International Consultations on the Establishment of the
South Pacific Regional Fisheries Management Organisation

Seventh International Meeting

REPORT OF THE SCIENCE WORKING GROUP
Lima, Peru
12 May – 15 May 2009

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1. Welcome & Introductions

The 7th meeting of the SPRFMO Scientific Working Group was opened by the Chair, Andrew Penney of New Zealand.

2. Adoption of Agenda

The draft agenda (SP-7-SWG-01) was adopted without amendment.

3. Administrative Arrangements

3.1 Meeting documents

The Chair noted that four amended species profiles (for jack mackerel, orange roughy, alfonsinos and cardinalfish) were being tabled under agenda item 8.

Document SPRFMO-V-SWG-08 (Draft Guidelines for National Reports) from the 5th SWG meeting was being re-discussed under agenda item 9.

4. Nomination of Rapporteurs

The Chair agreed to rapporteur the meeting, with assistance from the interim Secretariat.

5. Inter-Sessional Work

5.1 Report from the Interim Secretariat on status of catch & effort data submission

It was noted that the Secretariat had tabled a draft update on data submitted to the interim Secretariat as of 5 May 2009 at the DIWG meeting. This had subsequently been

updated with additional information on total catch by vessel from Vanuatu, updates on total catch and bottom fishing footprint mapping from Chile and information on historical bottom fishery catches by species from the New Zealand bottom fishery assessment. These updates were incorporated into a working paper to the Negotiations.

The Secretariat was requested to prepare an additional table summarising details of numbers of vessels and GRT for vessels authorised to fish in the SPRFMO area in 2009.

5.2 Update by the Interim Secretariat on status of the SPRFMO bottom fishing footprint maps, and the SPRFMO GIS database

- Bottom Fishing Footprint Maps

Robin Allen, Executive Secretary, reported that bottom fishing footprint information had been received from New Zealand and Chile, in the form of maps, lists of coordinates and effort indices for the blocks constituting their respective bottom fishing footprints. Test pages are being developed for the display of such maps on the SPRFMO website.

The Chair reminded participants that they were required to submit individual bottom fishing tow or set data to the Secretariat, and that the Secretariat was responsible for preparing joint bottom fishing footprint maps using these data.

New Zealand reported that they would be submitting their individual tow data to the Secretariat for this purpose, and emphasised that official SPRFMO bottom fishing footprint maps should only be prepared from individual tow data submitted by participants, and not from maps without the underlying data. Such data will also be essential in efforts by the SWG to review proposals for alternate bottom fishing footprint mapping methods or resolutions, as part of the process to revise the draft SPRFMO Bottom Fishery Impact Assessment Standard.

- Secretariat GIS Software

The Executive Secretary reported on efforts underway to establish geospatial database and analysis facilities within the interim Secretariat. Software and training costs differ substantially between software systems and the Secretariat was awaiting a firm recommendation on the preferred GIS software.

USA, Australia, New Zealand and Chile reported that they all use ESRI ArcView® geospatial software. To ensure compatibility between geospatial data sets and analyses between participants and the Secretariat, the SWG recommended that the Secretariat obtain the necessary ArcView® software to develop the geospatial databases and conduct the required analyses already identified by the SWG. The Secretariat undertook

to prepare budget proposals for purchase of the various ArcView® software components for consideration by participants to the negotiations.

6. Report-Back from the Meeting of the Jack Mackerel Sub-Group

The Jack Mackerel Sub-Group met prior to the SWG meeting. The full report of the meeting is attached as Annex SWG-03.

The Jack Mackerel Sub-group considered the results of the assessment methods workshop and endorsed the two proposed activities: the comparison of age estimation protocols used by different laboratories, and the development and use of a simulated dataset to compare assessment models under the guidance of an Assessment Simulation Task Team.

It was proposed that the next meeting of the Jack Mackerel Sub-group review updated information on stock indicators as its main short term priority and use this as a basis for providing advice to the Scientific Working Group on the status of Chilean jack mackerel.

Further efforts to establish a Steering Committee for the Stock Structure Research Programme were urged, but it was noted that there were already ongoing and collaborative research using methods identified in the proposed programme.

Revisions to the Chilean jack mackerel profile were to be progressed by further inter-sessional exchanges.

In principle support was given for the collection of acoustic data from industry vessels using protocols developed by the ICES working group on fisheries acoustics.

There was support for holding only one formal meeting of the Jack Mackerel Sub-group each year.

There was a preference for the new chair of the Jack Mackerel Sub-group to come from a country with no major involvement in the fishery for Chilean jack mackerel.

7. Report Back from the Meeting of the Deepwater Sub-Group

The Deepwater Sub-Group met prior to the meeting of the SWG and the full report of the DWSG meeting is attached in Annex SWG- 04. In the continued absence of nominations for a Chair for this Sub-Group, the meeting was chaired by the Chair of the SWG. The main matters considered by the DWSG meeting were:

- The bottom fishery impact assessment submitted by New Zealand for their SPRFMO area bottom fishing activities in 2008 and 2009 was reviewed and commented on by participants. Specific answers were provided to the list of review questions identified at the 4th meeting of the SWG.

- The first draft of a proposed SPRFMO Bottom Fishery Impact Assessment Standard was tabled and discussed. Key concerns with the various sections of the draft were noted by participants, and suggestions made for improvements to each of the sections. A task team was established to address these concerns and suggestions during an inter-sessional process to revise the draft standards, with a view to preparing a revised draft for consideration at the next SWG meeting.

8. Species and Habitat Profiles

8.1 Review of new species or habitat profiles

No new species or habitat profiles were tabled for discussion.

8.2 Revisions to existing profiles

A revised jack mackerel species profile was tabled at the Jack Mackerel Sub-Group meeting, and proposed amendments to the species profiles for orange roughy, alfonsinos and cardinalfish were tabled at the SWG meeting.

Participants requested additional time to consider these proposed amendments inter-sessionally. It was agreed that a deadline of 1 August 2009 should be set for submission of all proposed amendments to these four profiles. Participants should submit proposed amendments with tracked changes to the Secretariat by this deadline.

Sandy Morison offered to initiate the exchange and collation of amendments on the jack mackerel profile, but would then pass these on to Alexander Glubokov, who would be responsible for finally collating all proposed amendments into a single, tracked changes draft revised jack mackerel profile, and forwarding this to the Secretariat for distribution. The Chair offered to assist the Secretariat with collation of proposed amendments to the three deepwater species profiles.

9. Guidelines for Annual National Reports to the SWG

9.1 Consideration of draft guidelines for annual National Reports to the SPRFMO SWG

The meeting considered the draft guidelines for preparation of annual national reports to the SWG by participants, that were initially tabled and discussed at the 5th SWG meeting in Guayaquil. Written comments and proposed amendments to these guidelines were received intersessionally from Peru and the EC.

It was confirmed that annual reports to the SWG were intended to be broad overviews of participant's fisheries, highlighting trends and recent changes that had occurred, and were not intended to be complex, or to include data submissions. Participants agreed

that such national reports to the SWG would be useful, and proposed a number of further amendments to the guidelines. Following incorporation of all amendments received inter-sessionally, or tabled at the meeting, the meeting adopted the amended guidelines (Annex SWG-05).

The SWG recommended that participants be required to prepare and submit annual reports in accordance with the adopted guidelines to future annual meetings of the SWG.

10. Review of Interim Science Processes & Requirements

The Chair noted that a number of questions had been submitted by New Zealand for consideration of the SWG regarding the frequency and purpose of meetings of the SWG and Sub-Groups. Ongoing problems with nominating Chairs for the Jack Mackerel and Deepwater Sub-Groups also raised questions about the value of retaining separate sub-groups for pelagic and deepwater species.

Participants confirmed that separate sub-groups should be retained, to allow specific emphasis to be placed on the issues of specific interest to participants in either the pelagic or deepwater fisheries.

With regard to frequency of meetings, participants agreed that the SWG and Sub-Groups should each meet only once a year. This would not preclude options for additional, smaller technical meetings to be held more frequently during inter-sessional periods.

Regarding cost considerations, participants expressed a preference for these meetings to be held consecutively, and immediately prior to a Negotiation meeting held in the 2nd half of the year. Meetings of the Deepwater Sub-Group should preferably precede meetings of the Jack Mackerel Sub-Group.

11. Future Scientific Work Programme

The following inter-sessional work programme items were identified for the SWG and Sub-Groups:

<u>Jack Mackerel Sub-Group</u>

- Preparation of analyses and papers on indicators for the jack mackerel fisheries, for review at the next meeting of the Jack Mackerel Sub-Group.
- Investigation and standardisation of otolith ageing protocols between jack mackerel fishery participants.
- Work by the jack mackerel Assessment Simulation Task Team to prepare simulated data for jack mackerel fisheries, and to evaluate alternate stock assessment models using these data.

- Progress research work under the Jack Mackerel Stock Structure Research Programme.

Deepwater Sub-Group

- Preparation by the Impact Assessment Standard Task Team of alternative texts for the various sections of the draft SPRFMO Bottom Fishery Impact Assessment Standard and preparation of an amended draft standard for consideration at the next meetings of the DWSG and SWG.
- Inter-sessional review of any bottom fishery impact assessments submitted by participants.
- Preparation of papers on deepwater species management approaches.

Scientific Working Group

- Submission of proposed amendments to the species profiles for jack mackerel, orange roughy, alfonsinos and cardinalfish by 1 August 2009.

12. SWG and Sub-Group Chairmanship

The SWG re-iterated the importance of appointing Chairs to the Jack Mackerel and Deepwater Sub-Groups.

Andrew Penney was reconfirmed as Chair of the SWG for the remainder of the interim period, with a maximum term of office of two years.

13. Other Matters

No other matters were discussed.

14. Adoption of SWG Report

The SWG Plenary Report was adopted after inclusion of edits proposed by participants.

15. Meeting Closure

The meeting was closed at 16h00 on Friday 15 May.

