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Report of the Joint Scientific Council and Fisheries Commission
Working Group on Precautionary Approach

3-5 May 1999
San-Sebastian, Spain

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1. Opening

The Joint Scientific Council and Fisheries Commission Working Group on Precautionary Approach was called to order by H. P. Cornus at 1000 hr, 3 May 1999, at Miramon, Parque Tecnológico de San Sebastian, San Sebastian, Spain. Representatives from Canada, Denmark (in respect of the Faroe Islands and Greenland), Estonia, European Union, Iceland, Japan, Norway, Poland and the United States of America were present (Annex 1). The Chairman welcomed participants and expressed gratitude to the host Contracting Party (EU - Spain) for the invitation and excellent facilities.

The Chairman first outlined the history of the development of the Precautionary Approach (PA) at NAFO. In particular, the Scientific Council began discussions on the PA during its June 1997 Meeting. The Scientific Council Workshop in March 1998 followed by the Joint Fisheries Commission and Scientific Council Working Group Meeting in May 1998 resulted in recommendations at the Annual Meeting in 1998 to develop the Terms of Reference for this meeting. It was noted that some of the recommendations from that meeting had been addressed at earlier Scientific Council meetings, and outstanding items as given in the Report of the 27 April-1 May 1999 Meeting were addressed.

The Chairman reported that NAFO representatives, P. Gullestad (Chairman, Fisheries Commission) and H. P. Cornus (Chairman, Scientific Council), had intended to submit a proposal for standardization of PA terminology at international fora during the FAO, non-FAO Fishery Bodies and Agencies Meeting of 11-12 February 1999 at FAO Headquarters, Rome, Italy. However, the forum was found not suitable for the purpose. The WG noted that, as a follow-up to last year's recommendation, further more direct discussions among North Atlantic fisheries organizations and ICES will be more practical to develop standardizaion of concepts/nomenclature/abbreviations/definitions for the Precautionary Approach

The Chairman noted that P. Gullestad (Chairman, Fisheries Commission) was not able to attend this meeting and proposed that another co-chairman for this meeting be appointed from the Fisheries Commission to address items relevant to the Fisheries Commission. Canada accordingly proposed J. Baird (Canada), and the Working Group agreed to appoint him as Acting Co-chairman.

2. Appointment of Rapporteur

The Chairman proposed that T. Amaratunga, Assistant Executive Secretary, should act as the rapporteur for the general preparation of the report of this meeting, while individual rapporteurs will be appointed when addressing certain specific agenda items (e.g. Agenda items 5, 6, 7 and 8).

3. Adoption of Agenda

In considering the Provisional Agenda, the Working Group noted that some Contracting Parties had not received the letter of 5 March 1999 from the Executive Secretary (GF/99-187), presenting an amendment to the Provisional Agenda circulated on 4 March 1999 by the Executive Secretary (GF/99-183). The amendment was based on a proposal by Canada to insert a new item 5 (see Annex 2). The Working Group agreed to include Agenda item 5. Canada agreed to present a paper to relate to this item. The Agenda was accordingly **adopted**.

4. Review of the Recommendations of the Scientific Council Meeting (27 April-1 May 1999)

Results described in the Report of the Scientific Council Meeting on Precautionary Approach, 27 April-1 May 1999, were presented to the Working Group. It was noted the recommendations in relation to each of the three case study stocks would be discussed under agenda item 6, when the 3 stock models would be presented.

5. Identification of Management Measures as Part of a Comprehensive Application of the Precautionary Approach

The provisional framework for the application of the precautionary approach to fisheries management in the NAFO Regulatory Area recognizes the need to have limits not only on fishing mortality but also on biomass levels. This is consistent with the terms of the PA as reflected in the 1995 UN Agreement.

At the May 1998 meeting of the Working Group on the Precautionary Approach, it was agreed that, in addition to development and implementation of Harvest Control Rules and reference points, other management tools and concepts need to be identified to enable the wide application of the Precautionary Approach within NAFO. The Joint Scientific Council and Fisheries Commission Working Group recognizes that further work has to be carried out to improve the management tools that could accompany the implementation of a precautionary approach in the NAFO context but it is unclear which mechanism should be called upon to address these important questions.

