



European Commission
Directorate-General Fisheries
c/o Mr Fokion Fotiadis
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Date: 21 November 2007
Our reference: PRAC07.46/AC
Subject: Pelagic RAC recommendations on TACs 2008

Dear Mr Fotiadis,

The Pelagic RAC hereby presents you its unanimous recommendations on various pelagic stocks with regard to TACs for 2008.

The Pelagic RAC is concerned and disappointed that yet again the Commission is not able to take its viewpoints into consideration as the Coastal States negotiations on mackerel, blue whiting and Atlanto Scandian herring have taken place, and the Commission is already in the final stages of establishing the TACs for 2008, as evidenced at the joint RACs/ACFA meeting on the 13th November. A solution to this ongoing problem must be found otherwise the desired stakeholder policy input from Pelagic RAC as envisaged in establishing the RACs under the Common Fisheries Policy is redundant. In this regard, the Pelagic RAC is requesting a meeting early in the New Year to put in place a satisfactory mechanism for 2009 TACs so that the Pelagic RAC's recommendations can be fully taken into account by the Commission prior to the Coastal States meetings and to the issuing of its 2009 TACs proposals.

Nevertheless, the Pelagic RAC is still hopeful that the Commission will take on board these unanimous recommendations before issuing its TAC and quota proposals for 2008 particularly for those stocks that have not been agreed at the Coastal States meetings.

In accordance with article 18 of the articles of association of the Pelagic RAC, a copy of this letter has been sent to the Member States concerned and to the Advisory Committee on Fisheries and Aquaculture.

The Pelagic RAC looks forward to your response.

Yours sincerely,

A handwritten signature in black ink, appearing to be 'Aukje Coers', with a long horizontal stroke extending to the right.

Aukje Coers
Pelagic RAC secretariat

c.c. Mr Kenneth Patterson, Mr Penas-Lado, Mr Emmanouil Papaioannou, Mr Poul Degnbol, Mr Reinhard Priebe, Mr Konstantin Alexandrou

Atlanto Scandian Herring

This stock is in very good condition. ICES classifies the stock as having full reproductive capacity and being harvested sustainably. The estimate of the spawning stock biomass, although uncertain, is well above Bpa in 2007. Fishing mortality is well below Fpa. The initial ICES advice indicated more or less a roll over of the TAC in 2008 (1 266 000t or 1% reduction). However, as a consequence of a discussion in the Pelagic RAC Working Group in October with the chair of ACFM, ICES recalculated its advice on this stock and revised the advice upwards to a TAC in 2008 of 1 518 000t.

The Pelagic RAC recommends that:

- TAC for 2008 should be set at 1 472 000 tons, which constitutes an increase of 15% compared to the TAC in 2007
- The existing management plan should be adapted to include:
 - Year-to-year flexibility of +/- 10% with a maximum of two years;
 - A restraint on TAC fluctuations of +/- 15%.

The Pelagic RAC has taken note that the TAC for 2008 and a year-to-year flexibility have already been agreed between Coastal States.

North East Atlantic Mackerel

The ICES advise for this stock, in agreement with the management plan in place, is to allow for catches between 349 000 t and 456 000 t in 2008, which constitutes a reduction of between 9 and 30% in relation to last year. ICES classifies the stock as being harvested unsustainably, based on most recent estimates of fishing mortality. Their analyses suggest an underestimation of catch by 60% or more over a period of at least 14 years up to 2001. The Pelagic RAC is of opinion that, regardless the suggested level of unaccounted mortality in that period, there is good reasons to believe that the current situation with regard to unaccounted catches is a much more positive one.

The Pelagic RAC recommends that:

- A study focus group under the auspices of the Pelagic RAC is established, to investigate the current situation of unaccounted mortality within the mackerel fishery and – if necessary – pro-actively address the issue, e.g. by implementing a comprehensive (not mandatory) observer scheme. Stakeholders within the Pelagic RAC, as well as fisheries scientists, would be involved in this process.
- Alternatives to the current Management Plan should be evaluated, e.g. a plan incorporating a fixed TAC, and/or the present management plan should be reviewed to include:
 - A specification on the actual implementation of rapid recovery;
 - Clarification and prioritisation of the different decision rules;
 - Year-to-year flexibility of +/- 10% with a maximum of two years;
 - A restraint on TAC fluctuations of +/- 15%.
- A management plan should be developed for the North Sea component.
- The TAC for 2008 should be set at 502 000 tons (status quo).