Annex SWG-01

AGENDAS FOR THE SCIENCE WORKING GROUP

and SUB-GROUPS

Lima, Peru, 12 - 15 May 2009

SCIENCE WORKING GROUP: PLENARY

AGENDA

The Plenary Meeting of the Science Working Group will review and comment on the reports of the Jack Mackerel and Deepwater Subgroups, deal with overall science issues that span across Sub-Groups, or have not been allocated to Sub-Groups, and will provide research and management advice to the Negotiations.

1. **Welcome & Introductions**

2. **Adoption of Agenda**

3. **Administrative Arrangements**
   - 3.1. Meeting documents.
   - 3.2. Meeting arrangements.

4. **Nomination of Rapporteurs**

5. **Inter-Sessional Work**
   - 5.1. Report from the Interim Secretariat on status of catch & effort data submission.
   - 5.2. Update by the Interim Secretariat on status of the SPRFMO bottom fishing footprint maps, and the SPRFMO GIS database.

6. **Report-Back from the Meeting of the Jack Mackerel Sub-Group**

   The Chair of the Jack Mackerel Sub-Group will report back on the key conclusions and recommendations of the meeting of the Jack Mackerel Sub-Group. The JMSG will provide a summary of these key results for inclusion in the SWG report under this agenda item. Where necessary, the SWG Plenary may add further comment from a Plenary perspective,

after review of the JMSG Report. In addition, the detailed report of the JMSG meeting will be appended to the SWG report in full.

7. Report Back from the Meeting of the Deepwater Sub-Group

The Chair of the Deepwater Sub-Group will report back on the key conclusions and recommendations of the meeting of the Deepwater Sub-Group. The DWSG will provide a summary of these key results for inclusion in the SWG report under this agenda item. Where necessary, the SWG Plenary may add further comment from a Plenary perspective, after review of the JMSG Report. In addition, the detailed report of the DWSG meeting will be appended to the SWG report in full.

8. Species and Habitat Profiles

8.1. Review of new species or habitat profiles.

8.2. Revisions to existing profiles.

9. Guidelines for Annual National Reports to the SWG

9.1. Consideration of draft guidelines for annual National Reports to the SPRFMO SWG.

Further consideration of the draft guidelines for annual National Reports to the SWG, initially tabled and discussed at SPRFMO5 SWG meeting in Guayaquil.

10. Review of Interim Science Processes & Requirements

The SWG has been asked to 'consider the future frequency, location and purpose of the Working Group meetings, and report back to the negotiations on their recommendations'. The SWG Chair therefore intends to table the following questions for discussion under this Agenda Item:

- *Should the SWG and Sub-Groups continue to meet at all until we have an adopted SPRFMO Convention and functioning SPRFMO in place?*
- *If the SWG and Sub-Groups should continue to meet during the interim period, how often should such meetings occur, where and when should they be held?*
- *What should be the primary purpose/s of any future SWG meetings in the interim period?*

11. Future Scientific Work Programme

11.1. Identification of short & medium term science requirements.

11.2. Identification of research and assessment matters to refer back to each of the SWG Sub-Groups.

12. **SWG and Sub-Group Chairmanship**

    Consideration of nominations for Chair of the SWG for the next term of office. Ratify nominations for the Chairs of the Jack Mackerel and Deepwater Sub-Groups.

13. **Other Matters**

14. **Adoption of SWG Report**

15. **Meeting Closure**

SCIENCE WORKING GROUP : JACK MACKEREL SUB-GROUP

AGENDA

In accordance with their interim terms of reference, the Jack Mackerel Sub-Group will deal with all matters related to research and assessment of jack mackerel, including related species caught in jack mackerel fisheries, and provide advice to the SWG Plenary on the status of the stocks, and evaluate conservation and management options, for jack mackerel in the SPRFMO area.

1. **Opening of the Meeting**

2. **Adoption of Agenda**

3. **Administrative Arrangements**
   - 3.1. Meeting documents.

4. **Nomination of Rapporteurs**

5. **Report on the Jack Mackerel Stock Assessment Workshop**

   The report from the recent workshop will be tabled for discussion and the results used in considering the next agenda item.

6. **Jack Mackerel Stock Assessment and Modelling Approaches**
   - 6.1. Data compilation, vetting and dissemination.
   - 6.2. Plan for development of agreed assessment models.
   - 6.3. Management Strategy evaluation.

7. **Jack Mackerel Stock Structure Research Programme**
   - 7.1. Update on funding.
   - 7.2. Establishment of a Jack Mackerel Research Programme Steering Committee.
   - 7.3. Identification of participants in the Research Programme.
   - 7.4. Revisions to Budget.
   - 7.5. Planning for protocols and methods workshop.
   - 7.6. Timetable of proposed research activities.

8. **Process for Provision of Advice to the Science Working Group on the Status of Jack Mackerel in 2009**

   Following the outcomes of the recent workshop, and the agreed approaches for future assessment work, the subgroup will discuss the process to be followed for the provision of advice on the status of jack mackerel this year.

9. Revisions to the Jack Mackerel Species Profile

The revised jack mackerel species profile will be discussed and a revised summary adopted.

10. Future Jack Mackerel Sub-Group work programme

10.1. Identification of short & medium term research and assessment requirements.

11. Chairmanship of the Jack Mackerel Sub-Group

Nominations for the future chairmanship of the JMSG to be discussed.

12. Other Matters

12.1. Proposal for collection of acoustic data from fishing vessels
12.2. Frequency, location and purpose of future Sub-group meetings

13. Adoption of Jack-Mackerel Sub-Group Report and Summary

In addition to preparation of a detailed JMSG Report for appending to the SWG Plenary Report, the JMSG will be required to prepare a summary of the key conclusions and recommendations of the meeting to insert into the SWG Plenary Report.

SCIENCE WORKING GROUP : DEEPWATER SUB-GROUP

AGENDA

In accordance with their interim terms of reference, the Deepwater Sub-Group will deal with all matters related to research and assessment of deepwater species caught in bottom fisheries, including ecologically related species, and provide advice to the SWG Plenary on the status of the stocks, and evaluate conservation and management options, for deepwater species in the SPRFMO area.

1. **Opening of the Meeting**

2. **Adoption of Agenda**

3. **Administrative Arrangements**
   3.1. Meeting documents.

4. **Nomination of Rapporteurs**

5. **Chairmanship of the Deepwater Sub-Group**

   Report back on any email exchanges or proposals for nominations for this position, and consider nominations for Chair of the Deepwater Sub-Group.

   It will be necessary to at least nominate a Chair for this meeting for the discussion of Agenda item 6: Review of the New Zealand Bottom Fishery Impact Assessment. The Chair of the SWG cannot Chair this discussion.

6. **Review of Bottom Fishery Impact Assessments**

   Review and comment on any benthic assessments that may have been submitted for proposed fisheries in the SPRFMO area, or discussion of questions which have arisen about these assessment requirements or process since SPRFMO5 in Guayaquil. Assessments will need to be reviewed against the standards in the SPRFMO Benthic Assessment Framework, and at least against the list of questions in Section 8 of the Report of SWG 4 (Noumea, September 2007).

   6.1. Review of the New Zealand Bottom Fishery Impact Assessment.
   6.2. Review of the Assessments Submitted by Other Participants.

7. **SPRFMO Benthic Assessment Standard**

Discussion and amendment of the draft SPRFMO Benthic Assessment Standard. Preparation of an amended draft standard for further inter-sessional consideration by participants.

8. Deepwater Species Assessment and Management

Discussion of any new papers submitted on options for assessment and management of low-productivity deepwater species.

9. Other Matters

10. Adoption of Deepwater Sub-Group Report and Summary

(In addition to preparation of a detailed DWSG Report for appending to the SWG Plenary Report, the DWSG will be required to prepare a summary of the key conclusions and recommendations of the meeting to insert into the SWG Plenary Report.)

Annex SWG-02

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Annex SWG-03

Report of the

Jack Mackerel Sub-group

12-15 May 2009

Lima, Peru

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1. Opening of the Meeting

The meeting was opened by the Chair, Mr Sandy Morison (Australia) who provided an overview of the main issues to be covered.

2. Adoption of Agenda

The Chair provided commentary on each of the proposed agenda items and documents relevant to an agenda item. Under Agenda Item 12 Other Matters it was proposed to discuss two items: a submission titled "Proposal for consideration of the Science Working Group (SWG) of SPRFMO" (SP-07-SWG-JM-03), and the future frequency, location and purpose of Jack Mackerel Sub-group meetings.

The Agenda was adopted.

3. Administrative Arrangements

The chair identified the documents relevant to each agenda items as the agenda was discussed. A list of documents from the meeting is provided as SP-07-SWG-02.

4. Nomination of Rapporteurs

Mr Ad Corten and Mr Rodolfo Serra agreed to act as rapporteurs for the meeting.

5. Report on the Jack Mackerel Stock Assessment Methods Workshop

The full report of the workshop is provided as Annex SWG-JM-01. The Chair provided an oral summary on the results of the 2009 Jack Mackerel Stock Assessment Methods Workshop held in the previous week and highlighted the key proposals and issues that would require discussion at the current meeting.

The Chair of the SWG expressed disappointment at the need to resort to proposing the use of simulated data to evaluate stock assessment models rather than real data. He noted, however, that

tow-by-tow data on the catches of jack mackerel had been supplied by the EC, Korea and the Cook Islands. He pointed out that the Interim Measures, to which all participants to the negotiations had agreed, required the collection and provision of data to the Interim Secretariat and that the plenary meeting in October 2008 had also agreed to the request for access to non-public domain data to facilitate the assessment of the status of jack mackerel.

Peru strongly supported the statement of the Chair of the SWG and also encouraged participants to submit their data to the Interim Secretariat according to the commitment adopted in the Interim Measures.

It was recognized that the sub-group will not be in a position to provide advice on the status of Chilean jack mackerel based on the results of an agreed joint assessment model in 2009.

