



TERMS OF REFERENCE (TOR) FOR THE PROVISION OF SCIENTIFIC SERVICES TO SIOFA STOCK AND ECOLOGICAL RISK ASSESSMENT WORK GROUP (SERAWG)

Title: Orange Roughy (*Hoplostethus atlanticus*) Acoustic Data Processing

Project Code: SER2021-01

1. INTRODUCTION

SIOFA Scientific Committee (SC) is tasked to provide management advice for three important species (orange roughy, splendid alfonsino and Patagonian toothfish) to the Meeting of parties of SIOFA. CMM 2020/15 (paragraph 5) requires out that the orange roughy (*Hoplostethus atlanticus*) stocks shall assessed every three to five years.

The first stock assessments of orange roughy were conducted in 2018 and the second full assessments are scheduled to be presented to the fourth SERAWG in March 2022 using the latest available data. In the first assessment, acoustic data were used as the abundance indices and the additional acoustic data needs to be incorporated into the second assessments. Therefore, SIOFA calls for a short-term consultancy to collate and analyse the acoustic data and provide abundance estimates for use in the orange roughy stock assessments.

This document describes the background for the project; and the ToR, work plan, wages, and other administrative matters. Once appointed, the consultant should direct any questions and clarifications to the Executive Secretary (Thierry CLOT, thierry.clot@siofa.org) for administrative matters and to the SERAWG Co-Chair (manager) (Tom NISHIDA, aco20320@par.odn.ne.jp) for the technical matters

2. BACKGROUND

In the first Stock Assessment Working Group (SAWG01, the former name of SERAWG) in 2018, CASAL (an integrated statistical catch-at-age model) (Bull et al. [2012]) was used for the stock assessments by Cordue (2018). Orange roughy were assessed with eight assumed stocks in the SIOFA Area, i.e., (1) WSR (Walters Shoal Region), (2) North Walters, (3) Seamounts, (4) Middle Ridge, (5) Meeting, (6) North Ridge, (7) South

Ridge and (8) West Walters (see Fig. 1). An assessment was conducted for each of the seven stocks (1- 7), but not for (8) West Walters because of low catch levels. The (1) WSR (Walters Shoal Region) stock is the most important as the catch dominates more than 60% of the total catch of orange roughy in SIOFA. Within the (1) WSR stock, six sub stocks were assumed, i.e., five features/sea mounts (spawning areas) and one sub-stock (juvenile habitat area). An assessment was conducted for each of the six sub-stocks. Thus, the total of 12 stock assessments (six sub-stocks within the WSR stock and 6 other stocks) were conducted (Table 1).

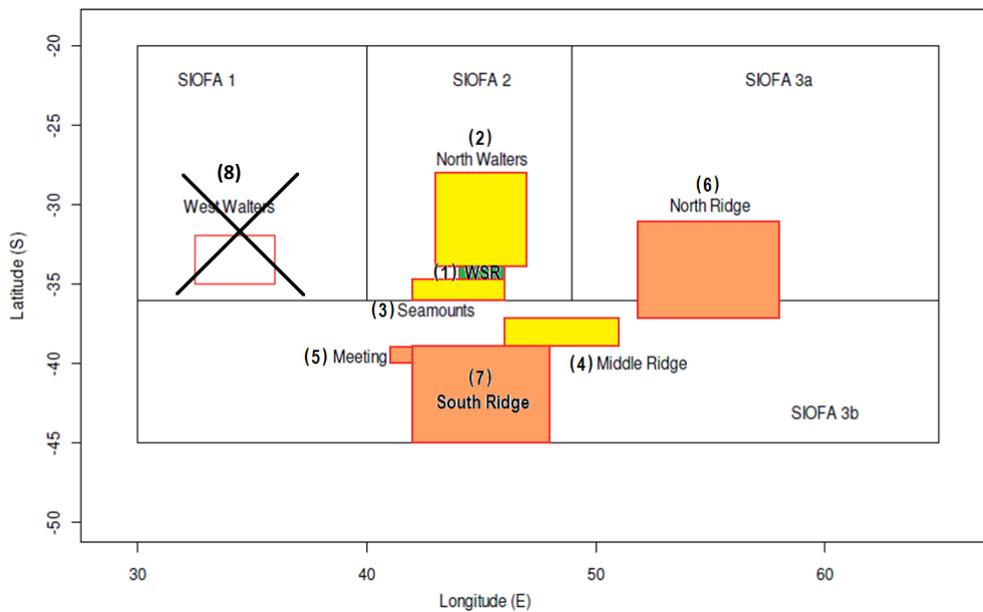


Figure 1. Eight assumed orange roughy stocks in the SIOFA area in the 2018 stock assessments
(*West Walters was not covered as the catch level is very low*)