Taking account of 18 000 tons that UK and Ireland have agreed not to fish, this would result in landings of 484 000 tons, effectively resulting in an $F = 0.21$, and an expected SSB in 2009 of 2.269 million tons¹. If compared to numbers in 2007 ($F = 0.2272$; SSB = 2.231 million tons), this implies that the two criteria:

"... the TAC will in no case be set at a level that will lead to an increase in fishing mortality nor to a decrease in spawning biomass, even if this means a bigger reduction in the TAC than 15%..."

in the policy statement of the Commission are met.

The Pelagic RAC has taken note that the TAC for 2008 has already been agreed between Coastal States.

Herring VIa North

Following a request of the Pelagic RAC, a focus group reviewed the existing VIaN herring management plan and drafted a proposal for amendments to the plan. The amended plan put forward (Annex A) includes changes to the harvest control rules and proposes an exploratory MIK net surveys by FRS Marine Laboratory to be carried out in VIaN during 2008 and 2009. These surveys aim at determining the feasibility and efficacy of the method to provide a recruitment index for West of Scotland herring, with a view to reducing the uncertainty of the stock assessment. Furthermore, the Pelagic RAC felt that it was very important that the plan would reasonably deal with the transition of moving from no agreed management arrangements to the implementation of a long-term management plan, in order to avoid a year-to-year TAC change of too large a magnitude, since there is a definite need for catch stability with the industry.

The Pelagic RAC recommends that:

- The amended management plan (Annex A), which includes balanced transitional arrangements, is presented to ICES to be tested for scientific scrutiny.
- TAC(2008) = 27 200 tons (in accordance with the amended Management Plan).

North Sea Horse Mackerel (IIa and IV)

ICES advise states that the available information is inadequate to evaluate spawning stock or fishing mortality relative to risk, so the state of the stock is unknown.

In light of this advice the Pelagic RAC recommends that:

- The 2007 TAC (42,727 t) should be rolled over until the management, assessment & data issues are resolved.
- A Horse Mackerel Focus Group under the auspices of the Pelagic RAC and supported by scientists should be established to:
 - Develop management options;

¹ Interpolated from options table in ICES advice 2007, Book 9, p.40

- Consider how to improve the research;
- Consider by-catch issues in the horse mackerel fishery;
- Examine alignment between scientific assessment areas and management areas;
- Review egg survey coverage North Sea.

Western Horse Mackerel zone Vb (EC waters), VI, VII, VIIIa,b,d,e, XII, XIV

As a result of a joint effort between the Pelagic RAC and a number of scientists, the Pelagic RAC presented to the Commission a management plan for western horse mackerel together with the request to ask ICES to evaluate this plan. In October 2007, ICES recommended *"a TAC of 180 000t in 2008, 2009, and 2010, indicated by the evaluation of the proposed management plan as being in accordance with the precautionary approach"*².

The Pelagic RAC wishes to express its satisfaction about the positive reception of the proposed management plan by ICES. However, the Pelagic RAC regrets the fact that the ICES advice was not followed up by the European Commission in the presentation of the Commission's initial thoughts on next year's TACs during a joint ACFA/RAC meeting in Brussels on 13 November.

The Pelagic RAC recommends that:

- The Commission implements the new three year management plan approved by ICES including the planned review in 2009.
- Set a three year TAC commencing 2008 at 170,000 t per year for zone Vb (EC waters), VI, VII, VIIIa,b,d,e, XII, XIV (An allocation of 10,000 tonnes has been included for Area VIIIc covered in Southern area recommendation below);
- The Commission should ensure that Member States should fulfil their obligations under the data directive regarding the provision of catch-at-age data;
- The Horse Mackerel Focus Group (established as proposed above) should work on alignment of management areas with scientific assessment areas including North Sea & Southern areas.

Southern Horse Mackerel (VIIIc and IX)

ICES advice states, in the absence of a reliable assessment and precautionary reference points, that the state of the stock cannot be evaluated. The Southern horse mackerel includes area VIII c which is scientifically assessed as part of the Western horse mackerel.

The Pelagic RAC recommends that:

- The TAC for 2008 should be 65,000 tonnes including 10,000 tonnes from Western horse mackerel to take into account that area VIIIc is part of the Southern horse mackerel quota management area.