6. Jack Mackerel Stock Assessment and Modelling Approaches

6.1. Data compilation, vetting and dissemination.

It was noted that the summary provided by the Interim Secretariat showed that the data provided by some countries was only at the level of an annual summary and not the detail needed for assessments.

The EU noted that they had provided tow-by-tow data, observer data and biological data to the Interim Secretariat.

Vanuatu reported that it expected to provide tow-by-tow data for 2008 to the Interim Secretariat by the end of June.

New Zealand also reported that it would be reporting its data as required.

6.2. Plan for development of agreed assessment models.

The Chair noted that the Stock Assessment Methods Workshop had proposed a process to evaluate the performance of assessment models using a simulated dataset. This process was to be run under the guidance of an Assessment Simulation Task Team. It was suggested that this proposed process had a high likelihood of coming up with an agreed assessment approach but that it is was important that the simulated dataset be representative of the actual data from the Chilean jack mackerel fishery.

It was proposed that the results of the evaluation of alternate models using simulated data should be discussed at a meeting of the Jack Mackerel Sub-group one week before the next meeting of the SWG. If this next meeting took place in October 2009 it was suggested that the simulated dataset needed to be developed and exchanged by the end of July, and that the initial assessment outputs using this dataset needed to be obtained and reported by the end of September.

The position of the head of the Assessment Simulation Task Team was identified as an important role. After further consultations Mr Ad Corten was nominated and agreed to take the role of the head of this Task Team.

6.3. Management Strategy Evaluation.

It was acknowledged that the use of Management Strategy Evaluation was likely to be important in the future but that it was not feasible at this stage given that there were no agreed assessment approaches that could form the basis of an operating model and no agreed performance indicators that would allow options to be assessed.

7. Jack Mackerel Stock Structure Research Programme

The Interim Secretariat reported that there had been no nominations for the proposed Steering Committee to oversee this proposed research programme. The Chair requested that the Interim Secretariat write to all participants and invite a nomination of a representative to sit on that Steering Committee. It was noted that at the meeting in Canberra in 2008 Chile, China, Cuba, EU, Peru and Russia had agreed to be part of that Steering Committee whose functions were agreed at that meeting.

It was noted that it was important for research activities to be coordinated and collaborative and that the Steering Committee could possibly help in securing cooperation and funding from international sources. It was also noted that there needed to be a leader selected for this committee. The Chair suggested that once the committee was established that it could select a leader from among its members.

In the absence of a Steering Committee there had been no progress on implementing this co-ordinated approach to the issue of stock structure, but several countries reported that they had undertaken research that was relevant to the issue. It was agreed that bilateral and multilateral cooperation on such research should continue while the research plan is in development.

It was reported that Russia was undertaking genetic work to identify stocks in collaboration with Korea. Chile offered to assist in this by providing the results of some of its work which had identified suitable genetic markers. A copy of the paper describing this work on polynucleotide markers for Chilean jack mackerel which have been developed was provided to the meeting (SP-07-SWG-INF-10). It was also reported that China was engaged in some genetic analyses.

Chile reported that it was already undertaking a study on stock structure that involved most of agreed aspects of the Stock Structure Research Programme including genetics, morphometrics, otolith microchemistry and parasites. This work also involved collaboration with other participants in the provision of samples.

It was agreed to discuss the relative importance of the Stock Structure Research Programme along with other proposed research activities under Agenda Item 10.

8. Process for Provision of Advice to the Science Working Group on the Status of Jack Mackerel in 2009

It was noted that the development of an agreed joint stock assessment approach of Chilean jack mackerel was an ongoing process and that there was a variety of work that was being undertaken and still needs to be undertaken to progress this issue. It was suggested that the absence of an agreed assessment model should not, however, prevent the Jack Mackerel Sub-group from providing advice to the Science Working Group on the status of Chilean jack mackerel. It was suggested that such advice could be based on the trends in indicators such as catch rates, the spatial distribution of catches, the size composition of the catch, biomass indices from acoustic and DEPM surveys, and on previous assessments. It was proposed that a meeting of the Jack Mackerel Sub-group be held later this year and that this meeting should examine indicators derived from the fishery for jack mackerel and from fishery-independent surveys. Participants strongly supported this approach and agreed to provide the relevant information.

There was agreement to examine such indicators in detail as a basis for providing advice on the status of Chilean jack mackerel. It was indicated that participants should supply the meeting with detailed reports on the information that they provide. Reports should show the trends in these indicators, describe how these indicators were calculated and describe the representativeness of the data on which they are based. The provision of these reports in advance of the meeting was also suggested as being desirable.

Members were reminded to consult the Table on page 14 of the 2008 workshop report which had provided a list of useful indicators, and the annex to the 2009 workshop programme that also gave guidance as the types of data and indicators that would be useful.

The following suggested list of indicators that would potentially be useful for assessing status of Chilean jack mackerel was proposed, but it was noted that this list was not prescriptive or intended to limit the information that might be supplied.

From the fishery:

Trends in catch

Trends in effort

Trends in area of the fishery

CPUE trends (nominal and standardised)

Size composition

Age composition

Estimates of fishing mortality

From surveys

- Acoustic indices of abundance
- Biomass estimates from egg and larval surveys
- Trends in the location and extent of spawning areas
- CPUE
- Size composition
- Age composition

Biological

- Size or age at maturity
- Condition factors

Environmental indices

- Hydrographic data
- Salinity, temperature, DO

9. Revisions to the Jack Mackerel Species Profile

Discussion began on the revised Chilean jack mackerel profile and particularly on the issue of the evidence for the timing and nature of its reported expansion across the south Pacific. It was agreed that discussion on the revised profile was best progressed by the circulation among sub-group members of the revised profile by email with all the changes to the text marked. The Chair undertook to initiate this process.

10.Future Jack Mackerel Sub-Group work programme

Proposed future work included two items from the Chilean Jack Mackerel Assessment Methods Workshop: the investigation of potential difference in age estimation protocols among countries and the work of the Assessment Simulation Task Team.

In addition there was the portfolio of work already outlined in the Stock Structure Research Programme, and the preparations for the next Jack Mackerel Sub-group meeting in 2009 that would examine indicators of the status of Chilean jack mackerel.

The work to prepare for the provision of advice on the status of Chilean jack mackerel was considered the most important task in the short term, but it was agreed that progress on the other matters should proceed in parallel with these activities.

11.Chairmanship of the Jack Mackerel Sub-Group

The Chair advised that he would not be available to chair future meetings of the Jack Mackerel Sub-group and that Australia had indicated it was no longer able to provide a person to be chair of the sub-group.

There was a preference expressed for the future chair to come from a country that was not a major participant in the fishery for Chilean jack mackerel.

There were no nominations received for the position of chair and members were urged to consult with potential candidates to seek a replacement as soon as possible.

12.Other Matters

Proposal on the use of acoustic data from industry vessels

There was discussion on the paper provided (SP-07-SWG-JM-03) that outlined the work that has been undertaken by the ICES Fisheries Acoustics, Science and Technology Working Group and the proposal to collect acoustic data from industry vessels during fishing activities. As noted in the report of the Stock Assessment Methods workshop, such data could provide information at times between surveys and in more detail for the times and locations when fishing was occurring. It could also provide information not only on jack mackerel but also on their predators and prey, other species and environmental conditions.

The detailed work on this issue by the specialist ICES working group was noted and it was felt that members should, where appropriate, follow the recommendations of this group. It was noted that a number of SPRFMO countries were already represented on this ICES working group and contact with it should be maintained.

There was support for this approach in principle and members were encouraged to work with their industry members and to adopt a consistent protocol for the collection of these data following the proposals of the ICES working group.

Timing, location and purpose of future Jack Mackerel Sub-group meetings

It was noted that an additional meeting of the Jack Mackerel Sub-group for later in the year had already been agreed.

There was support for holding only one formal meeting of the Jack Mackerel Sub-group each year.

It was noted that there may be the need for additional meetings of a group of members or specialists involved in specific research activities but that these would not be formal meetings of the Jack Mackerel Sub-group.

Further discussion of this issue was deferred to the similar item on the agenda of the SWG.

13.Adoption of Jack-Mackerel Sub-Group Report and Summary

The report was adopted after all agreed amendments were made.

Annex SWG-JM-01

REPORT OF THE

CHILEAN JACK MACKEREL ASSESSMENT METHODS WORKSHOP

4 – 8 May 2009

Lima, Peru

Introduction

The interim measures adopted for pelagic fisheries in the area of the proposed South Pacific Regional Fisheries Management Organisation (SPRFMO) require the SWG to provide advice, in 2009, on the status of pelagic stocks in the SPRFMO area, the most important of which is the Chilean jack mackerel. One of the first steps towards the assessment of the stock abundance and the sustainable yield of the Chilean jack mackerel (*Trachurus murphyi*) in the South Pacific Ocean was the development of working population structure hypotheses upon which to base such assessments, and the identification and characterization of the biological, catch and effort data available to use in stock assessments.

Accordingly, at its third meeting (held in Reñaca, Chile, in April 2007), the Science Working Group (SWG) of the South Pacific Regional Fisheries Management Organization (SPRFMO) recommended that a specific Jack Mackerel Stock Structure and Assessment Workshop be convened to specifically discuss and develop agreed working hypotheses on jack mackerel stock structure, and to consider joint fish stock assessment requirements and inputs under such stock structure hypotheses. This Jack Mackerel Stock Structure and Assessment Workshop was held in Santiago, Chile in 2008. The results of this workshop contributed important scientific information for the assessment, and for the provision of the advice requested on the status of Chilean jack mackerel.

The workshop identified four working stock structure hypotheses for Chilean jack mackerel. These comprise alternate hypotheses about the relationship between the stocks off Peru and Chile, and alternate hypotheses about the relationship between stocks off Chile and the adjacent areas of the high seas. The 2008 workshop also provided a number of conclusions and recommendations about data needs, future assessment processes and assessment models.

