

## 10<sup>TH</sup> MEETING OF THE SPRFMO COMMISSION

*Held virtually, 24 to 28 January 2022 (NZDT)*

### COMM 10 – Report ANNEX 4a 2022 Scientific Committee Multi-Annual Plan (COMM 10 – Doc 06\_rev2)

#### 1. Introduction

Paragraph 30 of the 9th Scientific Committee Meeting Report notes that the SC would develop the 2022 workplan during the sessions. Within each session there was a sub-agenda item *Advice to the Commission* that served to allocate time to develop relevant workplan tasks for the coming years. This approach differed from that taken in 2020 where the Secretariat coordinated a small intersessional working group to develop the work plan prior to COMM9. The workplan was largely crafted via email correspondence after the 8<sup>th</sup> Scientific Committee meeting. In contrast, this year the SC developed the workplan within the meeting sessions; an approach that proved productive and well received. This report summarizes results from those activities.

The following tables are meant to track priority tasks with timelines. The year noted is the Scientific Committee meeting at which the work is expected to be reported back. In some cases, the work is expected to be repeated over a number of years, and this is indicated with a plus sign. The column labelled “Coordinator” identifies the Member(s) (or in some cases the Secretariat or Chair) who has specifically been assigned to ensure that progress towards the task is made intersessionally. In some cases, no Member has been specifically identified and this is indicated with a blank. The funding required is identified, and funding sources (such as the SC Scientific Support Fund or a Member voluntary contribution) if this is known. A notation of “In-kind” signifies that the work will be conducted by Members and that no additional funding is expected to be required.

Awaiting input from As reviewed and approved from COMM10, the recommendations to the SC for their multi-annual work plan are as follows:

#### 2. Jack Mackerel Working Group

Task	Subtask	Timeline	Coordinator	Funding
Jack mackerel assessment data	Review available input data JM assessment	2022	US/EU	In-kind
	Finalize development of quality control diagnostics of the catch input data to the assessment	2022	EU	In-kind
	Evaluate the impact of revisions in age determinations on the assessment of Jack mackerel ( <i>benchmark</i> )	2021-2022	EU	In-kind
	Update and compare standardizations of commercial tuning indices among different fleets and review the potential bias in CPUE indices due to possible increased efficiency of the fleet and observed changes in the jack mackerel spatial distribution ( <i>benchmark</i> )	2022		In-kind
	Explore availability of different survey time series for the Jack mackerel assessment ( <i>benchmark</i> )	2022	Chile	In-kind
	Develop protocol for inclusion of industry self-sampling or acoustic data in the JM assessment ( <i>benchmark</i> )	2022	EU	In-kind



Task	Subtask	Timeline	Coordinator	Funding
Jack mackerel assessment	SC and other funds to support experts during benchmark and SC assessment	2021+	SC Chair/ Secretariat	NZ\$10K (SC)
	Provide TAC advice according to Commission request (“adjusted Annex K”)	2022		In-kind
	Software upgrade to JJM model (upgrade diagnostics, explore embedding in FLR) (3-day online workshop/ capacity building)	2022		NZ\$8K (SC)
	A Jack mackerel stock assessment <i>benchmark workshop in the first half of 2022</i> to cover topics such as updated growth estimates, standardized CPUE modelling and a review of the single and two-stock hypothesis implementations of the JJM assessment model and estimation of reference points.	2022	EU	NZ\$42K (EU)
	<i>MSE objectives workshop</i> with stakeholders or managers in second half of 2022	2022 (or 2023)	EU	NZ\$50K (EU)
	Develop and carry out MSE evaluation to design alternative management procedures (see COMM8-Report Annex 8b). This to include biological reference points, carryover, accumulating quota over 2 years, and stock hypotheses (paragraphs 80, 102,118 COMM8-Report).	2022- 2023	EU	Pending
Jack mackerel connectivity research	Task group on CJM connectivity to improve the understanding of origin and admixture of populations or subpopulations of jack mackerel in the Southern Pacific. Genetic research will be an important element in such a research plan, next to, where possible, additional information from e.g., morphometry, parasites, hard parts microchemistry, life history patterns, food habits, spatiotemporal diet variability, distribution patterns and habitat preferences.	2022- 2026	Chile Peru EU?	Sources TBD  Total NZ\$150K/ year
Jack mackerel ageing techniques	Task group on CJM ageing analysis and otolith exchange to addresses the current practices in ageing of Jack mackerel, the validation techniques to verify ages, an otolith exchange program and a comprehensive documentation of ageing techniques and protocols.	2022- 2024	Chile Peru EU?	Sources TBD  Total NZ\$75K/ year