² ICES advice 2007, Book 9, p53

- The Horse Mackerel Focus Group (established as proposed above) should:
 - Develop management options for this area;
 - Consider how to improve the data collection, particularly resolving the issue of apparent inconsistency between survey and catch at age data;
 - Examine alignment between scientific assessment areas and management areas focussing on the Western area.

Blue Whiting Combined Stock

Since the Coastal States have already set a catch limitation of 1 150 514t, the Pelagic RAC does not deem it relevant to provide a TAC advice for this stock.

However, the Pelagic RAC wishes to make to following non-TAC recommendations:

- The timing of the Coastal State meeting should be changed in future to allow the RAC time to comment on the scientific advice and make recommendations.
- The Pelagic RAC requests to have an ad-hoc arrangement in place in autumn 2008, to allow sufficient time to make its recommendation to the Commission prior to the Coastal States meeting.
- Measures should be adopted to protect juvenile blue whiting.
- Pelagic RAC research issues as outlined in earlier correspondence with the Coastal States in July 2007 (copy attached, see Annex B), such as the investigation into the different blue whiting stock components, should be pursued.
- Alternative management models should be developed under the Coastal States arrangement.
- A TAC constraint of +/- 15% and a year-to-year flexibility of +/-10% with a maximum of 2 years.

Annex A - Long term management plan for Herring VIa North

DRAFT Long-term Plan for the management of the stock of Herring to the West of Scotland (Northern part of ICES Division VIa)

Introduction

In response to conclusions of the Council for Agriculture and Fisheries of December 2005, the Commission set out its thinking concerning the operational elements of a management plan for West of Scotland herring in June 2006. The Pelagic RAC offered conditional support for the plan; however the plan was never put forward for adoption.

There is renewed impetus for the introduction of long-term management arrangements for this stock following the issue of the most recent scientific advice.

It is important that any management plan takes into account both the biological status of the stock and the socio-economic aspects of the fishery. Bearing in mind that the 2006 re-issued ICES advice was for a rollover of the TAC at 34,000t and that the 2007 ICES advice is for a TAC of 15,000t, it is important that the plan is adapted to reasonably deal with the transition of moving from no agreed management arrangements to the implementation of a long-term management plan. There is a definite need for catch stability to be brought into the equation here.

Running alongside this proposed plan is an initiative to improve the data on which the West of Scotland herring assessment is conducted (see appendix A). In this regard, Fisheries Research Services, Aberdeen, intends to undertake an exploratory Methot Isaacs-Kidd (MIK) net survey in 2008 and 2009 to determine the feasibility and efficacy of this method to provide a recruitment index for West of Scotland herring. This is a method which works successfully in relation to North Sea herring and would provide a much needed second fishery independent index for the West of Scotland herring in its annual assessment.

Scope

The long-term arrangement covers the quota and associated conditions for herring caught in EC waters of ICES Divisions Vb, VIa (North of 56°00' N and in that part of VIa which is situated east of 07°00' W and North of 55° 00'N, excluding the Clyde) and VIb.

Long-term objective

The long-term objective should be to exploit the stock at an average fishing mortality rate of $F = 0.25$ (average on ages 3 to 6).

Harvest rule

The TAC should be set each year according to the following rule:

1. Rules a.- c. apply in those years when ICES and STECF can provide estimates of spawning stock size and can calculate a forecast catch corresponding to specific fishing mortalities.

Annex A - Long term management plan for Herring V1a North

a. When the spawning biomass is equal to or greater than 75,000t:

- the TAC for the forthcoming year will be set to that value of catch corresponding to a fishing mortality of 0.25. Notwithstanding this, the TAC will not be set either more than 15% greater than the TAC applicable in the current year and will not be set less than 15% less than the TAC applicable in the current year.

b. When the spawning biomass is less than 75,000t but equal to or greater than 50,000t:

- the TAC for the forthcoming year will be set to that value of catch corresponding to a fishing mortality of 0.2. Notwithstanding this, the TAC will not be set either more than 20% greater than the TAC applicable in the current year and will not be set less than 20% less than the TAC applicable in the current year.

c. When the spawning biomass is less than 50,000t:

- a rebuilding plan will be put in place taking full account of fishing mortality and a mechanism established for rapid recovery of the SSB to above 50,000t.