The Jack Mackerel Assessment Methods Workshop (reported here) was then held to further progress the development of a joint assessment of the status of Chilean jack mackerel.

Opening Ceremony

The Chilean Jack Mackerel Stock Assessment Methods Workshop was held in Lima, Peru from 4 – 8 May 2009. The meeting was attended by 29 participants from Australia, Chile, China, European Union, Peru, Russian Federation, and the SPRFMO Interim Secretariat.

The opening ceremony was opened by Rear Admiral Hector Soldi Soldi, President of the Board of Directors of the Marine Research Institute of Peru (IMARPE).

In the opening ceremony, Dr. Alfonso Miranda Eyzaguirre, Vice Minister of Fisheries for Peru, highlighted both the importance of high seas fisheries and the need for international cooperation to ensure they are not overexploited. He reported that an assessment by the University of British Columbia had ranked Peru as being among the leading countries for seven fishing indicators for applying conservation and management measures for living resource, protection of biodiversity and fisheries sustainability.

Mr. Sandy Morison, Chair of the workshop, thanked Peru for hosting the workshop and for the excellent facilities provided. He commented on the impressive amount and quality of the scientific work that has been undertaken on Chilean jack mackerel and on the level of collaboration there has been in past meetings. He highlighted the importance of continued collaboration and expressed his confidence that the workshop would meet its objectives.

The full list of participants to the Workshop is attached in Annex SA-01.

Confirmation of Chairperson

Mr. Sandy Morison was confirmed as Chair of the Workshop.

Nomination of Rapporteurs

Scientists from Chile and Russia offered to act as rapporteurs for the workshop.

Agenda, Workshop Objectives and meeting arrangements

The draft agenda was discussed and was revised after agreement that options for modelling were not considered separately for each of the stock structure hypotheses as it was considered that each assessment model could assess status under a range of hypotheses.

The Chair and others provided an outline of the unsuccessful attempts that had been made to secure an independent stock assessment expert for this workshop.

The revised agenda (SP-07-SWG-JM-SA-01) was adopted and is attached as Annex SA-02.

The draft workshop objectives were discussed. It was agreed that the emphasis of the workshop was to be on methods for the assessment of Chilean jack mackerel, to identify the data needed for these assessments, and to agree on the parameters for such assessments. The final workshop objectives adopted were:

1. To agree on standard datasets for use in all stock assessment models under different stock structure hypotheses, and a process for creation and exchange of these data sets.
2. To specify and agree on model specifications, assumptions, values for life history parameters to be used in the stock assessments (M, Sexual maturity, etc.), data

(including the level of spatial and temporal data aggregation), and other inputs to the assessments to be undertaken in the 2009.

3. To identify useful target biological reference points and limit reference points to facilitate the diagnosis of stock status.
4. To conduct a preliminary evaluation of jack mackerel stock assessment models used to date.
5. To agree on stock assessment modelling approaches to take forward in the 2009 and future Chilean jack mackerel assessments.
6. To document a stock assessment working protocol covering all the aspects defined above.

Other aspects of the Draft Workshop Programme (SP-07-SWG-JM-SA-02) were not reviewed or revised.

Review of results of 2008 workshop.

The Chair presented a brief overview of the results of the 2008 Jack Mackerel Stock Structure and Assessment Workshop that were relevant to the current workshop including the main issues for stock assessments that were raised and the desirable characteristics of stock assessment models that were identified.

Overview of recent assessment results

Chile noted that it did not have an updated assessment available. Instead, a presentation (SP-07-SWG-JM-SA-INF-07) was given on the development of its stock assessment methods for Chilean jack mackerel, describing the progression towards the current integrated assessment.

There was a presentation on the monitoring and assessment of Peru's main fisheries (SP-07-SWG-JM-SA-07) including for jack mackerel. This provided an overview of its acoustic surveys on Chilean jack mackerel including the time series of biomass estimates and the changes in the distribution of Chilean jack mackerel out to 100 nm.

Development of Standard datasets

The importance of both the quality and quantity of data available and the need to agree on how data are to be used in assessment models was reiterated. It was noted that this would be important for reducing the number of assumptions needed in assessment models and avoiding fundamental inconsistencies among them. It was agreed that data requirements would be also be determined by the types of assessment models that were agreed to be used.

A desire was expressed for models to be as simple as possible to allow non-modellers to understand and work with them. However, it was also pointed out that there are many complexities to the biology of the fish and the development of the fishery that need to be reflected in any assessment model.

It was noted that the 2008 workshop held in Santiago had already produced an inventory of the available data which was useful for determining the types of models that could be applied to the assessment of Chilean jack mackerel.

The possibility of comparing models with simulated data was raised and supported. This option was agreed because it was recognised that all the data that would be needed to run assessment models was not going to be available in the short term. Some participants expressed concern at the unavailability of data from all countries.

The Chair commented that the development and use of simulated data could be useful for the investigation of the performance of assessment models. But it is was important to realise that it would not allow the jack mackerel sub-group to provide any additional advice to the Science Working Group on the current status of Chilean jack mackerel in 2009.

Further discussion on this agenda item was deferred until after detail of assessment models were discussed.

The development and use of the simulated data set is described below under the heading of the evaluation of assessment models.

It was agreed that further discussion of standard datasets and the process for their exchange be deferred to a future meeting and should await the development of agreed assessment models.

Model Inputs

There was a presentation on the review paper on some biological aspects of Chilean jack mackerel (SP-07-SWG-JM-SA-05) that covered age estimation and growth, size and age at sexual maturity, and natural mortality.

There was also a presentation (SP-07-SWG-JM-SA-INF-08) on the estimates made by Peruvian scientists of age and growth, reproductive parameters, natural mortality, diets, and on work on tagging techniques.

These presentations highlighted the extent of the variation in the reported values for these parameters and the need for agreement on the values to use in assessments. It was agreed that rather than select specific values at this stage it was important to agree on the range of values to be used as possible sensitivities in assessments.

Age and growth

The information presented indicated substantial differences between the estimated growth rates of Chilean jack mackerel from Peru and Chile. Some of the variation in growth curves was attributed to non-representative sampling and some to methodological differences in the interpretation of otoliths, but it was acknowledged that there may also be regional variation in growth rates. All laboratories read otoliths whole under reflected light so there are no differences in methods of preparation that may contribute to the differences in age estimation.

It was agreed that is was very important that these differences be resolved as quickly as possible.

The following process was agreed to address the issue of potential differences in age estimation protocols with the timetable to be finalised after consultation with key staff in each country:

- Each laboratory contributing a sample covering the full range of fish sizes to form a combined reference set
- There would then be an exchange of otoliths so that all otoliths in this reference set would be read by experienced readers in each of the collaborating laboratories.
- All readers should be provided with the data normally made available to them at the time of reading, but this should not include any information on the ages assigned by other readers.
- A comparison of the ages determined for this common reference set would provide data on the extent of any differences in interpretation among readers and laboratories.
- If significant differences in interpretation were confirmed a workshop of key technical staff would then be needed to help clarify the basis for any disagreements and work towards an agreed protocol for age estimation.
- This work should be concluded and the results reported back to the JMSG by the next meeting if not sooner.

A common 'birthday' of 1 January was agreed to be used for Chilean jack mackerel.

Laboratories from Chile, Peru and the EC agreed to be involved in these activities with invitations also extended to New Zealand and other interested parties. The EC reported that they are currently training a staff member in age estimation to follow the methods employed by scientists in Chile.

The Chair advised that comparisons of the ages estimated can be effectively represented using age-bias plots as described in Campana *et al*. (1995)[1].

The Chair also suggested that if a workshop on age estimation was needed that an independent expert would be useful and that the EC was a likely source of such a person with both experience with *Trachurus* sp., and knowledge of the process of inter-laboratory calibration, because of the similar work that the European Fish Ageing Network has previously undertaken.

Some work done in Chile on sectioned otoliths indicated that this mode of preparation produced estimates of age that were older in some fish. The differences were not considered to be important because they mostly occurred in older fish. Fish of 12 years and older were also rare in the catches and combined in a plus-group in their assessment model.

Counts of daily growth increments have been used to validate the location of the first and second annual increments, but it was reported that this method cannot be used for older ages because the daily growth increments become too closely spaced.

Length and age at maturity

There were some differences in terminology regarding length or age at maturity between fish from Chile and Peru with some uses meaning the smallest or youngest mature fish that have been observed and others referring the length or age at which 50% of fish were mature.

It was agreed that maturity is best represented by a vector showing the proportion mature at each length or age so that a maturity ogive can be calculated.

[1] Campana, S.E., Annand, M.C., and McMillan, J.I. (1995). Graphical and statistical methods for determining the consistency of age determinations. Transactions of the American Fisheries Society 124, 131-138.

The maturity scales used by Chile and Peru differed in the number of categories but this was not considered to contribute to any differences in interpretation of maturity.

Peru had recorded fish maturing at younger lengths than Chile by several centimetres. This difference was not attributable to differences in methods or terminology. Off Peru the mean length at first maturity was 21.3 cm TL compared to about 25 cm FL (approximately 27 cm TL) for Chile.

This is also reflected in differences in age at maturity but these differences are affected by the differences in age and growth mentioned above.

These differences were thought to be due to the high biological production off Peru and because of environmental conditions the Chilean jack mackerel could grow faster and reach maturity at smaller lengths.

Natural mortality

Values for natural mortality reported in SP-07-SWG-JM-SA-05, based on the methods of Pauly, Hoenig, and Alverson-Carney, ranged between 0.22 yr^{-1} and 0.27 yr^{-1}. However, a subsequent estimate for fish from Peru, also based on Pauly's method, produced an estimate of 0.33 yr^{-1}.

This difference reflected a combination of the differences in water temperature and estimated growth rates in the two regions.

The differences cannot be resolved until the differences in age estimates and growth are resolved.