### 3. Deepwater Working Group

Task	Subtask	Timeline	Coord.	Funding
Orange roughy assessment	Louisville Ridge stock(s): <ul style="list-style-type: none"> <li>Explore alternative stock assessment models</li> <li>Estimate stock status</li> <li>Provide advice on sustainable catch levels</li> <li>Lord Howe Rise stock assessment update, including new age data</li> <li><a href="#">West Norfolk stock assessment update</a></li> <li><a href="#">Louisville: Update existing assessments</a></li> </ul>	2022	NZ	In-kind
Orange roughy assessment data	Coordinate and design acoustic surveys for relevant stocks ( <i>intersessional consideration</i> )	2022+	NZ	In-kind
Deep water stock structure	Review the list for deepwater stock structure analyses based on assessment for non-orange roughy stocks	2025		In-kind
	Develop workplan to drive stock structure delineation studies for orange roughy and alfonso and other key target species	2022+		In-kind
Other stock assessments, & ecological risk assessment	Review the risk assessment of teleost and elasmobranch species considering new available information and methods	2024- 2025		In-kind



Task	Subtask	Timeline	Coord.	Funding
	Develop a tier-based assessment framework for all DW stocks and recommend relevant reference points and/or management rules for these stocks	2022+		In-kind
VME Encounters and benthic bycatch	Annually collect and review VME catch and other benthic sampling data	2022+		In-kind
	Develop VME taxa ID guide for benthic bycatch, following the steps proposed in SC9-DW12, and associated training videos	2022+	NZ	In-kind
	Investigate the relationship between benthic bycatch from fishing vessels (including encounter events) and the habitat suitability models	2022+		In-kind
	Investigate the relationship of benthic bycatch to abundance models of VME taxa	2022+		In-kind
VME Encounters and benthic bycatch	Development of a process to review all recent and historical benthic bycatch data to determine the ongoing effectiveness of the spatial management measures	2022+		
	Investigate catchability of benthic bycatch using existing data to support design of a wider research programme ( <i>see next task</i> )	2022+	NZ	
	Develop a research programme within the SPRFMO Convention Area to allow the determination of taxon-specific estimates of catchability for VME indicator taxa. ( <i>The total cost for such a programme will need to be determined. The two amounts indicated will be used to commence the programme</i> ).	2023+	NZ	NZ\$58K (AUS) NZ\$23.6K (SC)
CMM 03 request regarding Encounters with VMEs	Review all reported VME encounters	2022+		In-kind
CMM 03 request regarding ongoing appropriateness	Review all available data and provide advice on the ongoing appropriateness of the management measures to ensure the CMM continues to achieve its objective and the objectives of the Convention	2022+		In-kind
Bottom Fishery Impact Assessment	Consider any possible changes to BFIAS adopted in 2019 in the light of the cumulative BFIA done in 2020.	2022		In-kind
	Develop abundance models for VME taxa	2022+	NZ	In-kind
	Work to reduce uncertainties in risk assessments for benthic habitats and VMEs	2022+		In-kind
CMM 03 request regarding Marine mammals, seabirds, reptiles and other species of concern.	The Scientific Committee shall provide advice biennially to the Commission on:	2022		In-kind
	• Direct and indirect interactions between bottom fishing and marine mammals, seabirds, reptiles and other species of concern;	2024		
	• Any recommended spatial or temporal closures or spatially/temporally limited gear prohibitions for any identified hotspots of these species; and • Any recommended bycatch limits and/or measures for an encounter protocol for any of these species.	2026		