(NB: the latest estimate of the spawning biomass is 66,510t).

2. In those years when ICES and STECF cannot provide estimates of spawning stock size nor calculate a forecast catch corresponding to specific fishing mortalities, rules d. and e. shall apply.

d. In the first year in which a scientific forecast is not available:

- the TAC shall remain unchanged from that applicable in the previous year.

e. In the second and for each subsequent year in which a scientific forecast is not available:

- the TAC shall be reduced by 10% compared to that applicable in the previous year.

(NB: rules d. and e. are included to be consistent with the precautionary approach to fish less when conditions are more uncertain).

Effort management

This long-term plan does not include effort management measures. These are not appropriate in a pelagic fishery.

Quota Flexibility

An inter-annual flexibility of up to 10% on national quotas would apply.

West of Scotland closed area for herring fishing

This closed area would be removed.

Annex A - Long term management plan for Herring VIa North

Control and inspection issues

Misreporting of herring caught in the North Sea as being caught in the area West of Scotland should be avoided. Specific control and inspection measures as follows are required:

- a. Vessels fishing for herring in Division VI a N, shall hold a special fishing permit (according to Article 7 of Regulation (EC) No 1627/94), and shall not be permitted to fish herring in other sea areas during the same fishing trip.
- b. This requirement shall not apply to vessels which use electronic log-books (i.e. transmit their catch report on a daily basis to the Fisheries Monitoring centre of the flag Member State, provided for in Article 3(7) of Regulation (EEC) No 2847/93, for inclusion in its computerised data base).
- c. Each Member State shall establish and maintain a list of vessels holding the special permit referred to in paragraph 1 and make it available on its official website to the Commission and other Member States. The vessels to which the provisions of paragraph 2 apply shall be clearly identified on the list.
- d. Member States shall carry out administrative cross-checks on all landings between the area of catch recorded in the logbook and catch reports submitted in accordance with the electronic logbook and VMS data. Such cross-checks shall be made available to the Commission on request.

Follow-up

DG FISH will review the entire long-term management arrangement four years after the entry into force of the regulation on the basis of STECF advice and propose any appropriate modifications.

SPFA

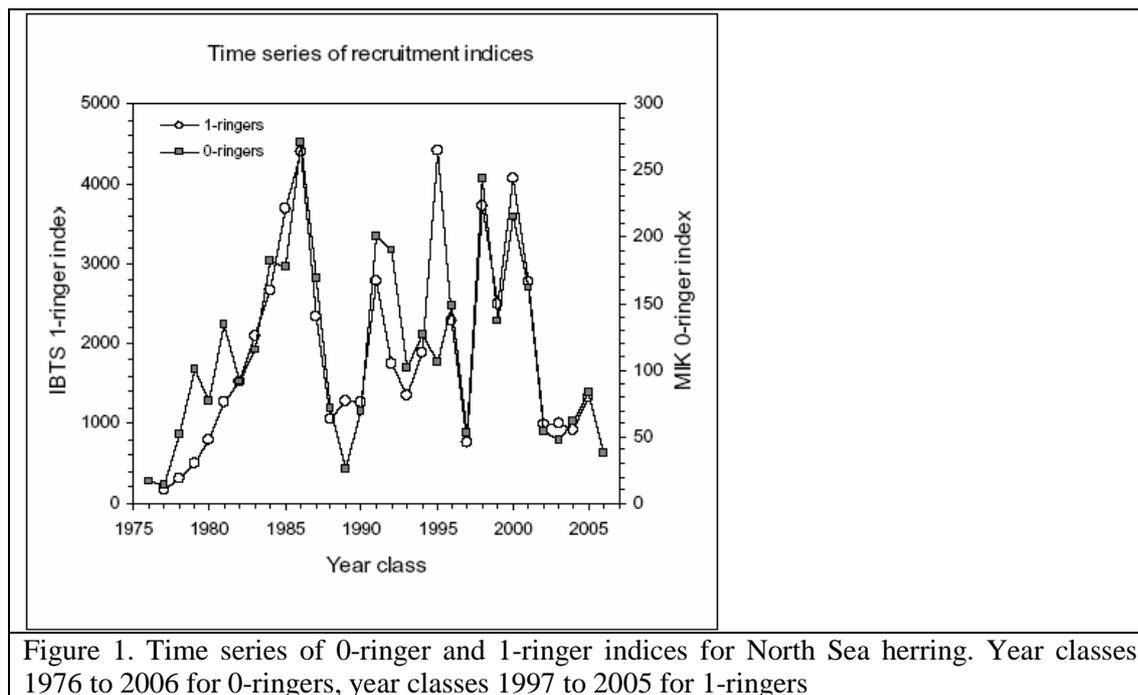
22 October 2007

West of Scotland herring (VIa North)