The Working Group discussed potential management tools (a Canadian list of management tools is attached in Annex 3) and it is recognized that appropriate management measures should be identified to further the goal of precautionary management. This should be considered by the Fisheries Commission in September 1999.

6. Discussion of a Precautionary Approach, Including Precautionary Reference Points

The participants of the Joint Scientific Council and Fisheries Commission Working Group Meeting reviewed the analysis performed by the Scientific Council prepared during the meeting of 27 April-1 May 1999. It was pointed out that the terminology employed in scientific presentations related to the precautionary approach is rather difficult for the managers and clients. In addition, it was noted that the differences in the terminology employed in ICES and NAFO create some difficulty for the managers who have to work in more than one fisheries organization. The Chairman of the Scientific Council indicated that the NAFO PA Framework has been developed to address the peculiarities of the stock dynamics of fish stocks of the Northwest Atlantic. Some managers expressed the need for a clear, transparent and simple presentation of the results in order to understand the background.

1. Cod Stock in Divisions 3NO (stock with closed fishery)

The Scientific Council recommended to set the B_{lim} at 60 000 tons as the current best estimate for this case study. Scientific Council presented results of simulations on the development of the cod stock in Div. 3NO. All simulations assumed constant by-catch mortality, which was considered the most realistic situation. The development of the stock was simulated, and the probability of a year when SSB reaches B_{lim} and two buffers (16% probability to be below B_{lim} and 5% probability B_{lim} to be below B_{lim}) were presented based on the assumption of a normal recruitment regime. An additional simulation was presented based on the assumption that the stock is in a low recruitment regime.

The Scientific Council noted that the simulations are most sensitive to the choice of the stock recruitment relationship and explained the specific characteristic of this in the case of cod in Div. 3NO. After clarification of questions and a discussion the Working Group requested further simulations for the development of cod stock in Div. 3NO taking into account a possible lower B_{lim} due to probable current low recruitment regime and three different levels of by-catch mortality.

It was further requested to do the same exercise assuming a full range of observed recruitment. Scientific Council agreed to conduct this exercise during its June 1999 Meeting.

2. **Yellowtail Flounder Stock in Divisions 3LNO (stock with open fishery)**

The Scientific Council recommended to set F_{lim} at F_{MSY} as the current best estimate available for this case study. The Council noted that stock recruitment data for this stock were not considered reliable at this time and further investigations are needed and have to be reviewed at the Scientific Council June 1999 Meeting. Therefore, simulations like in the case of Div. 3NO cod could not be conducted. However, results of a production model were presented. These displayed the development of the yellowtail flounder stock in Div. 3LNO based on catches of 6 000 tons (equal to the 1999 TAC), 8 000 tons and 10 000 tons in the year 2000. In the following discussions the reason for using the production model for simulations were further evaluated. In addition, the Council explained why this model cannot provide estimates of B_{lim} and related buffers like in the case of cod in Div. 3NO. For illustrative purposes the development of this stock was presented in the context of the NAFO Scientific Council PA framework using a B_{lim} value indicated by other data sources. Following further clarifications and discussion, additional projections with the ASPIC model were requested including a scenario for F above and below F_{MSY} . Yields and biomass levels for long-term projections at $F = 0.1, 0.2$ and 0.3 were presented to allow evaluation of these different options and to illustrate the risks of falling below the critical levels.

3. **Shrimp Stock in Division 3M (stock for which only limited data are available)**

The “Traffic Light” framework and an illustrative application to shrimp in Div. 3M were presented to Working Group by Scientific Council. The framework was viewed, as an acceptable approach in relation to its potential for providing an understandable format for discussion and consensus building between scientists, managers and fishermen on resource status. It was concluded that, at this stage of development, the method can provide only short-term views of stock conditions rather than be used to evaluate future management options. Further investigations to improve the meaning of the “yellow” light are requested. It was noted that this method should be used only in addition to the traditional advice given by Scientific Council and not be considered as a replacement to it.