The need for assessment models to investigate sensitivity to a range of natural mortality values was reiterated.

Acoustic indices

There was a presentation on the potential use of industry vessels to gather additional acoustic data to that provided by standard scientific surveys (SP-07-JM-SA-08). These data could provide information at times between surveys and in more detail for the times and locations when fishing was occurring. It could also provide information not only on jack mackerel but also on their predators and prey, other species and environmental conditions.

There was general support for this proposed use of industry vessels in this way and it was suggested that a more specific proposal be developed for submission to the SWG for its consideration.

There was also acknowledgement that this proposal, while useful in the future, would not assist with the immediate task of providing advice on the status of jack mackerel this year.

CPUE as an index of abundance

The issues with CPUE as an index of abundance at the 2008 jack mackerel workshop were reviewed and discussed.

There was support for the continued use of CPUE, if it was appropriately standardised, for a number of reasons including that it was easy to obtain, covered a long time period and covered some early years of the fishery when no other index was available.

The issue of hyper-stability was discussed and there was some concern expressed that it was not possible to assess its importance without some independent estimate of biomass. But it was reported that it was possible to statistically to account for this potential problem.

Peru reported that it was developing new ways to measure effort using observers and was also investigating the use of search time as a better measure of effort. There was support for the use of search time as a better measure of effort but it was acknowledged that data on this measure was not always easy to collect and, while it may help in the future, any new measure of effort could not be used with historical data sets.

It was agreed that it was not desirable to try and establish a single agreed unit for measuring effort but that the methods should be selected to suit the characteristics of individual fleets.

The value of obtaining CPUE indices from the distant water fleets was also mentioned, particularly from the Russian fleet but also from more recent fishing activities.

Stock-Recruitment Relationships

The different uses of a stock-recruitment relationship in the assessment process were noted, such as during model fitting and for future projections. It was indicated that a Beverton-Holt relationship was now considered by Chilean assessment scientists to be more suitable for stocks of Chilean jack mackerel than the Ricker model that was previously used.

Attempts by scientists from both Chile and Peru to get indices of recruitment were mentioned. It was noted that there was information on recruitment contained in the catch-at-age matrix that was used in assessments.

Identification of target and limit reference points

There was a presentation on the paper which provided a review of biological reference points and management for Chilean jack mackerel (SP-07-SWG-JM-SA-06). This paper also contained a table that summarised the limit, threshold and target reference points as they were defined and used by the U.S.A. and several international fisheries management organisations.

The dynamic nature of populations of Chilean jack mackerel was noted and that they responded to changes in oceanographic conditions. Chile has therefore adopted a dynamic reference point based on the current spawning biomass relative to that which would have been present in the absence of fishing. This recognises that there will be changes in the biomass even in the absence of fishing and avoids the concept of a static unfished reference biomass.

There have been regime shifts noted in the past for Chilean jack mackerel that have changed their abundance, recruitment and distribution patterns. Any reference points set would need to take into account the potential for such changes to occur again in the future.

The linkage between assessment models and reference points was noted, as was the benefits of using Management Strategy Evaluation to test models together with particular reference points.

It was noted that the estimates of the biological reference points would depend on the values adopted for life history parameters which also adds uncertainty to the process for their estimation.

Other options for suitable reference points were discussed but no particular set of candidate reference points was proposed.

Evaluation of Current Assessment Models

There have been no updated assessment models presented since the workshop in Santiago in 2008.

There was a presentation on the paper (SP-07-SWG-JM-SA-04) which proposed an integrated assessment model that could be used to assess the status of Chilean jack mackerel. The paper suggested that this proposed approach would allow assessment under the different stock structure hypotheses with an objective statistical comparison of the models.

There was support from some participants for the proposed approach.

There was general support for using a simulated dataset. It was agreed that a simulated data set would be generated that would represent a simulated stock of Chilean jack mackerel. This would be used to allow the development, testing and comparison of models.

A presentation was made by the Russian Federation on a similar process that had been conducted for herring stocks by ICES (SP-07-SWG-JM-SA-INF-09).

A task team of specialists (the Assessment Simulation Task Team) was nominated to decide on the detailed characteristics of this dataset, following the ICES example. This task team was to comprise specialists from Chile, Peru, the Russian Federation and the EC. This task team developed a process for the development of the simulated dataset and testing of the models, including criteria for the evaluation of model performance (Annex SA-05).

It was agreed that the assistance of an independent stock assessment expert again be sought to guide this process, generate the simulated dataset, assist with the analysis of the results, and attend the next meeting where the results would be reported.

The Chair offered to initiate contact with suitable candidates for the role of independent expert. He contacted Dr Jim Ianelli who indicated that he would be willing to assist with the simulation exercise.

Candidate assessment models that were identified for this exercise were an integrated assessment model developed by Chile, an Integrated Catch Analysis to be undertaken by the EC and a TISVPA model developed by the Russian Federation. Peru was also to consider developing an assessment model that would use this simulated dataset.

Documentation of a stock assessment working protocol

It was agreed that the development of a working protocol for stock assessment was premature at this stage and that this should wait until the assessment model or models have been developed and agreed.

Review and Adoption of Workshop Report

The report was adopted after all agreed amendments.

ANNEX SA-01

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ANNEX SA-02

AGENDA

The background and objectives for the Jack Mackerel Stock Assessment Methods Workshop are outlined in the Workshop Programme

1. Welcome & Introductions

1.1 Opening of the Workshop.

1.2 Workshop arrangements.

1.3 Nomination of rapporteurs.

1.4 Review and approval of the workshop objectives and agenda.

1.5 Review of results of 2008 workshop.

2. Overview of recent assessment results

2.1 Updates on fishery characterizations and results of recent assessments from major catching countries.

3. Development of standard datasets

3.1 Development of agreed standard datasets and process for data sharing.

4. Model inputs

4.1 Review of common input parameters to assessment models: natural mortality, size and age at maturity, growth etc.

5. Identification of target and limit reference points

5.1 Identification of potential target and limit reference points and appropriate indicators

6. Evaluation of current assessment models

Consideration of issues of data availability, model structure, alternative scenarios, and future modelling approaches.

7. Documentation of a stock assessment working protocol

7.1 Identification of important elements of a stock assessment protocol

7.2 Document a draft protocol for the assessment of Chilean jack mackerel.

8. Review of progress

8.1 Review of progress and agreement on the use of remaining time.

9. Review and Adoption of Workshop Report

9.1 Presentation of the Draft Report of the Workshop

9.2 Review and Adoption of the Workshop Report.

9.3 Closing of the Workshop

Annex SA-03

Workshop Programme

Background

The interim measures adopted for pelagic fisheries in the SPRFMO area, require the SWG to provide advice, in 2009, on the status of pelagic stocks in the SPRFMO area, the most important of which is the Chilean jack mackerel. One of the first steps towards the assessment of the stock abundance and the sustainable yield of the Chilean jack mackerel (*Trachurus murphyi*) in the South Pacific Ocean was the development of working population structure hypotheses upon which to base such assessments, and the identification and characterization of the biological, catch and effort data available to use in stock assessments.

Accordingly, at its third meeting (held in Reñaca, Chile, in April 2007), the Science Working Group (SWG) of the South Pacific Regional Fisheries Management Organization (SPRFMO) recommended that a specific Jack Mackerel Stock Structure and Assessment Workshop be convened to specifically discuss and develop agreed working hypotheses on jack mackerel stock structure, and to consider joint fish stock assessment requirements and inputs under such stock structure hypotheses. This Jack Mackerel Stock Structure and Assessment Workshop was held in Santiago, Chile in 2008. The results of this workshop contributed important scientific information for the assessment, and for the provision of the advice requested on the status of Chilean jack mackerel.

The workshop identified four working stock structure hypotheses for Chilean jack mackerel. These comprise alternate hypotheses about the relationship between the stocks off Peru and Chile (hypotheses 1 and 2), and alternate hypotheses about the relationship between stocks off Chile and the adjacent areas of the high seas (hypotheses 3 and 4).

<u>Hypothesis 1:</u> Jack mackerel caught off the coasts of Peru and Chile each constitute separate stocks which straddle the high seas.

This is the current hypothesis expressed in the Jack Mackerel Species Profile and used in past stock assessments. There is a fairly substantial amount of historic and current evidence supporting this hypothesis. However, there are some indications of shifts in distribution, and perhaps of possible mixing, in the southern Peru / northern Chile area related to

oceanographic changes, and additional work is required to determine the most likely boundary between separate Peruvian and Chilean stocks. For the purposes of jack mackerel assessments to be conducted in the immediate future, separation at the Peruvian / Chilean border would be a reasonable and convenient assumption to use under this stock hypothesis, until further information becomes available to improve the definition of stock boundaries.

<u>Hypothesis 2:</u> Jack mackerel caught off the coasts of Peru and Chile constitute a single

shared stock which straddles the high seas.

Some new information on similarities in biological and population structure trends observed off southern Peru and off Chile was presented at this workshop in support of this alternate hypothesis.

Additional work is required to further investigate a wider range of data which might support or reject this hypothesis, as proposed under the multi-disciplinary Stock Structure Research Programme.

<u>Hypothesis 3:</u> Jack mackerel caught off the Chilean area constitute a single straddling stock extending from the coast out to about 120°W.

This is one of the current hypotheses expressed in the Jack Mackerel Species Profile, and is the hypotheses currently used in Chilean stock assessments. There is a fairly substantial amount of evidence supporting this hypothesis. However, there is little information upon which to base a reliable definition of the westward boundary of such a stock, and additional work is required to determine the most likely westward boundary of a straddling Chilean stock. For the purposes of jack mackerel assessments to be conducted in the immediate future, the westward boundary of this stock could be assumed to be about 120°W, to cover all areas currently fished in the southeast Pacific Ocean, until further information becomes available to improve the definition of this boundary.

<u>Hypothesis 4:</u> Jack mackerel caught off the Chilean area constitute separate straddling and high seas stocks.