Improving the fishery independent information on which the assessment is based

MIK (Methot Isaacs-Kidd) surveys for late stage herring larvae

The International Bottom Trawl Survey (IBTS) in the North Sea started out as a young herring fish survey in 1966 with the objective of obtaining annual recruitment indices (abundance of 1-ringers in the 1st quarter) for the combined North Sea herring stock. It has been carried out every year since, and presently the survey provides recruitment indices not only for herring, but for roundfish species as well. During night-time on the IBTS 1st quarter, additional sampling of herring larvae (0-ringers) is carried out by small, fine-meshed nets. From 1977 to 1991 the gear was a small mid-water trawl (IKMT), but due to poor catchability of this gear, the standard gear was changed to a 2 metre ring net (MIK), used since the 1991 sampling. The total abundance of herring larvae in the survey area is used as an estimate of 0-ringer abundance of the stock. The 0-ringer index provides a very strong signal of year class strength, as seen below (Figure 1) by the strong correspondence between 0- and 1-ringer indices.



There is currently a quarter 1 IBTS survey to the west of Scotland but no MIK net survey is carried out during this survey. The VIaN stock lacks a recruitment index, with the only fishery independent information in the assessment coming from the acoustic survey, and that only for adults, aged 2+ (see below). The acoustic survey does not encounter recruits, or even juveniles, to enable a recruitment index to be developed.

There are issues with the entrainment of herring larvae from the VIa(N) stock into the North Sea as passive drift in the prevailing current. There are similar issues of drift of VIa(S) herring into VIa(N). However, it may be that a MIK net survey would provide a reasonable

Annex A - Long term management plan for Herring VIa North

index of recruitment as it does in the North Sea. The herring stock in the area is predominantly composed of autumn spawners (as in the North Sea) and a quarter 1 MIK net survey would be able to catch over-wintered 0-ringers and thus give a recruitment index.

FRS therefore intends to carry out an exploratory MIK net survey, hopefully in both 2008 and 2009, to determine the feasibility and efficacy of this method to provide a recruitment index for VIa(N) herring. This would then provide a much needed second fishery independent index for this stock in its annual assessment.

West of Scotland (VIaN) Acoustic survey

The principal type of fishery independent data used to obtain abundance indices for adult herring are derived from acoustic surveys. Fisheries Research Services carries out acoustic surveys for two herring stocks: west of Scotland herring (ICES Division VIaN); and North Sea herring (ICES Division IV). Both stocks are surveyed at the same time of year (July) and because of the wide offshore distribution of the stocks, large vessels (capable of pelagic trawling) are required to conduct the surveys. FRS has only one large vessel appropriate for the task, the FRV *Scotia*: this is used to survey the North Sea stock. The west of Scotland herring stock is, therefore, surveyed using a commercial vessel, chartered from the local pelagic fishing fleet.

FRS has carried out regular acoustic surveys for herring on the west coast of Scotland each year since 1991. These have formed part of the ICES International North Sea herring acoustic survey (INSHAS) which takes place each year with the participation of the United Kingdom (Scotland), the Netherlands, Norway, Germany, Denmark and, occasionally, Sweden and the Republic of Ireland. The INSHAS covers the whole of the North Sea and the west coast of Scotland. The west of Scotland survey is unique in being the only one which is carried out by a chartered commercial vessel. It is also unique in providing the ONLY fisheries independent data for this fishery. This contrasts with the North Sea survey estimate, which is used in conjunction with indices from larval, MIK and bottom trawl surveys.

