decline in biomass to be stabilised and subsequently reversed following improved recruitment. ICES has suggested converting the current fishing mortality rate into a long-term target.

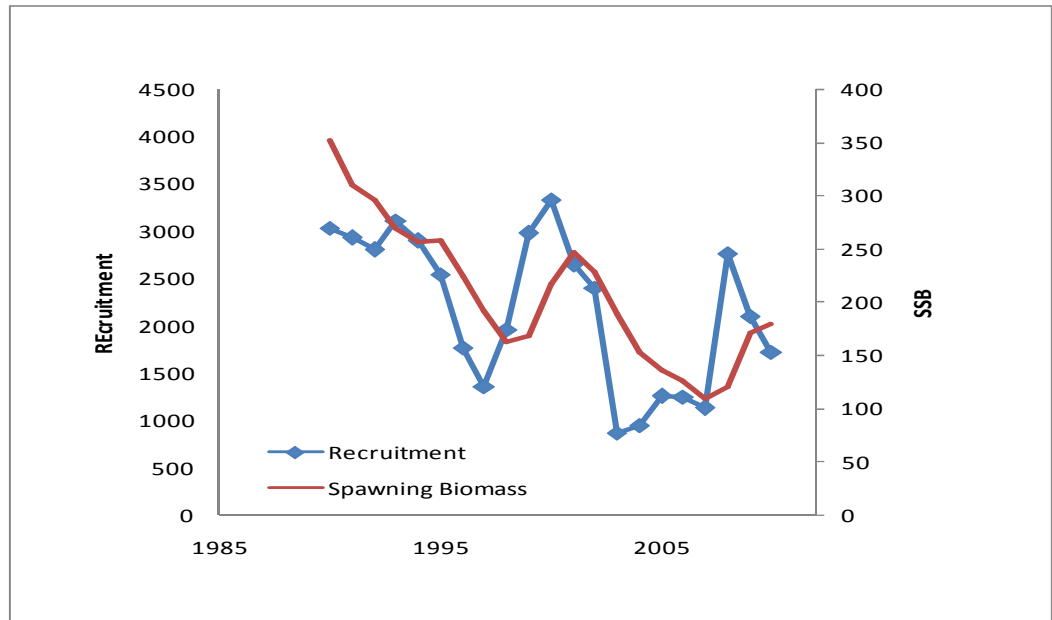


Figure x. Whiting in IV and VIId. Recruitment and spawning stock biomass trends from the ICES 2010 assessment.

An interim study presented at the EU-Norway negotiations during 2010 determined that fishing at an F of 0.3, with a 15% TAC constraint, would result in stable biomasses consistent with recent levels, as required by the ICES' advice. If recruitment remains at 2003-7 levels there is a low risk of the stock declining below the lowest values in the recent time series. On the basis of that study ICES was requested to provide advice as to the level to which fishing mortality should be reduced following a protracted period of low recruitment.

Task

The impact of a series of poor recruitments to the whiting stock will be conditional on five main factors that require evaluation in an extension of the interim simulations presented to the EU-Norway meetings. The dynamics of the stock and required management actions will be determined by:

- 1) The initial spawning stock biomass
- 2) The abundance of the recruitment
- 3) The number of consecutive low recruitment events
- 4) The level of fishing mortality
- 5) The TAC constraint

The simulation will use a similar stochastic simulation framework to that used in previous studies conducted by the STECF. It will project forward from a range of stock sizes and structures and evaluate the response of the stock to differing rates of reduction of fishing mortality below the target value of 0.3. Combination of the factors listed above will be used to test the potential response of the fishery and stock in response to simple rules related to the abundance and frequency of consecutive low recruitment.

Time line

The work will be detailed in an initial descriptive study that will be distributed to the members of the ICES WGNSSK for comment. The simulations will then be carried out in time to present the results to the WGNSSK 2011 meeting at ICES in 4-10 May. Dependent on the resulting evaluation by WKNSSK, if accepted or requiring only minor changes or additions a section will be appended to the WKNSSK report and passed to ADGNS / ACOM for advice. If more extensive further simulations are required a final report will be presented to the June ICES/STECF meeting for comment by f WKROUNDMP2011 and included in their report to ICES.

7 Next meeting WKROUNDMP2011/EWG 11-07

Location: Johann Heinrich von Thünen-Institut (vTI) Palmaille 9, 22767 Hamburg, Germany

Dates: 20-24 June

STECF meeting site for registration <https://stecf.jrc.ec.europa.eu/web/stecf/ewg07>

Draft terms of reference are given in Annex 3

Preliminary Agenda

Monday 1400 : 1800 - State of Reports confirmation of work etc. Coordination of presentations preparation of detailed agenda for Tuesday and Wednesday.