In the 2018 assessments, the acoustic data (2007-2015) from one trawl vessel (Cook Islands) were available in five sub-stocks within (1) WSR and in the three stocks, i.e., (2) North Walters, (3) Seamounts and (4) Middle Ridge. Quality controlled (QC) acoustic data (see FAO [2017], Scouling & Kloser [2018], and Kloser et al. [2018]) for five sub-stocks in (1) WSR were used for the assessments, while non-QC acoustic data were used for three stocks (2)-(4). One or two years of the good quality data were selected by the QC for each sub-area in WSR as shown Table 1. No acoustic data were available in the sub-stock in the juvenile habitat area in (1) WSR nor in the three other stocks in (5) Meeting, (6) North Ridges and (7) South Ridge (Table 1).

Table 1. Hypothetical orange roughy stock structures and acoustic data used for stock assessments in 2018

8 hypothetical stocks	6 hypothetical sub-stocks (Features/Sea mounts) in WSR, i.e. 5 spawning areas and 1 other (juvenile) area	Acoustic data (2007-2015)	Selected data (years) by the QC in five sub-stocks
(1) WSR (Walters Shoal Region)	1	Partially available	2007 and 2015
	2		2015
	3		2015
	4		2007 and 2009
	5		2009 and 2011
	Other area	Not available	
(2) North Walters	Unknown	Partially available	QC was not conducted
(3) Seamounts			
(4) Middle Ridge		Not available	
(5) Meeting			
(6) North Ridge	Not available		
(7) South Ridge			
(8) West Walters	Unknown	Not available	

3. TERMS OF REFERENCE

ToR 1 Collation of the additional data

Collate additional acoustic data (especially after 2017) from appropriate sources (e.g., vessels that have contributed to the time series of acoustic abundance indices before 2017 or additional vessels that might have adequate data to consider for the quality control process) in the areas in Table 1. Collation of this data will involve the assistance of the SIOFA Secretariat and the Project Manager. And, for all the additional and historical acoustic data, provide a descriptive analysis including sampling periods, locations, attributes, and other relevant information.

ToR 2 Data quality control

Provide an analysis using the data quality control for the additional data collated in ToR 1 using the same techniques applied in 2018 (FAO [2017], Scouling & Kloser [2018], and Kloser et al. [2018]) considering various levels of uncertainty (e.g., species identification, survey design, target strength, absorption, calibration, and other relevant factors). In addition, conduct QC for the acoustic data in (2) North Walters, (3) Seamounts and (4) Middle Ridge, for which QC was not implemented in 2018 (Table 1). If the advanced (improved) QC techniques are used, apply them also to the previous acoustic data to keep consistent quality of the data. For all additional and previously collated acoustic data, make recommendations on the acoustic data that is of sufficient quality for use in the proposed stock assessment updates.

ToR 3 Estimation of the biomass

Using selected good quality of the acoustic data determined in ToR 2, estimate the biomass of orange roughy using the same techniques applied in 2018 (Kloser et al. [2018]). If the advanced (improved) techniques are used, apply them also to the previous estimated data (2018) in the five features from (1) WSR to provide a consistent quality time series of the estimated orange roughy biomass.