Little information is available upon which to base a reliable definition of the boundary between such stocks. Additional work is required to determine to most likely position of such a boundary.

The 2008 workshop also provided a number of conclusions and recommendations about data needs, future assessment processes and assessment models. Participants are asked to review this report and implement these where appropriate.

Participants are also reminded that the Plenary meeting in October 2008 approved the request from the SWG for the release of non public domain data to the Jack Mackerel Subgroup for the purposes of stock assessment,

This important measure followed one of the recommendations of the 2008 workshop in recognition of the need for data at a finer resolution than 5°x5° square for the conduct of effective stock assessments for jack mackerel.

Because of the unavailability of an independent stock assessment expert for this workshop, it is particularly important that participants arrange for participation of their own experts with skills in stock assessment for the workshop. It is expected that such participants will contribute to the evaluation of the strengths of different assessment methods in a scientifically objective and impartial manner.

Objectives

The following objectives are proposed for the workshop:

1. To agree on standard datasets for use in all stock assessment models under different stock structure hypotheses, and a process for creation and exchange of these data sets.
2. To specify and agree on model specifications, assumptions, values for life history parameters to be used in the stock assessments (M, Sexual maturity, etc.), data (including the level of spatial and temporal data aggregation), and other inputs to the assessments to be undertaken in the 2009.
3. To identify the types of biological reference points that would be calculable and useful for the diagnosis of stock status for Chilean jack mackerel stocks.
4. To conduct a preliminary evaluation of jack mackerel stock assessment models used to date.

5. To agree on stock assessment modelling approaches to take forward in the 2009 and future JM assessments.
6. To document a stock assessment working protocol covering all the aspects defined above.

A specific workshop agenda to address these objectives will be finalised and agreed at the start of the workshop.

It is expected that, as an outcome of its analyses and discussions, the Workshop will produce a technical report with its findings, conclusions and recommendations on the above matters. Such a report should be comprehensive and clear enough to provide guidance to participants in the inter-sessional preparation of jack mackerel stock assessments under the various stock structure hypotheses, for review at the next Jack Mackerel Sub-Group stock assessment meeting, towards the end of 2009.

Venue and Dates

The workshop will be held from 4 to 8 May 2009 in Lima, Peru at Foresta Hotel and Suites**:**

Avenida Libertadores N° 490, San Isidro, Lima

http://www.southpacificrfmo.org/7th-international-meeting-Information-for-Delegates/

Inputs to the Workshop

In order to meet the proposed objectives and produce the desired results, participants are expected to provide the Interim Secretariat with the data required under the agreed Data Standards, and are also requested to provide the types of data identified in the 2008 Workshop Report[2], and listed in the Annex attached to this draft workshop programme. These data should either be submitted to the Interim Secretariat prior to the start of the workshop, or alternatively should be brought along to the workshop itself.

This workshop should be less formal than the 2008 workshop, with fewer papers and presentations, and more emphasis on technical discussions around suitable stock assessment methods and data inputs. An update from each of the major catching countries on their latest assessment results would be useful if these have been updated since last year's workshop. Prospective participants should provide titles and short abstracts (maximum half a page) of any proposed papers in electronic form by email addressed ***to the Interim Secretariat (interim.secretariat@southpacificrfmo.org)*** as soon as possible, and preferably ***by Friday 24 April 2009***, to facilitate planning of the various workshop sessions. The actual technical documents and other written contributions to be reviewed and used during the Workshop should be provided in advance so that contributions can be compiled and circulated to other participants in advance of the workshop.

Appropriate stock assessment modelling approaches for jack mackerel will be developed after careful consideration by the workshop of what data will be available for use in such assessments, including consideration of data coverage (by area or time) and representivity (whether data have been adequately stratified across known stock distribution ranges and size / age classes). Adequate data will specifically be required to assess stocks under any of the agreed stock structure hypotheses.

[2]http://www.southpacificrfmo.org/chilean-jack-mackerel-workshop/

The revised draft of the Chilean jack mackerel profile that is available on the SPRFMO web pages[3] reflects the current knowledge of the species biology and main fisheries including the information provided to the 2008 workshop. Any documents to be provided should not repeat such information. Relevant information not contained in the current profile could be made available to allow an updated version to be prepared during the workshop.

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[3] http://www.southpacificrfmo.org/science-working-group/swg-profiles/species-profiles

Annex SA-4

Document list

Meeting Documents

SP-07-SWG-JM-SA-01	Agenda
SP-07-SWG-JM-SA-02	Workshop Programme
SP-07-SWG-JM-SA-03	Workshop Document List
SP-07-SWG-JM-SA-04	Approach to the implementation of hypotheses
SP-07-SWG-JM-SA-05	Short review of some biological aspects of the Chilean jack mackerel
SP-07-SWG-JM-SA-06	Review of biological reference points
SP-07-SWG-JM-SA-07	Hydro-acoustic assessment jurel IMARPE
SP-07-SWG-JM-SA-08	Abstract Peru proposal about using fishing vessels

Information papers

SP-07-SWG-JM-SA-INF-01	Commonwealth fisheries harvest strategy: Policy and Guidelines
SP-07-SWG-JM-SA-INF-02	FAO Fisheries Technical Paper No. 347: Reference points for fisheries management
SP-07-SWG-JM-SA-INF-03	Harvest strategy standard for New Zealand fisheries

Presentations

SP-07-SW-JM-SA-INF-04	Jack mackerel fishery - Peru
SP-07-SW-JM-SA-INF-05	Acoustic evaluation of jack mackerel by IMARPE (6 MB)
SP-07-SW-JM-SA-INF-06	Biological Reference Points – Chile
SP-07-SW-JM-SA-INF-07	Development of the Chilean stock assessment approach

SP-07-SW-JM-SA-INF-08 Estimates of age, growth, size and age at maturity and natural mortality - Peru

SP-07-SW-JM-SA-INF-09 ICES simulated data sets

Annex SA- 5

Report of the Assessment Simulation Task Team

The Assessment Simulation Task Team have developed the following proposal to provide simulated data to the stock assessment modelers and to explore the performance of different assessment models that have been proposed to be applied to Chilean jack mackerel.

The task team agreed that there was a need for an independent expert to generate and provide a simulated data set that will be used as input for the final proposed modeling frameworks.

The task team proposed to hold a workshop to facilitate agreement on the assumptions needed for the development of the models. Otherwise differences in the assumptions used for different models could produce differences in the model outputs.

The workshop should be held as soon as possible depending on the availability of the key participants.

The task team agreed that it was desirable to simulate data for a stock that was fished by three different fleets (two with the known characteristics of purse seine fleets and one with the known characteristics of a mid water trawl fleet).

The dataset should consider the available information presented at the Chilean Jack Mackerel Stock Structure and Assessment Workshop held in Santiago in 2008 and summarized in the table on page 14 of the report of that workshop.

A simulated dataset has been produced for the use in the evaluation of models used in the assessment of the Norwegian Herring stock. Although there are some similarities between this fishery and the Chilean jack mackerel fishery, the task team regarded it only as an example of how simulated datasets can be produced.

The simulated stock of Chilean jack mackerel should live for up to 20 years old and produce a catch-at-age matrix for the simulated fishery that includes fish from age 2 up to 12+. The dataset should cover a time period of 30 years.

The simulated data should include:

- Catch-at-age and catch-at-length data for each fleet.
- One of the purse seine fleets should mainly catch larger adults and the other purse seine fleet should catch smaller adults. The mid water trawl fleet should catch all adults.
- Matrixes of mean weight-at-age by year and at the beginning of each year.
- Weight-at-length relationships by year.
- Growth functions for growth in length and weight.
- Maturity ogive.
- Natural mortality.
- Total catch in weight for each fleet for each of 30 years.
- Fishery independent indices of abundance including
    - A CPUE for each of the different fleets
    - Acoustic biomass estimates (structured by age)
    - Spawning biomass (from the DEPM) estimates (structured by age).

Other considerations:
Some gaps should be produced in the fishery independent indices of abundance (short series and/or in the middle of the series)

The dataset should include variation in abundance levels reflecting variation in recruitment.

Selectivity of each fleet should not be stable but have atypical selection in some years

The catch-at-age and catch-at-size time series should also be affected by both random noise and noise from a trend over some periods. This should produce outliers for some years.

The variation in stock abundance should influence the catch matrices for each fleet.

The catch-at-age dataset may vary for the three different fleets.

There should be periods of high and low fishing pressure on the population.

One purse seine fleet should produce half the catch of the other one.

The model of recruitment should allow for non-systematic changes and for autocorrelation between years because environmental changes could generate periods with different levels of productivity.

Performance of the models:

The performance of the models will be assessed by comparing the true simulated population and the results obtained by the models. Statistical indices like the Akaike Information Index or a comparison of the differences in residuals may be used for these comparisons. Other options to assess the performance of the different models could be discussed in the proposed workshop.