The Working Group concurred with Scientific Council’s recommendation that the use of the traffic light framework be considered by managers as an interim means to evaluate Div. 3M shrimp and other data-poor stocks.

7. Identification of Options for Decision-rules (management strategies) for the Three Stocks

See item 8.

8. Evaluation of Appropriate Management Strategies for the Three Stocks

After an initial discussion of these agenda items and recognizing the linkages between the two, the working group decided to include the summary of discussion as a single combined component of the report.

The initial discussion on these issues focused on the approach that the working group should take on this particular aspect of the agenda. There were two specific suggestions for proceeding:

1. Identification of management objectives with associated management strategies.
2. Determination of options for consideration by the Fisheries Commission.

There was no consensus as to which approach the working group should use, it was subsequently concluded that all elements to be included in a precautionary framework be simply listed without categorization for consideration by the Fisheries Commission and Scientific Council.

Cod in Divisions 3NO

The following list of elements was drawn from the discussion of the working group:

1. Restore and maintain stock at level that can support sustainable fisheries.
2. Rebuild SSB to a level that will increase the probability of good recruitment.
3. Keep directed fisheries closed in the short term.
4. Determine the spawning stock biomass at which the fishery will be re-opened.
5. Develop additional criteria to guide potential fishery re-openings.
6. Minimize the by-catch for cod in directed fisheries for other fisheries.
7. Identify and evaluate options for B_{lim} (60000 t SSB at high productivity level and 35000 t SSB at low productivity level). In doing so, use the following performance measures in the risk analysis:
 - ◆ The time (year) at which B_{lim} is reached at various probability levels
 - ◆ The yield potential at re -opening.
8. Evaluate risks of stocks being below B_{lim} .
9. Full review and analysis of 1) the stock recruitment data to determine the high and low productivity levels 2) options for B_{lim} and 3) the appropriate risk analysis.

Yellowtail Flounder in Divisions 3LNO

Additional analysis and options of 3LNO yellowtail flounder requested by the EU was presented. It was agreed that the format and content of this presentation would be useful to managers when considering precautionary approach management. The following list of elements regarding 3LNO yellowtail flounder was identified from the discussion:

1. Maintain harvest levels that will continue to rebuild and maintain the stock biomass above the rebuilt biomass level.
2. Continue with a comprehensive suite of management measures.
3. Ensure a conduct of the fishery in a manner that will not jeopardize recovery of other stocks in the area which are currently under moratorium, specifically 3NO cod and 3LNO American plaice.
4. Performance measures of interest to the managers could be expressed in terms of biomass and its trajectory and where it is with respect to the reference level and catch levels. With respect to catch, the performance measure was: cumulated yield, yield trajectories and trends (in particular, to identify declining trends).
5. It was noted that production models do not permit determination of all reference points. It should be ensured that data are available for scientists to move toward using age-structured modelling.
6. Despite these limitations, production modelling is a tool that could be used to start to evaluate real F limits and could be used to provide insight in what will happen if there are lower or higher fishing mortality levels.
7. There is a need to develop "target" biomass levels that could be higher than the biological limits so as to take into account management objectives including economic considerations.
8. Endorse the work of the Scientific Council in its attempts to develop a better understanding of the stock-recruit relationship.

Shrimp in Division 3M

The following items were identified by the working group as a possible approach to a data-poor stock situation, recognizing that this approach would need to be developed further:

1. The traffic light approach for shrimp is appropriate to assist managers in making short-term decisions but is currently not appropriate for determination of management strategies.
2. Further development of the traffic light approach would require interaction between managers and scientists.
3. The 3M shrimp traffic light table developed for this meeting is for descriptive purposes only and must not be used as a substitute for management advice because there is still a need to incorporate the managers views on certain elements of the approach.