The aim of the west of Scotland acoustic survey is to provide an age disaggregated abundance index and associated biological parameters (specifically: mean weights at age in the stock and maturity ogive) for the west of Scotland herring stock (ICES Division VIaN). The surveys are carried out in the month of July and cover the area north and west of Scotland from longitude 4° West to the shelf edge (200 m), as far south as latitude 56° North. The survey design (e.g. Fig. 1) is stratified according to the expected herring distribution based on the results from the survey time series. Regular parallel transects are used along lines of latitude. The transect spacing is set at 15, 7.5 or 3.75 n.mi., giving 2, 4 or 8 transects per ICES statistical rectangle respectively. Transect length is variable to extend from close inshore to the shelf edge (200 m). The total cruise track length is of the order of 2500 n.mi. (4630 km) for a survey of approximately 20 days. Any additional effort in the same area is unlikely to be very beneficial as the survey intensity (transect spacing) is already rather good, particularly in comparison to other surveys in the North Sea.

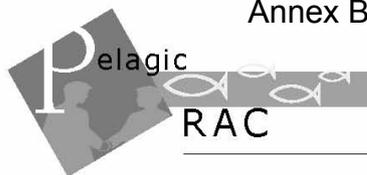
Whilst every effort has been made to cover the whole distribution, this may not always be possible. The survey area is well bounded to the east and west by the coast and the shelf break respectively. However, there are open borders to the south (south of 56°N) and to the east of 4°W north of Scotland. The first of these appears relatively secure, as fish

Annex A - Long term management plan for Herring VIa North

concentrations south of 56°30'N are relatively small (Fig. 5-7). Movement of fish across the 4°W line is much more likely. In some years there are large concentrations close to this line to both east and west. The 4°W line represents the border between ICES divisions VIa(N) and IVa, which are separate management units, but not clearly separate biological units. The stock in IVa is much larger than that in VIa so movements between the two areas would be expected to have a small influence on the abundance estimate in the North Sea, but a relatively much larger impact in VIa.

There are concerns as to the precision of the survey. Large oscillations in year to year estimates of biomass have been recorded and there are often estimates of a year class in one year which are higher than those of the previous year. There is no evidence to suggest that the precision is affected by the [commercial] vessel used. On three occasions, the survey has been carried out by the same vessel in consecutive years (1992 and 1993 by MFV Azalea; 1994 and 1995 by MFV Kings Cross; and 1999 and 2000 by MFV Christina S). Large fluctuations of biomass occurred between the years sampled by the same vessel in the same way that they occurred between different vessels. The imprecision is almost certainly driven by the year to year variability in the distribution of the stock. As an example, the concentrations off Barra Head may comprise a large fraction in one year (e.g. 2000) and be significantly less in an adjacent year (e.g. 1999). Stratification of effort, sampling those areas of highest variability more intensely may help reduce overall survey variability but given the variation between years is not expected to be a complete solution. Probably much more important is the potential for movements into and out of the area. The potential for significant numbers of fish to cross the 4°W line from the northern North Sea is considerable. If one considers the distributions in 1995, 1997 and 2002, there are obviously large numbers of “west coast” fish very close to the border. In this respect there is little that can be done to the survey to improve the situation, but in terms of the southern boundary, involvement of the Irish and Northern Irish may be beneficial. The latter is being considered by the ICES Planning Group for Herring Surveys at its next meeting in 2008.

Annex B - Letter to coastal states on blue whiting



Ministry of Fisheries
Coastal State A, B, C,

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Date: 23 July 2007
Our reference: PRAC07.20/IH
Subject: Pelagic RAC recommendations on blue whiting

Dear Mr, Ms,

The Regional Advisory Councils (RACs) were established as a result of the reform of the Common Fisheries Policy with the objective to ensure stakeholder involvement in the decision-making process. The Pelagic RAC prepares and provides advice on the management of pelagic fish stocks, i.e. blue whiting, herring, mackerel and horse mackerel on behalf of the fisheries sector and other stakeholders.

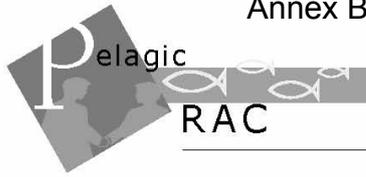
Over the past year, the Pelagic RAC has been in correspondence with the European Commission concerning certain aspects of the management of blue whiting. It has become clear to the RAC that a number of the issues it has raised need to be considered at Coastal State level and the RAC now wishes to make you aware of these issues and seeks your support.