Region	Peru	N-C Chile	C-S Chile	W of EEZ Chilean	W of EEZ	W of 120 Russ. Fed.	NZ (EEZ only)
Fishery							
Catch	1950-2007, monthly, 1995-2007, daily	1975-2007	1975-2007	1981-2007	1979-91[R] 2000-07[C] 2003-07[K]	1980-83, 1989-91	1985 – 2007
Effort	1980 - 2007, by fleet, trip	1975-2007	1981-2007	1992-2007	1979-91[R] 2003-07[K]	1980-83, 1989-91	1985 – 2007
Standardization	Vessel, area, month	-	Yes	Yes/No	1979-91[R]	1980-83, 1989-91	Vessel, area, month
Fishery Age	-	1975-2007	1975-2007	1992-2007	1979-91[R] 2006[C]	1980-83, 1989-91	1990 - 2007, otolith sections
Fishery length frequency	1990 - 2007	1975-2007	1975-2007	1981-2007	1979-91[R]	1980-83, 1989-91	1986 - 2007
Surveys							
Acoustic	1983 - 2007	1981-1995, 2006-2007	1997-2007	2003-2007	1986-88, 2002-03[R] 2003[K]	1980-83, 1989-91	No
Spawning		No	1999-2006	1999-2006			No
Eggs and larvae		1982-2007	1999-2006	1999-2006	2003[K]		
CPUE	1996 - 2007, Std by haul, trip-length	No	No	No	1986-88, 2002-03[R] 2000-07[C] 2003[K]	1980-83, 1989-91	1991 - 2007, standardised MWT
Survey age		No	1997-2007	2003-2007	1986-88, 2002-03[R]	1980-83, 1989-91	No
Survey size	1983-2007	No	1997-2007	2003-2007	1986-88, 2002-03[R]	1980-83, 1989-91	No
Biological data							
Growth	Oto: 1980, 2005; Scales: 1983	Yes	Yes	Yes	1979-91, 2002-03[R] 2000-07[C] 2003[K]	1980-83, 1989-91	Yes, from otoliths
Maturity (age/size)	Yes, surveys and fisheries	Yes	Age and size	Yes	Yes[R] 20006[C]	1980-83, 1989-91	Yes, obs. and landings
Natural mortality	Yes		Yes				Possibly
Environmental indices							
	SST, Salinity, 1960-2007	SST, salinity, 1964-2007	SST, salinity, 1964-2007		Temperature and salinity profiles 1979-1991, 2002-03[R]. SST, salinity 2003[K]	Temperature and salinity profiles 1980-1983, 1989-1991[R]	Possibly SST

[C] =China, [R]=Russian Federation, [K] = Republic of Korea

Annex SWG-04

Report of the

Deepwater Sub-group

12-15 May 2009

Lima, Peru

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1. Opening of the Meeting

The meeting of the Deepwater Sub-Group (DWSG) was opened by the Chair of the Science Working Group, Andrew Penney.

2. Adoption of Agenda

The draft agenda (SP-7-SWG-01) was adopted without modification.

3. Administrative Arrangements

3.1 Meeting documents

Nine documents, SWG-DW-01 to SWG-DW-04 and SWG-INF-01 to SWG-INF-05, were tabled for discussion by the DWSG.

4. Nomination of Rapporteurs

Kelly Denit offered to act as rapporteur for the meeting.

5. Chairmanship of the Deepwater Sub-Group

A number of requests for nominations for the Chair of the Deepwater Sub-Group have previously been circulated to all participants by the Secretariat. Up to the time of the start of meeting, no nominations had been received.

Chile indicated their intention to provide a nomination for the Chair of the Deepwater Sub-Group, and undertook to forward this nomination to the Secretariat soon after the meeting. The Secretariat will circulate this nomination to all participants for consideration, together with any other nominations which might be received. These nominations will be considered inter-sessionally and a Chairman for the Sub-Group will be agreed at the next meeting.

The Chair of the SWG agreed to Chair the current meeting, but noted that he could not Chair agenda item 6, under which the New Zealand bottom fishery impact assessment would be reviewed. The meeting agreed that Robin Allen, SPRFMO Executive Secretary, should Chair discussions under agenda item 6.

6. Review of Bottom Fishery Impact Assessments

6.1 Review of the New Zealand Bottom Fishery Impact Assessment

New Zealand provided a brief overview of their benthic fishery assessment, which was submitted to the Secretariat in December 2008. Additional information relevant to the assessment was presented in information documents SP-07-DW-INF-01 and INF–04. These papers provide additional detail on the analysis used by New Zealand in their benthic fishery impact assessment, particularly additional analysis of the representivity of closed areas based on depth, which was conducted after the impact assessment was submitted to SPRFMO. New Zealand also provided information on their intentions with regard to management of bottom longlining, and of limiting bottom trawl and longline catches, which was still under consultation, and not included in the original assessment.

New Zealand emphasized their view that precautionary spatial closures are a more appropriate way to protect VMEs than a move-on rule, and that the move on rule is an initial and temporary mechanism to help identify where VMEs occur, as a first step towards implementing other management measures such as spatial closures. They noted that trawl nets are not very effective in detecting evidence of VMEs, and that a move-on rule potentially results in repetitive spread of effort and impact into unfished areas.

Participants expressed appreciation to New Zealand for the comprehensive benthic fishery impact assessment they produced. It was noted that the scale of a fishery is an important consideration when determining the level of detail of an assessment and that the analysis seemed appropriate for the scale of New Zealand's fishery.

The participants reviewed New Zealand's assessment using the series of questions adopted at the 4th meeting of the SPRFMO interim science working group (see Report of 4th SWG).

- *Will the proposed fishing activity be within recent average (2002 – 2006) effort levels ?*
- *Will the proposed fishing activity be within areas where fishing is 'currently occurring' ?*

Participants agreed the proposed fishing activities were within these limits. Specifically, the number of vessels participating, the amount of catch and the spatial location were within recent average levels and fished areas.

It was noted that the assessment did not discuss the potential impacts of fishing on bycatch species such as oreos. New Zealand noted that over 90% of the catch consisted of targeted orange roughy, and that by-catch levels were low. Nonetheless, additional catch trend analyses for the main bycatch species would be presented in future.

- *Is proposed fishing going to be conducted in areas where VMEs are known or likely to occur ? If so, will those areas be closed to fishing ? If such areas won't be closed, will adequate conservation and management measures be put in place to prevent 'significant adverse impact' on VMEs, and to ensure the long-term sustainability of deep-sea fish stocks ?*

Participants agreed the proposed fishing activity would occur in areas where VMEs are known or likely to occur. The participant from the USA expressed concern that the move-on rule only applied in certain areas that were open to fishing, and not in all open areas, although noted that the New Zealand approach of pre-determined open and closed areas based on past fishing effort was similar to the approach taken by the USA in their Alaskan bottom trawl fisheries. Participants raised the question of when and where the move-on provisions were intended to apply. Australia indicated they were currently implementing a move-on rule with 100% observer coverage in all areas, but with no spatial closures. Participants noted that impacts may occur in areas that are only closed to one participant's vessels and recommended that provision should be made in future analysis and discussions for evaluating the risk of such cumulative impacts by multiple participants.

Participants asked about the long-term sustainability of deep sea fish stocks. New Zealand indicated they were currently conducting a study to evaluate options for establishing area-based or feature based precautionary or sustainable catch limits for species such as orange roughy in the SPRFMO area.

- *What provisions have been made to detect evidence of fishing on VMEs, and to move 5nm away from such areas ? How will such evidence be documented and reported ?*

Participants noted that New Zealand had implemented a protocol to detect evidence of fishing on VMEs, though concern was expressed regarding the limited areas it was in place. New Zealand noted that no fishing had occurred in the "move on" blocks in 2008. The 100% observer coverage New Zealand requires in conjunction with the detailed VME data observers are required to collect, and which New Zealand will provide to the Interim Secretariat in the future, was acknowledged. Some participants expressed concern that the weight threshold levels in the New Zealand VME evidence protocol were too high.

New Zealand noted that the weight thresholds implemented under their protocol were substantially lower than those implemented in other RFMOs, particularly for particularly vulnerable species, and lower than the IUCN recommended levels for stony and black corals. A brief discussion regarding the threshold levels used in other regional fisheries management organizations such as the Commission for the Conservation of Antarctic Living Marine Resources (CCAMLR) and Northwest Atlantic Fisheries Organization (NAFO) ensued. The participants supported New Zealand's incorporation of a biodiversity index in its VME evidence protocol.

- *Will observers be appointed to each vessel, and will observer coverage levels be 'appropriate' ?*

New Zealand has implemented 100% observer coverage for bottom trawl vessels and 10% for bottom longline vessels. Participants noted that 100% coverage of trawl vessels was in

accordance with the requirements of the Observer Data Standards. There was brief discussion regarding "appropriate" levels of observer coverage for bottom longline vessels, with suggestions ranging from 8%-100%, depending on objectives. Participants noted that the appropriate level of coverage was dependent on the objectives of the programme, with higher coverage levels required to monitor rare events. The participants agreed this point needed further discussion, though not specifically in relation to New Zealand's assessment.

- *Have all vessels been equipped with operational VMS ?*

The participants noted that New Zealand had operational VMS on all vessels participating in the fishery. New Zealand reported that these VMS systems were fully compliant with the SPRFMO VMS Standard.

- *Are the proposed fishing activities likely to have significant adverse impacts on VMEs ? If so, will such activities be managed to prevent such impacts, or not authorized to proceed ?*

Participants noted that no quantitative definition of the term "significant" has been adopted, but concluded that this was not intended to imply any formal test of statistical significance. Participants noted that "significant" needs to be evaluated in the context of several elements identified in the FAO guidelines, such as extent, severity and vulnerability. Participants concluded that management measures implemented by New Zealand did not prevent all adverse impacts, as VMEs may still be impacted in areas left open to fishing, but that they did minimize adverse impacts to VMEs.

6.2 Review of Assessments Submitted by Other Participants

Participants noted that several countries have submitted data to the Interim Secretariat reporting catches of deep-sea fish stocks, but that no benthic fishery impact assessments, except for New Zealand's, have been submitted to the science working group. Australia, China and Belize were noted to have reported catches of orange roughy in 2007. Australia indicated they had conducted bottom fishing in 2008 and, although they have not yet submitted an assessment, they had implemented rules requiring fishing only in the existing footprint, a move on rule and 100% observer coverage. Australia indicated that an impact assessment for their bottom fishery would be forthcoming.

Participants expressed concern that bottom fishing was occurring without benthic fishery assessments having been submitted and encouraged all parties engaged in deep-sea fisheries to submit assessments as soon as possible.

When preparing future tables and reports summarising data submissions, the Interim Secretariat was asked to prepare authorized vessel tables that separate out whether any of the authorized vessels submitted by a participant are bottom fishing vessels. It was noted there may be a difference between authorized and active vessels, though the participants noted that if any vessels are authorized for bottom fishing, a benthic fishery impact assessment is expected.