Tuesday

0900 1800 Baltic cod Impact Assessment and (Provisionally Southern Hake and *Nephrops* Impact Assessment) Agreement on main issues

Wednesday

0900 1800 Evaluation of cod plans for Kattegat, North Sea, West of Scotland and Irish Sea. Agreement on main conclusions

Thursdays

Plenary review of text

Friday 0900 1500

Plenary agreeing text for conclusions.

Annex 1: List of participants

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Annex 2: Agenda

- 1) Monday Afternoon
 - Contents of Impact Assessment and Evaluation reports Norwegian request for NS Cod and whiting; Any outstanding issues for Bay of Biscay sole simulations; Task allocation for individuals or groups:
- 2) Tuesday morning
 - Work in subgroups draft proposals for work
 - identifying timetables
 - data needs and available resources (draft text describing work for report) and preliminary work required to bring out (cod and whiting) stock modelling issues
- 3) Tuesday Afternoon
 - Presentation of main work on Bay of Biscay sole Impact Assessment
 - Definition of any additional work; Preliminary selection of main options for the final Impact Assessment; Report writing allocation
- 4) Wednesday Morning
 - Scoping Baltic cod Impact Assessment;
 - Objectives for Baltic Cod Multi Annual Plan; Agreement on what is needed to consider options; proposed work for Impact Assessment balancing needs and resources; data needs parameterisation and minimum scenarios and options where required in particular agreeing economic data requirement and the basis for Baltic cod stock simulations. Agreeing timetable and work exchange as required.
- 5) Wednesday Afternoon
 - Scoping four cod plan Evaluations
 - Defining period to be evaluated; Defining any specific industry questions; Work proposals to answer Evaluation questions; Defining data needs
 - methods and parameterization where needed; (medium term simulations and 'no plan' option); methods and graphical presentation can be shared to improve standardisation and reduce workload. Agreeing Timetables for any information exchange.
 - Agreement of Dates and location of next meeting
- 6) Thursday morning
 - finalizing any outstanding issues for 4 cod plans
 - Whiting requirements; model parameterisation
 - Reporting ICES / STECF Norway EU
 - and where whiting work should be presented presentation of any final issues for Bay of Biscay sole
- 7) Thursday Afternoon
 - Report sections (including work timetables)
- 8) Friday to 1500
 - Report sections (including work timetables)

Annex 3: WKROUNDMP2011 Draft terms of reference for the next meeting

The Workshop on Management plans Pt 2 (ICES - WKROUNDMP2011 STECF – EWG 11-07)

Chaired by John Simmonds

Italy

Will meet at VTI, Hamburg, Germany

20–24 June 2011 to:

a) provide an Impact Assessment report for

Baltic Cod

Southern hake, anglerfish and *Nephrops*

A separate report to be provided for each group

b) provide a single combined Evaluation report on cod plans for the following areas

Kattegat

North Sea

West of Scotland

Irish Sea

WKMPROUND2001/EWG 11-07 will provide a complete draft report by 1 July to the attention of the STECF and ACOM and a final draft by 6 July.

Supporting Information

Priority	Advice required in July
Scientific justification	TO answer specific request for advice to STECF and ICES
Resource requirements	MS scientists and STECF support
Participants	25 Experts, 20 managers and stakeholders
Secretariat facilities	None.
Financial	No financial implications for ICES
Linkages to advisory committees	Advice to STECF and ACOM
Linkages to other committees or groups	Links to Assessment WGs for Baltic, North Sea, Celtic Seas and Iberian.
Linkages to other organizations	The work is cooperation between ICES and STECF

Annex 4: Recommendations

There are no specific recommendations

Annex 5: Query tables on Baltic cod fishery

Table 1 Capacity in Baltic cod fishery

Country	Capacity ceiling (kW)*	Capacity used (kW)**
2005		
2006		
2007		
2008		
2009		
2010		

*Capacity Ceiling : according to article 10 CR 1098/2007

**kW used

Table 2 Fishing permits for cod

Country	No of permits granted	Number of active vessels by gear and area											
		Trawls*				Gillnetters**				Other Gears***			
		A	B	C	A+B+C	A	B	C	A+B+C	A	B	C	A+B+C
2005													
2006													
2007													
2008													
2009													
2010													

*Trawls: Trawls, Danish seines or similar gears of a mesh size equal to or larger than 90 mm

**Gillnetters: Gillnets, entangling nets or trammel nets of a mesh size equal to or larger than 90 mm

*** "Other gears" which should include bottom set lines, long-lines (except drifting lines), hand-lines and jigging equipment

Table 3.4. Effort quota and quota uptake for vessels < 8 m.

Country	Western Baltic		Eastern Baltic		Eastern + Western Baltic	
	Effort allowed	Quota used	Effort allowed	Quota used	Effort allowed	Quota used
2005						
2006						
2007						
2008						
2009						
2010						