a) Protection of juveniles

The Pelagic RAC is of the view that measures should be adopted to protect juvenile blue whiting. We are aware that ICES responded in 2003 to an Icelandic request on behalf of Iceland, Norway, the Faroe Islands, Greenland, Russia, and the EC to provide information on age/composition and to evaluate possible measures to reduce exploitation of juveniles in the blue whiting fishery (copy enclosed). In light of this response, the RAC considers that an action plan should be adopted to implement the recommendations in the ICES response.

b) Research

The Pelagic RAC advocates that, in order to improve understanding and inform the management process for blue whiting, ICES should be requested to:



Annex B - Letter to coastal states on blue whiting

- Consider more closely the different stock components. The European Commission has agreed that this issue should be investigated by ICES.
- Undertake an evaluation of the medium and long-term effects on stock size and fishing mortality of a constant TAC, including advice on the TAC and reference points to be used as trigger points for applying the TAC.

In addition, the Pelagic RAC requests that the following research questions be posed by the Coastal States to ICES:

- How can a more time sensitive recruitment index be established?
- Should the management plan for blue whiting provide for a different set of criteria depending on whether or not the stock is in a period of high or low recruitment?
- What constitutes high or low recruitment?
- Should a different set of harvest control rules be established?

The Pelagic RAC recognises that it has raised a number of difficult questions on a complicated subject. They are however, questions that the RAC feels must be addressed if the management of blue whiting is going to be optimised and we hope that you will support our attempts to gather all the necessary information to aid decision-making.

Accordingly, we would like to invite you to send a representative to our meetings to participate in the discussions. The next meetings are planned on September 3 (Working Group I on herring and mackerel) in Copenhagen and September 25 in Amsterdam (General Assembly and Executive Committee). We would be delighted if the Ministry would be represented at relevant meetings in the future.

Please liaise with the Pelagic RAC Secretariat regarding the meeting arrangements.

Yours sincerely,

Ingvild Harkes
Pelagic RAC

c.c. Mr Kenneth Patterson, Mr Constantin Alexandrou, Mr Emmanouil Papaioannou, Mr Poul Degnbol.

From ICES CRR 261 2003.

3.12.5.b Answer to Icelandic Request on behalf of Iceland, EC, Norway, Faroe Islands, Greenland, Faroe Islands and Russia to provide information on age/size composition and to evaluate possible measures to reduce exploitation of juveniles in the Blue Whiting Fishery

ICES is requested to provide as detailed information as possible on the age/size composition in different segments of the blue whiting fishery and to evaluate the effect on the stock and the fisheries of possible measures to reduce exploitation of juveniles. The evaluation should include but not be restricted to the effects of introducing a minimum size and closed areas/seasons. Continue the evaluation of candidates of harvest control rules.

ICES responds as follows:

The removals of immature fish in 2002 represented between 10-15% of the population of age 1 and 2 immature fish. The proportion of the population of age 0 fish (which are all immature) removed in 2002 is unknown but is believed to be small (Table 3.12.5.a.6).

About 20% of the catch (by weight) of the directed blue whiting fisheries are immature fish. In both the mixed industrial fisheries in IIa and the North Sea and in the bottom trawl fishery in VIIIc and IXa about 50% of the catch by weight are immature fish. However, the catch of immature fish from these fisheries represents only about 20% of the total weight of immature fish removed from the stock each year. About 80% of the total catch (by weight) of immature fish is taken in the directed blue whiting fisheries. Among the directed fisheries the

highest catches of age 1 and 2 fish are in IIa, Va, and Vb (Tables 3.12.5.a.7 and 3.12.5.a.8).

In 2002 Iceland introduced a measure to limit the number of immature fish taken in the fishery in Va, whereby if the catch comprises 30% or more fish smaller than 25 cm a temporary area closure is imposed. ICES considers this to be an effective measure to reduce directed fisheries for juveniles. ICES recommends that this measure be extended to other areas where significant numbers of juvenile fish are taken in the directed fisheries.

In general high exploitation rates on juvenile fish reduce the productivity of the population. A high exploitation rate of juveniles will accelerate the decrease in the blue whiting stock, which is expected in the longer term unless current high recruitment levels are sustained. Further work needs to be done to incorporate the different exploitation rates from the different fisheries into an overall harvest control rule. This should be done to limit the fishing mortality on juvenile fish in fisheries where more than 30% of the catch is immature.

The introduction of a minimum size limit may limit the directed fishery for juveniles but might also lead to increased discarding.