#### 4. Squid Working Group

Task	Subtask	Timeline	Coordinator	Funding
Squid workshop	Squid Workshop including potential assessment techniques and appropriate measures of fishing effort ( <i>prior to SC10</i> )	2022	SQWG Chair/ Secretariat	NZ\$10K (SC)
Squid assessment and CMM development	Develop a plan for more detailed within-season fishery monitoring	2022	SQ WG	In-kind
	Develop and present alternative assessment approaches	2022+	SQ WG	In-kind
	Design and evaluate MSE and harvest control rules	2023+	SQ WG	In-kind
Standardise biological sampling	Identify where protocols differ e.g. type of sampling, areas and timing of sampling, ageing	2022	Peru, Chile	In kind
Observer Coverage	Review minimum observer coverage (including in relation to different fleet segments, CMM18-2020)	2023		In kind
	<a href="#">Provide advice to COMM11 on the appropriate level of observer coverage in the Jumbo Flying Squid fishery.”</a>	<a href="#">2022</a>		
Squid assessment data	Sample biological information year-round in its entire distribution area	2022		In-kind
	Record and analyse diet data	2022		In-kind
	Review on the acoustic surveys for Squid biomass estimation (pros, cons, challenges)	2022		In-kind
	Evaluate stock structure and assessment approaches applicable to stocks found in the SPRFMO area throughout their entire range ( <i>potential benchmark workshop</i> )	2022		In-kind
	Determination of the necessary data for the models for stock evaluation (revision of templates 2020 or others)	2022		In-kind
Squid connectivity	Collect and analyse genetic samplings (Convention area and adjacent National Jurisdiction Areas)	2022		NZ\$36K (China)
	Sample exchange where Members choose to do	2022+		In-kind
	Register DNA sequences in public DNA databases (such as GenBank), considering a list of metadata related to samples analysed (using the template in the SC9-Report).	2022		In-kind
	Description of genetic diversity based on mtDNA markers, integrating data from all members	2022		In-kind
	Reaching an updated agreement on consistent approaches to genetic analyses for Jumbo flying squid (SNPs) Sample exchange where Members choose to do so.	2022		In-kind
	Use modelling and observation data to predict connectivity and seasonal to decadal variability possibly using genetic, microchemistry, morphometric, parasite prevalence, and tagging experiments	2022+		In-kind

#### 5. Habitat Monitoring Working Group

Task	Subtask	Timeline	Coord.	Funding
Evaluate the applicability of data collected from fishing vessels targeting	Mapping spatial-temporal population density distribution of jack mackerel using a combination of the existing acoustic survey data and acoustic information as obtained from industry vessels	2022+	Peru/Chile	In-kind
	Subgroup of specialists to evaluate advantages and biases of analysis methods (1) Draft of ToR and intersessional work, December 2021. (2) Workshop for testing different assessment methods on a common data base ( <i>prior to SC10</i> ).	2022	Peru/Chile	In-kind



Task	Subtask	Timeline	Coord.	Funding
pelagic species	Subgroup of specialists to organise classification of fishing fleets and develop an inventory of technologies available aboard fishing vessels to identify the potential to collect data using the technologies currently being deployed (1) Draft of ToR and intersessional work, December 2021. (2) Draft of proposal to SC on classification of fishing vessels. (3) Draft of proposal on the use of sonars for marine ecosystem studies.	2022	Peru/Chile	In-kind
Development of standardised oceanographic data products/modelling	Characterise jack mackerel habitat (e.g., past studies done in Peru and Chile)	2023	Peru/Chile	In-kind
	Provide ecosystem status overview for SC at seasonal to decadal scale	2024	Peru/Chile	In-kind
Habitat monitoring	Review the state of the art of habitat research in order to recommend specific lines of investigation in this topic within the framework of the SPRFMO	2022	Peru/Chile	In-kind
	Explore the concept of jack mackerel habitat under an interdisciplinary ontogeny approach for jack mackerel and other species (by life history stages and regions). <i>Workshop to be conducted during 2021/22.</i>	2021+	Peru/Chile	In-kind
	Define a list of existing environmental data: satellite, acoustic surveys, acoustic fisheries surveys, fishing data, fishing vessel data (VMS, Observers) in time and space that already exist inside the SPRFMO area	2022+	Peru/Chile	In-kind
	Integration of databases provided by different members of the HMWG and other working groups of the SC with linkage to a metadata repository	2022+	Peru/Chile	In-kind
	Develop an inventory of research programmes being developed by industry and scientific institutions regarding data collection and monitoring of marine habitats	2022	Peru/Chile	In-kind
Species behaviour and preferences	Analyse the habitat preferences of jumbo squid and Jack mackerel, noting the useful data and analyses provided by Peru and Chile	2023	Peru/Chile	In-kind
	Habitat suitability modelling of Jack Mackerel	2022+	Peru/Chile	In-kind
	Incorporate behaviour, distribution, and abundance information about mesopelagic, euphausiids and other key species of the Humboldt Current System	2022+	Peru/Chile	In-kind
Use of new Tools	Develop new approaches based on different tools such as GAM, GLM, INLA, ROMS, Biogeochemical, Geostatistics, big data and machine learning (e.g. for acoustic classification of targets) and utilisation of different platforms.	2022+	Peru/Chile	In-kind
2022 Symposium	Symposium on Habitat Monitoring prior to the 2023 meeting of the Commission to review the state of the art of habitat research in order to recommend specific lines of investigation in this topic within the framework of the SPRFMO	2022	Chile/Peru	NZ\$63K (SC)



