

**South Pacific Regional Fisheries Management Organisation:
Interim Science Working Group:
Jack Mackerel Sub-Group**

**Jack Mackerel Stock Structure
and Assessment Workshop**

Santiago, Chile, 30 June – 4 July 2008

Workshop Programme

Background

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 is 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.

In terms of interim measures adopted for pelagic fisheries in the SPRFMO area, the SWG is required 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. It is expected that the results of this workshop will provide the scientific basis for the assessment, and for the provision of advice to SPRFMO in 2009 on the status of jack mackerel stocks. In addition, the workshop will be considering the details of a joint multidisciplinary research programme proposal being developed by a SWG Jack Mackerel Stock Structure Task team to further investigate jack mackerel stock structure in the SPRFMO area. The Workshop is being organized and convened jointly by SPRFMO and the Sub-Secretaría de Pesca, Chile, with the technical assistance of the Food and Agriculture Organization of the United Nations (FAO).

Objectives

The objectives of the workshop are:

- To review all available information on jack mackerel (*T. murphyi*) in the South Pacific and to develop working hypotheses on stock structure of jack mackerel in the region.

- To review available data and information on jack mackerel stock assessments and to agree on data inputs, biological parameters and assumptions to be used in joint assessments of the jack mackerel stock or stocks in light of the working hypotheses developed at the Workshop.
- To review and finalise the multi-disciplinary research project proposal prepared by the Jack Mackerel Stock Structure Task Team.

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 regarding the working hypotheses on the stock structure of jack mackerel in the South Pacific and the data and information available and further research needs for regional stock assessment purposes. It is also expected that, based on the work done by the SWG Jack Mackerel Stock Structure Task team, the Workshop will produce a final draft of a project proposal for testing the working hypotheses on the stock structure of jack mackerel in the region.

Venue and Dates

The workshop will be held from 30 June to 4 July 2008 at the headquarters of the FAO Regional Office for Latin America and the Caribbean:

Dag Hammarskjöld 3241
Vitacura, Santiago, Chile
Telephone: +56 2 33 72 100
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Inputs to the Workshop

In order to meet the proposed objectives and produce the desired results, participants are expected to provide to the meeting data and technical documents supporting their working hypotheses on stock structure, together with a detailed description of the relevant data and information available for stock assessment purposes.

- Participants wishing to contribute to the discussions on stock structure hypotheses should bring actual data and supporting analyses in support of any technical papers they present on jack mackerel stock structure. The workshop will be reviewing relevant data and analyses to reach agreement on plausible jack mackerel stock structure hypotheses.
- The workshop will not be conducting any actual stock assessments, but it will be important to have detailed inventories and descriptions of available data that might be useful to stock assessments. Participants are encouraged to present inventories, descriptions and characterizations of all the data they have, which might be useful to stock assessments. An overview of such data is provided in the attached Annex A.

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 stock structure hypotheses developed at the workshop.

The *T. murphyi* profile that is available on the SPRFMO web pages¹ reflects the current knowledge of the species biology and main fisheries. The technical 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.

The invited independent experts are being requested to contribute keynote presentations on stock structure differentiation and stock assessment work conducted on other similar species.

Prospective participants should provide titles and short abstracts (maximum half a page) of their proposed papers in electronic form by email addressed to Mr Cristian Canales (ccanales@ifop.cl) as soon as possible, 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 to Mr Cristian Canales in electronic form by email by **6 June 2008**, so that contribution can be compiled and circulated to other Working Group participants in advance of the workshop.

Workshop Sessions

In order to assess the available information and data on the stock structure and stock assessment of jack mackerel in the South Pacific Ocean, the Workshop will be organized in working sessions as follows:

Day 1	
Session	1. Opening Session
09h00 - 10h30	1.1 Opening of the Workshop. 1.2 Election of Chairperson and rapporteurs. 1.3 Review and approval of the workshop programme. 1.4 Overview of the objectives of the workshop and aspects to be covered during each session.
2. Jack Mackerel Stock Structure	
11h00 - 12h30	2.1 Keynote presentation on stock structure differentiation in mackerel species. 2.2 Presentation of technical documents regarding jack mackerel stock structure hypotheses.
14h30 - 16h00	2.2 Presentation of technical documents regarding jack mackerel stock structure hypotheses (cont'd).

¹ <http://www.southpacificfmo.org/science-working-group/swg-profiles/species-profiles>

16h30 - 18h00	2.3 Discussion of working hypotheses for South-Pacific jack mackerel stock structure, summarizing supporting evidence for working hypotheses.
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Evening work: Drafting of summary on south Pacific jack mackerel stock structure hypotheses and supporting information by rapporteurs and a drafting group.

Day 2

Session	3. Stock Assessment Data & Surveys
09h00 - 10h30	3.1 Review of report of stock structure working hypotheses and discussion of implications for stock assessment.
11h00 - 12h30	3.2 Presentation and discussion of technical documents regarding stock assessment, input data and surveys.
14h30 - 18h00	3.2 Presentation and discussion of technical documents regarding stock assessment, input data and surveys (cont'd).

Day 3

Session	3. Stock Assessment Data & Surveys
09h00 - 12h30	3.2 Presentation and discussion of technical documents regarding stock assessment, input data and surveys (cont'd).
	4. Stock Assessment Approaches
14h30 - 16h00	4.1 Keynote presentation on stock assessment approaches for similar species. Discussion of alternative stock assessment approaches.
16h30 - 18h00	4.2 Evaluation of available data for use in stock assessments, selection of appropriate assessment methods for these data and specification of inputs to jack mackerel assessments using the proposed method/s.