4. Generally speaking, the traffic light approach could be appropriate for stocks for which the information is limited. This type of approach could be useful for managers in developing management decisions.
5. There is a need to separate in the formulation of a traffic light approach the measures of uncertainty in data and assessment and the measures of stock performance. Similarly, work should be done to develop proxies for reference points. There is concern that an extension of this approach to include separate measures of uncertainty and stock performance information will be useful only if these measurements are independent.
6. In order to improve our ability to assess the shrimp stock in 3M, data will have to be improved, including comprehensive surveys on the resource.
7. Decrease exploitation on males so that sufficient numbers have the opportunity to change sex and spawn at least once as females.
8. Ensure a suite of conservation and enforcement measures is maintained so as to adequately monitor this fishery.
9. Continue with mandatory use of sorting grates as defined in the Conservation and Enforcement Measures and continue to closely monitor by-catches in the fishery.

Conclusion

In conclusion, the working group recommends that both the Scientific Council and the Fisheries Commission consider the above in designing and formulating further action in respect to implementation of the PA for the above three stocks for the year 2000 and beyond.

In addition, as the implementation of the precautionary approach progresses, it is recommended that similar actions be taken for other stocks with related characteristics which are under the NAFO purview.

9. Others Matters

There were no other matters identified for discussion.

10. Adoption of Report

During the concluding session of the Working Group on 5 May 1999, the draft report was reviewed and the report was adopted.

11. Adjournment

Noting the Working Group work was brought to a successful completion, the Chairman, H. P. Cornus, thanked the participants, expressing his hopes that the work done so far on the PA will be continued to meet the management objectives. He extended special thanks to the AZTI hosts, particularly L. Motos for the arrangements, facilities and the great hospitality.

The Canadian representative on behalf of his delegation extended special thanks to the participants of the Working Group and expressed hope that work would continue to build on the progress so far on the precautionary approach. Thanks were also extended to the two co-chairmen for their excellent work, to the AZTI hosts for the great facilities and hospitality, and the Secretariat for the supporting work to make this a successful meeting. Similar appreciations were extended by the USA and the EU representatives.

There being no further business, the Chairman adjourned the meeting at 1335 hrs.

Annex 1. List of Participants

CANADA

Representatives

Robichaud, J. Dir. Gen., Resource Management, Fisheries Management, DFO, 200 Kent St., Ottawa K1A 0E6
Phone: +1-613-990-6794 – Fax: 1-613-954-1407

Advisers

Baird, J. W. Director, Resource Management, DFO, P.O. Box 5667, St. John's, Newfoundland A1C 5X1
Phone: +1-709-772-4497 – Fax: 1-709-772-3628 – E-mail: bairdj@dfo-mpo.gc.ca
Dussault, E. Director, Atlantic Affairs Div., International Directorate, DFO, 200 Kent St. Ottawa K1A 0E6
Phone: +1-613-993-5316 – Fax: +1-613-993-5995 – E-mail: dussaulte@dfo-mpo.gc.ca

DENMARK (in respect of Faroe Islands and Greenland)

Representatives

Lemche, E. Head of Representation, Greenland Home Rule, Denmark Office, Pilestræde 52, Box 2151, Copenhagen
Phone: +45 33 69 3400 – Fax: +45 33 69 3401
Kristiansen, A. Foroya Landsstyri, Fiskivinnudeildin, P. O. Box 64, FR-110 Torshavn, Faroe Islands
E-mail: andras@fisk.fl.fo

Adviser

Persson, J. Greenland Home Rule, Dept. of Industry, P. O. Box 269, DK-3900 Nuuk, Greenland
Phone: +299 34 53 24 – Fax: +299 32 47 04 – E-mail: jpe@dffl.gh.gl

ESTONIA

Representative

Aps, R. Deputy Director, Fisheries Dept. of the Ministry of Environment, Kopli 76, 10416 Tallinn
Phone: +37 2 660 3348 – Fax: +37 2 630 4080 – Email: aps@kopli.envir.ee

Adviser

Saat, T. Director, Estonian Marine Institute, 18b Viljandi road, EE-11216, Tallinn
Phone: +372 6 281 570 – Fax: +372 6 281 563 – E-mail: tsaat@sea.ee