7. SPRFMO Benthic Assessment Standard

A first draft of the SPRFMO Bottom Fishery Impact Assessment Standard (SP-7-SWG-DW-03) was tabled for discussion. The Chair noted that the SWG was required to develop this standard in terms of the SPRFMO interim measures for bottom fisheries. This standard is intended to replace the interim Benthic Assessment Framework adopted at the 4th SPRFMO meeting. The intention at this meeting was to conduct an initial review of this draft to identify key concerns and sections for revision or improvement, and then to conduct an inter-sessional process to revise the draft standard to address these concerns.

The Chair presented a brief overview of the intent and information sources used to prepare the various sections of the draft standard.

The meeting then listed key concerns and provided suggestions for improvement on each section of the draft:

Introduction & Rationale

This section contains useful background information, but not necessarily as part of the standard.

Purpose of the Standard

This section should cover Scope & Principles. The overall purpose should be to provide guidelines and a minimum standard for how to prepare assessments, but not necessarily be highly prescriptive.

There should be a more even balance between protection of VMEs and ensuring sustainability of low productivity deep-sea resources. However, the scope should not go beyond these two key components in this draft. This section should also provide for a later section on how to review assessments.

Definitions

While the FAO guidelines provide some guidance concerning risk to VMEs, a more general definition of risk is required, in the context of the purpose of assessments under the interim measures. This definition of risk will then guide how to evaluate such risks under the section on Environmental Risk and Impact Assessment.

Detection of Evidence of VMEs

This standard does require a specified protocol to apply across all SPRFMO participants and fisheries for definition and detection of evidence of VMEs during fishing operations. However, the proposed protocol in this draft may not be the appropriate one. Alternatives should be prepared and considered. In preparing alternatives, encounter protocols adopted by other RFMOs should be reviewed, and benthic by-catch data available to other countries analysed.

Separate encounter protocols, particularly with regard to threshold weights constituting evidence of a VME, will be required for different fishing methods. In particular, different protocols will be required for bottom trawling and bottom lining.

Reporting requirements under any VME encounter protocol should be linked to information reporting requirements in other sections of the document. In general, information gathering and reporting requirements throughout the document need to be re-arranged and coordinated.

With specific regard to reporting on encounters with evidence of VMEs, all data on benthic by-catch should be reported, and not just evidence that triggered a move-on rule. Immediate reporting to the Secretariat of triggering of a move-on rule is already required under the interim measures. Additional data on all benthic by-catch data collected under such a protocol should be reported on an annual basis. All benthic by-catch data will be important when evaluating repetitive encounters and mapping areas likely to contain VMEs.

With regard to the question of where and when a move-on rule should be applied, the intent of the interim measures is clearly that move-on rules should be applied in any area where management measures have not been implemented to prevent '*significant adverse impacts*' on VMEs. This transfers the burden of proof when considering whether to apply the move-on rule to definition of the term '*significant*'.

Designation of Areas as VMEs

When predicting areas likely to support VMEs (such as in habitat suitability or niche factor analysis), factors such as dissolved oxygen levels, productivity, seabed geology etc. should also be used, in addition to seabed bathymetry and topography.

It should not be pre-supposed that spatial closures are the only appropriate management measure in areas designated as '*known or likely*' to contain VMEs. Other measures such as gear modifications may be appropriate.

Mapping of Bottom Fishing Effort

There should be different footprint maps for different fishing methods.

Participants wish to consider alternate options for how, and at what spatial resolution, to map bottom fishing footprints, besides in 20 minute blocks, as currently defined in the draft.

Mapping of Vulnerable Marine Ecosystems

All benthic by-catch data, whether collected under VME encounter protocols, or other catch sampling programmes, must be submitted to the Secretariat and included in the SPRFMO geospatial database. Such data should be used when preparing maps of areas likely to contain VMEs.

Bottom Fishery Impact Assessment Sections

Throughout the impact assessment sections, consideration may need to be given to how to prepare such sections for fisheries with different development status. New,

exploratory or developing fisheries may require different information, risk assessment or management approaches from developed fisheries.

Specific exploratory fishery assessment requirements adopted by other RFMOs should be reviewed.

- Environmental Risk and Impact Assessment

When evaluating scale and significance of impacts, this needs to be done at a relative scale, relative to the distribution range of the habitats or ecosystems concerned. This will require the units being assessed for risk (e.g. depth ranges, habitats, ecosystems, seamounts) to be explicitly defined when assessing risks.

Criteria to be used to evaluate risks should be independent from one another, such that they provide separate measures of risk. Such criteria should also be quantifiable, preferably with the method of quantification and ranking categories determined beforehand. The proposed measure of Intensity in the current draft is subjective and difficult to measure. Measures of extent will also have to explicitly define what sorts of impacts are being measured, across how many components of the ecosystem, e.g. resident populations only, or larval supply.

In assessing risk, the specific hazards that create the risk, such as gear loss, should be separately identified.

- Proposed Mitigation and Management Measures

It is not the purpose of the standard to prescribe, or even recommend, specific mitigation and management measures, only to guide participants in how to assess risks. Participants are responsible for proposing management measures.

With regard to management measures to ensure sustainability of deep-sea resources, details should be provided both of existing management and mitigation measures in place for the fishery, and new measures that will be implemented. When reviewing assessments, these measures should be evaluated in terms of the extent to which they do mitigate the risks that would exist without such measures.

When designing and proposing management measures, assessments should specifically evaluate and express how such measures will reduce risk. In addition to pre-determined measurement and ranking systems for risks, this will require monitoring to verify that such management reduces risk. During review of assessments, effectiveness of management measures should be determined from the extent to which they are likely or expected to reduce risks.

- Information Gathering and Reporting

Sections on information gathering and reporting throughout the standard should be linked and consolidated.

However, the standard will need to document that bottom fishery data will be required at the highest levels of spatial resolution provided for in the data standards, to assess scale impacts in relation to scale of ecosystems, and to evaluate cumulative impacts.

Amendments to the data standards might be required to specify submission of high resolution data.

Data reporting requirements already covered by data standards should not be specified again in detail, but just referred to. Additional data reporting not covered by data standards (such as VME evidence reporting) will need to be specified in detail in the impact assessment standard, unless incorporated into future amended data standards.

Process for Revising the Draft Assessment

The above list of concerns and suggestions to consider when revising the draft standard, as well as any other suggested improvements, will be considered inter-sessionally by participants, with a view to preparing a revised draft for consideration at the next SWG meeting. A task team consisting of Kelly Denit (USA), Ilona Stobutzki (Australia), Andrew Penney (New Zealand) and Dario Rivas (Chile) agreed to facilitate this inter-sessional process and prepare revised drafts for inter-sessional consideration. This Task Team will be led either by Kelly Denit or Ilona Stobutzki.

8. Deepwater Species Assessment and Management

No papers were tabled for discussion under this agenda item.

New Zealand noted that they were conducting work to evaluate alternatives for proposing precautionary or sustainable catch limits for species such as orange roughy in the SPRFMO area, and hoped to report back on this work at the next meeting. Chile noted their interest in participating in development of approaches for sustainable management of low productivity resources.

9. Other Matters

No other matters were discussed.

10. Adoption of Deepwater Sub-Group Report and Summary

The DWSG report and summary were adopted after inclusion of edits proposed by participants.

GUIDELINES FOR ANNUAL NATIONAL REPORTS TO THE SPRFMO SCIENTIFIC WORKING GROUP

1. Purpose of Annual National Reports

Participants should submit National Reports to the interim Scientific Working Group on an annual basis in order to keep the SWG informed, in a concise format, of their fishing, research and management activities over the previous year.

Such annual reports are not intended to replace data submissions under the Standards for collection, reporting, verification and exchange of data, or submission of detailed scientific papers. Catch and effort data should still be submitted to the SPRFMO Secretariat in accordance with the prescribed data submission standards and procedures. Detailed information or scientific analyses on aspects of fisheries should be presented in specific scientific papers to SWG meetings.

2. National Report Sections

Annual National Reports should include the following sections of specific relevance to the work of the Scientific Working Group:

2.1 Description of Fisheries

A general overview description of the fisheries of the flag state concerned over the previous five years, providing summarised information on:

- Fleet composition (number of vessels by gear type and size) and how this has changed by year.
- Summary tables of effort and total catches by year, gear-type, season and area.
- Brief description of significant changes and new developments in fisheries over the past year.

2.2 Catch, Effort and CPUE Summaries

Overview summary figures of trends in nominal effort, catch and CPUE in the SPRFMO area over the history of the fishery, including:

- Trends in nominal fishing effort by gear type over time.
- Trends in catch by species for the main target, by-catch, associated and dependent species[4].
- Trends in nominal CPUE by gear type for the main species contributing to catches.

2.3 Fisheries Data Collection and Research Activities

Brief description of the fisheries data collection systems implemented, and the research and assessment activities conducted, including:

- Description of the statistical data collection systems in use, and how these have changed or been improved over the past year.
- Description of fisheries sampling programs or surveys conducted, scientific analyses and stock assessments undertaken, or other relevant research activities conducted.
- Information on other SPRFMO-related research activities over the past year.

2.4 Biological Sampling and Length / Age Composition of Catches

- Overview summary of the coverage of biological and size-frequency sampling conducted.
- Simple summary table or figure showing length and age-frequency distribution of the target species by gear, and how this has changed over the past five years.

2.5 Summary of Observer and Port Sampling Programmes

- Brief description of Observer and Port Sampling programmes conducted, and how these have changed or been improved over the past year.
- Information on coverage rates achieved by Observer programmes, or sampling coverage achieved by Port Sampling Programmes, over the past year.

2.6 Implementation of Management Recommendations

- Summary report on actions taken by participants to implement management measures for their fisheries in the SPRMO area.

[4] All species should be reported by scientific names throughout these reports.