Day 4 :

Session	4. Stock Assessment Approaches
09h00 - 10h30	4.3 Discussions, conclusions and recommendations on appropriate stock assessment approaches for jack mackerel, including data requirements.
	5. Stock Structure Research Programme
11h00 - 12h30	5.1 Presentation and discussion of draft Jack Mackerel Stock Structure research Programme Proposal by co-conveners of the inter-sessional <i>Jack Mackerel Stock Structure Task Team</i> .
14h30 - 16h00	5.2 Discussion off draft Stock Structure Research Programme Proposal.
16h30 - 18h00	5.3 Discussion off draft Stock Structure Research Programme Proposal and development of final Stock Structure Research Programme Proposal.

Evening work: Drafting of a summary on appropriate stock assessment approaches for Chilean jack mackerel, available data and inputs to such assessments.\

Drafting of final Stock Structure Research Programme Proposal.

Preparation of the draft Workshop Report by rapporteurs and a drafting group.

Day 5

Session	6. Review and Adoption of Workshop Report
09h00 - 10h30	6.1 Presentation of the Report of the Workshop (rapporteurs)
11h00 - 2h30	6.2 Review and Adoption of the Workshop Report. 6.3 Closing of the Workshop

Report of the Workshop

It is expected that the Workshop will produce a technical report with its main findings and recommendations, which could be published by FAO and/or the SPRFMO and be made widely available in both electronic and printed form. It is expected that the Technical Report will include sections on:

- The organization, participation and running of the Workshop.
 - Brief summaries of keynote addresses and key papers presented under each workshop session.
 - A review of biological information and catch-and-effort data relevant to understanding the distribution patterns and stock structure of the jack mackerel in the South Pacific Ocean.
 - Main findings and conclusions regarding working stock structure hypotheses developed at the Workshop, with summaries of the supporting information and scientific rationale supporting these hypotheses.
 - Results of discussions and recommendations on appropriate and robust stock assessment approaches applicable to jack mackerel in the South Pacific Ocean, including methods, underlying assumptions, biological information and catch-and-effort data requirements.
 - Detailed research plan for a Research Programme on jack mackerel stock structure.
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Annex A**INVENTORY OF POTENTIALLY USEFUL DATA FOR JACK MACKEREL STOCK STRUCTURE
DISCUSSION AND STOCK ASSESSMENTS**

The following data are considered to be potentially useful to either stock structure discussions or stock assessments. Workshop participants are particularly requested to bring actual data, analyses and technical summary papers of data relevant to stock structure discrimination.

Participants are requested to provide overviews, descriptions, inventories and characterizations of data relevant to stock assessments.

1. Description of fisheries
 - Location and distribution of the main fishing grounds and landing sites.
 - Types / numbers / sizes of vessels, description of fishing methods, and how these have changed over time.
 - Catch and effort distributions, stratified by month, year and spatial scale (preferably at spatial resolution of 1° or finer).
 - Distribution fishing patterns and jack mackerel catches by month, year and area, including detailed descriptions of density distributions of catches, and how these changes over time (season and years).
2. Jack Mackerel Distribution
 - Information on known distribution of jack mackerel from fisheries-independent surveys or other data sources, including how these distributions have changed over time (seasons and years), and what is known of the size / age structure of fish in different time / area strata.
3. Removals from the Population
 - Jack mackerel catches stratified by fleet, month, year and area (5° block or finer).
 - Estimates of jack mackerel discards in absolute terms or as a percentage of landed catch, seasonal and by fleet and/or type of gear.
4. Catch Size-Frequency and Age-Frequency Distribution
 - Size / Age frequency data and analyses, stratified by fleet, season, year and area (1° or 5° blocks).
 - Data on gear selectivity for the various fleets and historic time periods.
 - Descriptions of the sampling design used to collect data on size / age frequency.
 - Summary descriptions of age determination methods and protocols used to age fish.
5. Biological Information: Weight at size and age
Data and analyses of:
 - Length-weight relationships, how these differ by area, and how these have changed over time.
 - Mean size and weight at age, how these differ by area, and how they have changed over time.

- Detailed descriptions of how fish are measured and weighed: what size intervals are used and what measurements are taken.

6. Biological Information: Sexual maturity, spawning and fecundity

Data and analyses of:

- Maturity classification systems used, including descriptions of gonad staging methods.
- Maturity curves, size and age at maturity for males and females, and how these differ by area, or have changed over time.
- Data and analyses of spawning seasons (proportions of fish in each maturity stage), stratified by month, year and area.
- Identification of spawning areas and Information on how spawning season may differ between spawning areas or years, or has changed over time.
- Data and information on fecundity of fish by age class, and how this may differ between areas.

7. Indices of Abundance

Absolute and/or relative annual abundance indexes (such as CPUE), including detailed description of the methods used, including: sampling design; data standardizations; linearity between the abundance indexes and stock abundance; what portion of the stock is represented by the indexed part of the population (spawning stock, exploitable biomass, recruitment, etc). Indices which may be relevant include those derived from:

- Swept area method (trawl surveys).
- Acoustic surveys.
- Egg surveys (daily egg production method).

8. Environmental Data

- Description of relevant environmental, description of availability of data by month, year and area (1° or 5° squares), and description how these data might be used in assessments.

9. Stock Assessment Models

Presentation of descriptions and results of assessments conducted, including consideration of:

- Fisheries, time periods and areas covered by such assessments.
- Comparative results from age or size structure models, sequential analysis or statistical catch at age (size) models.
- Descriptions of data requirements, assumptions and biological inputs and assessment of uncertainty using proposed modelling approaches.