EUROPEAN UNION (EU)

Representative

Wieland, F. European Commission, Directorate Gen. for Fish., Rue de la Loi 200, B-1049 Brussels, Belgium
Phone: +32 2 296 3205

Advisers

Hagstrom, O. European Commission, DG XIV – Unit C-1, , 200 Rue de la Loi, B-1049, Brussels, Belgium
Phone: +32 2 295 5612 – Fax: +32 2 296 6046 – E-mail: ulle.hagstroem@dg14.ccc.be
Svensson, L.E. Directorate General B-III Fisheries, Rue de la Loi, 175, B-1048 Brussels, Belgium
Phone: +32 2 285 7853 – Fax: +32 2 285 69 10
Feldthaus, S. Ministry of Food, Agriculture and Fisheries, Holbergsgade 2, 1057 Copenhagen K, Denmark
Phone: +45 33 92 35 60 – Fax: +45 33 11 82 71 – E-mail: sfe@fvm.dk

- Gauthiez, F. Ministère de l'Agriculture et de la Pêche, Direction de Pêches Maritimes, 3 Place Fontenoy, 75700 Paris 07 SP
Phone: +33(0) 1 49 55 8203 - Fax: +33 (0) 1 49 55 8200 –
E-mail: francois.gauthiez@agriculture.gouv.fr
- Pott, H. Bundesministerium für Ernährung, Landwirtschaft und Forsten, Rochusstr. 1, D-53125 Bonn, Germany
Phone: +49 40 228 529 4124 – Fax: +49 40 228 529 4410
- Salvador, S.S. Direcção Geral das Pescas & Aquacultura, Edifício Vasco da Gama, Alacantara Mar, Portugal
Phone: +3511 391 3520 – Fax: +3511 397 9790
- Ybañez, I. Subdir. Gen. de Organismos Multilaterales de Pesca, Jose Ortega y Gasset, 57, 28006 Madrid, Spain
Phone: +341 91 402 74 04 – Fax: +341 91 309 39 67 – E-mail: orgmul_sgpm@virtualsw.es
- Aro, M. Permanent Representation of Finland to the EU, Rue de Trèves 100, B-1040 Brussels, Belgium
Phone: +32-2-287-8464 – Fax: +32-2-287-8415 – E-mail: markku.aro@formin.fi
- Åkesson, R. Ministry of Agriculture, 10333 Stockholm, Sweden
Phone: +46 08 405 1122 – Fax: +46 08 10 5061 – E-mail: rolf.akesson@agriculture.ministry.se
- Cumberlidge, N. Ministry of Agric., Fish. & Food, Nobel House, 17 Smith Square, London, England SW1P 3HX
Phone: +44 71 238 5925 – Fax: +44 71 238 5721

ICELAND

Representative

- Skarphedinnson, K. Ministry of Fisheries, Skulagotu 4 – 18, 150 Reykjavik
Phone: +354-560-9670 – Fax: +354-562-1853 – E-mail: kristjan@hafro.is

JAPAN

Representatives

- Katsuyama, K. Deputy Director, Intl. Affairs, Div., Japan Fishery Agency, 1-2-1 Kasumigaseki, Chiyoda-ku, Tokyo 100-8907
Phone: +81 3 3591 1086 – Fax: +81 3 3502 0571
- Iwata, T. Inter. Affairs Div., Fisheries Agency, Government of Japan, 1-2-1 Kasumigaseki, Chiyoda-ku, Tokyo 100-8907
Phone: +81 3 3581 1086 – Fax: +81 3 3502 0571

Adviser

- Uozumi, Y. National Research Institute of Far Seas Fisheries, 5-7-1 Orido, Shimizu 424-8633
Phone: +81 543 36 6037 - Fax: +81 543 35 9642 - E-mail: uozumi@enyo.affrc.go.jp

NORWAY

Representative

- Sandberg, P. Directorate of Fisheries, P. O. Box 185, 5804 Bergen
Phone: +47 55 23 8000 – Fax: +47 55 23 8090 – E-mail: per.sandberg@fiskeridir.dep.telemax.no