## 6. Other (Crosscutting issues)

Task	Subtask	Timeline	Coord.	Funding
Observer programme	Advise on the appropriate levels of observer coverage for each of the major fisheries to: <ul style="list-style-type: none"> <li>Identify bycatch issues related to seabirds and other species of concern (short and medium term)</li> <li>Provide statistically robust quantitative estimates for all species of seabird combined and some of the more common bycatch species (medium term)</li> <li>Periodically review the appropriate levels of observer coverage for SPRFMO fisheries in support of stock assessment needs.</li> </ul>	2022+		In-kind
Seabird / bycatch monitoring	Progress southern hemisphere quantitative risk assessment (SEFRA)	2022+		In-kind
EBSA	Evaluate impacts of fishing activities	2022+		In-kind
CMM 17 Marine pollution	SC Members and CNCPs are encouraged to undertake research into marine pollution related to fisheries in the SPRFMO Convention Area to further develop and refine measures to reduce marine pollution and are encouraged to submit to the SC and the CTC any information derived from such efforts	2022+		In-kind
Climate change	Identify key area and management implications of climate change on VMEs and main fisheries in the SPRFMO area	2022+		In-kind
CMM02-2020 Data Standards	Review and update data standards to ensure appropriate scientific data are collected in SPRFMO fisheries (Paragraph 8 of CMM02-2020)	2022+		In-kind
FAO ABNJ Deep Sea Fisheries Project	Planning phase has been completed, the SC supports Secretariat involvement in coordinating activities over their next five-year plan that could involve member scientists and a number of SPRFMO science projects	2022+	Secretariat	In-kind
Alignment	Work involving the alignment of Deepwater and Habitat Monitoring workstreams	2022+		In-kind
Intersessional meetings	External support for the planning and execution of SC intersessional webmeetings and workshops	2022	SC Chair	NZ\$10K (SC)
Species synopses	To update long version profiles (FAO species synopsis format) for jack mackerel, chub mackerel and jumbo flying squid	2022+		
Research in the Nazca and Salas y Gomez ridges area	Identification of the area, by comparing of biodiversity, ecological significance and fishing effort.	2022	Chile	In-kind
	Summary of existing management measures in adjacent Chilean MPAs	2022	Chile	In-kind
	Research cruises aimed to know the bio-oceanographic and meteorologic characteristics of Salas y Gomez ridge; as well as biodiversity, current circulation, morphology and geology of sea bottom.	2023-2024	Chile	In-kind
	Climate change impacts of fisheries in Salas y Gomez and Nazca ridges	2023	Chile	In-kind
	Expedition to Salas y Gomez and Nazca aboard oceanographic research vessel	2023-2025 (TBD)	Chile	In-kind
<a href="#">Research on catch composition</a>	<ul style="list-style-type: none"> <li><a href="#">Evaluate patterns in species catch composition, including at the 'tow by tow' level and any other historical catches of alfonsino within FAO Area 87 with the SPRFMO area.</a></li> <li><a href="#">Analysis must include an evaluation of Russian Federation-flagged vessel(s).</a></li> </ul>	2022	TBD	