4. SOURCE OF INFORMATION (REFERENCES)

Acoustic data process and abundance estimation

- Kloser R.J. and Scouling, B. (CSIRO Australia), Niklitschek, E. and Toledo, P. (ULL Chile) and Patchell, G. (Sealord NZ) (2018) Orange roughy biomass estimation in SIOFA: Review of the use of acoustics from industry vessels (Feb. 2018) by SIOFA-SAWG (2018)-01-INF09.
- Scouling, B. and Kloser, R.J. (CSIRO Australia) (2018) Review of SIOFA orange roughy (*Hoplostethus atlanticus*) acoustic data (Feb. 2018) by SIOFA-SAWG (2018)-01-INF010.
- FAO (2017) Report of the Workshop to review orange roughy acoustic data (FAO-ABNJ-DSP-2017-Doc-02) <http://www.fao.org/3/i7566e/i7566e.pdf>

Stock assessment using the acoustic data

- Bull, B.; Dunn, A.; McKenzie, A.; Gilbert, D.J.; Smith, M.H.; Bian, R.; Fu, D. (2012). CASAL (C++ algorithmic stock assessment laboratory) User Manual v2.30-2012/03/21. NIWA Technical Report 135. National Institute of Water and Atmospheric Research, Wellington, 280 p.
- Cordue P.L. (2014) The 2014 orange roughy stock assessments. New Zealand Fisheries Assessment Report 2014/50. 135 p. New Zealand Ministry for Primary Industries, Wellington, New Zealand. [available as paper SIOFA-SAWG (2018)-01-INFO-04]
- Cordue P.L. (2018) Stock assessment of orange roughy in the Walter's Shoal Region. SIOFA-SAWG (2018)-01-05. March 2018, La Reunion.
- Cordue P.L. (2018) Assessments of orange roughy stocks in SIOFA statistical areas 1, 2, 3a, and 3b. SIOFA-SAWG (2018)-01-06. March 2018, La Reunion.

(Note: Other relevant references are available in the references list in each document)

5. SUBMISSION OF THE INFORMATION AND CONFIDENTIALITY

The Consultant shall submit all the information collected to the SIOFA Secretariat (including that sourced from the Secretariat) before the final payment of the contract is made to the consultant. Such information includes electronic data files, analysis codes, biological samples and other relevant data if applicable. Any arrangements for ownership, storage, or disposal of physical samples shall be agreed by SIOFA as a part of the contract. All Intellectual Property generated as a part of this contract shall become the property of SIOFA unless otherwise excluded in the proposal and agreed by SIOFA in the contract. The consultant shall not release confidential data provided for conducting this study to any persons nor any organisations, other than SIOFA Secretariat. The consultant shall delete all the confidential data upon the completion of the contract.

6. REPORTS

The Consultant shall make at least one report for each of ToR 1, ToR 2 and ToR3, and present the reports to the SERAWG of SIOFA, and include the following items if applicable:

- Detailed descriptions of the information collated and analysed;
- Data catalogue (inventory) of the information collated;
- Maps, Figures, Tables, Pictures, Diagrams and Illustrations as much as possible for anyone to understand contents easily;
- Methods and detailed descriptions of analyses in a manner that allows for scientific review and scientific reproducibility;
- Location and access for any data collection (datasets) that are produced from this project;
- Advice and recommendations on future work; and
- Executive summary.

Refer to “8. work plan” on the report submission schedule.

7. SUBMISSION OF APPLICATION

The applicants should have experience in the analysis of orange roughy acoustic data, acoustic data processing, quality control, and estimation of abundance from industry vessel collected acoustic data. If these conditions are satisfied, then follow the next steps to apply this consultancy:

The applicant(s) should submit a proposal that contains the following items:

- An current CV that summarises the applicant(s) relevant educational background and professional experience;
- A brief proposal outlining the proposed methods and analyses, including a description of how the objectives of the ToR will be achieved;
- Any proposed exclusions to the intellectual property clause;
- Identification of any project risks and associated mitigation and management required to successfully complete the project;
- A statement that identifies any perceived, potential, or actual conflicts of interest of the applicant(s), including those described in paragraph 4 of the SIOFA recruitment procedure (see Box 1 below); and
- Any additional information the applicant(s) wish to submit.

Box 1. Recruitment Procedure: Paragraph 4 on conflict of interests

4. To ensure that situations relating to potential and actual conflict of interests are avoided, persons falling into the following categories may not normally be considered for SIOFA consultancy:

- i. any person designated as a designated representative or alternate representative of a CCP to the Meeting of Parties (MOP) as per Rule 3.1 of the Rules of Procedure, and to the SC and any other subsidiary bodies of the MOP, as per Rule 21.3 of the Rules of Procedure;
- ii. any person fulfilling the function of Chair or Vice-Chair of the MOP or Chair or Vice-Chair of a SIOFA subsidiary body or working group;
- iii. any person acting as a member of a delegation involved in the SIOFA decision-making process resulting in recommendations and/or approval for the SIOFA work requiring the engagement of a consultant; and
- iv. individuals who were SIOFA Secretariat staff members at the time when the recommendations and/or approval for the SIOFA works were adopted or who are members of immediate family (e.g., spouse or partner, father, mother, son, daughter, brother, or sister) of any Secretariat staff member or of the persons identified in 4 (i), (ii), and (iii).