Advisers

- Jakobsen, T. Institute of Marine Research, P. O. Box 1870 Nordnes, N-5817 Bergen
Phone: +011-47-5523- 8636 – Fax: +011-47-5523-8687 – E-mail: tore.jakobsen@imr.no
(or torej@imr.no)
- Johnsen, S.-A. Directorate of Fisheries, P. O. Box 185, 5804 Bergen
Phone: + 47 552 38000 – Fax: +47 552 38090

POLAND**Representative**

Dybiec, L. Min. of Transport & Maritime Econ., Sea Fish. Dept., Chalubinskeigo Str. 4/6, 00-928 Warsaw
Phone: +48 22 830 0262 – Fax: +48-2283-00947

UNITED STATES OF AMERICA (USA)**Representative**

Kurkul, P. National Marine Fisheries, Northeast Region, 1 Blackburn Drive, Gloucester, MA 20910
Phone: +978-281-9331 – Fax: +978-281-9315

Advisers

Rodrigues, K. National Marine Fisheries, 1 Blackburn Drive, Gloucester, MA 01930
Phone: +978-281-9324 – Fax: +978-281-9135 – E-mail: kathi.rodrigues@noaa.gov

SCIENTIFIC COUNCIL REPRESENTATIVES

H. P. Cornus, Chairman Scientific Council
W. B. Brodie, Vice-Chairman Scientific Council (Designated Expert for Div. 3LNO yellowtail flounder)
R. Mayo (Chairman STACFIS)
D. E. Stansbury (Designated Expert for Div. 3NO cod)
U. Skúladóttir (Designated Expert for Div. 3M shrimp)
D. B. Atkinson
D. Rivard
D. G. Parsons
H. Siegstad
E. de Cardenas
L. Motos
F. M. Serchuk

NAFO SECRETARIAT

T. Amaratunga, Assistant Executive Secretary
D. C. A. Auby, Secretary

SECRETARIAT ASSISTANCE

I. Martin, AZTI, Food & Fish., Tech., Inst., Satrustegi ib. 8, 20008 Donostia-San Sebastian, Basque Country, Spain
Phone: +34 943 316 731 – Fax: +34 943 212151 - E-mail: inma@rp.azti.es

Annex 2. Agenda

1. Opening by the Chairman
2. Appointment of Rapporteur
3. Adoption of Agenda
4. Review of the recommendations of the Scientific Council Meeting (27 April-01 May 1999)
5. Identification of management measures as part of a comprehensive application of the precautionary approach.
6. Discussion of a precautionary approach, including precautionary reference points, for three (3) model stocks:
 - a) Cod stock in Divisions 3NO (stock with closed fishery)
 - b) Yellowtail flounder stock in Divisions 3LNO (stock with open fishery)
 - c) Shrimp stock in Division 3M (stock for which only limited data are available)
7. Identification of options for decision-rules (management strategies) for the three stocks
8. Evaluation of appropriate management strategies for the three stocks
9. Other matters
10. Adoption of Report
11. Adjournment

Annex 3. Measures Proposed by Canada

Measures proposed by Canada to illustrate the use of other management measures to complement the application of the precautionary approach.

Canadian Management Measures that may be considered:
TAC/Moratorium
Limited Entry
Vessel Replacement Restrictions
Effort Control
Conservation Harvesting Plans
By-catch Protection Provisions
Minimum Fish Size
In-season Management
By-catch Protocols (In-season)
Small fish Protocols (In-season)
Spawning Closures
Juvenile Closures
By-catch Closures
Fishing Gear Restrictions – Minimum Mesh
Fishing Gear Restrictions – Separator Grates
Observers – Canadian Zone
Observers – NRA - % Coverage
Dockside Monitoring - % Coverage
Vessel Monitoring Systems
Air Patrols
Ship Patrols
On-board Inspections
Basic Scientific Surveys
Comprehensive Scientific Surveys