Announcement of Call for the consultant will be placed in the SIOFA home page in April 2021 and will be circulated to all Cooperating and Contacting Parties (CCPs).

The application must be submitted to Thierry Clot, Executive Secretary (Thierry.clot@siofa.org) by Monday **24 May 2021** (1pm UTC time).

8. WORK PLAN AND PAYMENT SCHEDULE

Table 3 describes the work plan and the payment schedule. The consultant shall follow this work plan.

Table 3 Work plan and the payment schedule (maximum payment: EURO 20,000)

Work Period	ToR (See page 3)	Activities
April/14–May/24 (2021)		<ul style="list-style-type: none"> ● Call for the consultant through the SIOFA web site and also through the circulation to Cooperating and Contacting Parties (CCPs) (3 weeks).
May/25–30 (2021)		<ul style="list-style-type: none"> ● Selection of the consultant by Secretariat in consultation with the Project Manager and others included in the evaluation panel.
June/1–July/31 (2021)	ToR1 Data Collation	<ul style="list-style-type: none"> ● Collate the additional acoustic data with the assistants by the Secretariat and the manger and make a summary of the collected data. ● Submit a draft report to Project Manager and SC Chairperson by July/15/2021. ● Review of the draft report by SC heads of delegations. Requests for additional works and/or revisions will be provided to the consultant then the consultant shall complete the final report by July/31/2021; and ● After the final report is received and validated by the Project Manager, the Secretariat will pay 20% (EURO 4,000) to the consultant by Aug/10/2021.
Aug/1–Oct/15 (2021)	ToR 2 Data QC	<ul style="list-style-type: none"> ● Conduct the data QC and select good quality data; ● Submit a draft report to Project Manager and SC Chairperson by Oct/1/2021; ● Review of the draft report by SC heads of delegations. Requests for additional works and/or revisions will be provided to the consultant then the consultant shall complete the final report by Oct/15/2021; and ● After the final report is received and validated by the Project Manager, the Secretariat will pay 45% (EURO 9,000) to the consultant by Oct/25/2021.
Oct/16–Nov/15 (2021)	ToR 3 Estimation of biomass	<ul style="list-style-type: none"> ● Estimate biomass for the selected good acoustic data and submit a draft report to Project Manager and SC Chairperson by Nov/1/2021; ● Review of the draft report by SC heads of delegations. Requests for additional works and/or revisions will be provided to the consultant then the consultant shall complete the final report by Nov/15/2021; and ● After the final report is received and validated by the Project Manager, the Secretariat will pay 25% (EURO 5,000) to the consultant by Nov/25/2021.
3/1–3/20 (2022)		<ul style="list-style-type: none"> ● Present the reports during SERA-WG4. If SERA-WG4 is the face to face meeting, the travel related costs will be covered. ● After the presentation is completed, the Secretariat will pay 10% (EURO 2,000) to the consultant by 3/31/2022.

9. CONTACT PERSONS

SIOFA Secretariat (administrative matters)

Thierry Clot, SIOFA Executive Secretary (thierry.clot@siofa.org)

Project Manager (technical matters)

Tom Nishida, SERAWG chairperson (aco20320@par.odn.ne.jp)

10. EVALUATION CRITERIA FOR THE SELECTION OF CANDIDATES

The selection criteria will be developed by the evaluation panel along with the project manager, the Secretariat and the Chairpersons of the relevant subsidiary bodies. The criteria may include following items:

- Adequate submission of information to allow the panel to evaluate the candidate;
- Evaluation of the proposal from the candidate;
- Ability to undertake and complete the analyses or work required in the ToR;
- The candidate's agreement with confidentiality provisions required for the project;
- Acceptable conflict of interest statement;
- Agreement with the data submission and intellectual property terms required in this ToR; and
- Financial and resourcing considerations.