

CMM 16-2023

Conservation and Management Measure Establishing the SPRFMO Observer Programme

(Supersedes CMM 16-2022)

The Commission of the South Pacific Regional Fisheries Management Organisation;

RECOGNISING United Nations General Assembly Sustainable Fisheries Resolutions 63/112 and 71/123 which encourage the development of observer programmes by regional fisheries management organisations (RFMOs) and arrangements to improve data collection;

RECALLING that, according to Article 28 of the Convention on the Conservation and Management of High Seas Fishery Resources in the South Pacific Ocean (the Convention), the Commission shall establish an observer programme, to be operated in accordance with standards, rules and procedures developed by the Commission;

NOTING that Article 28 of the Convention sets out the functions of the observer programme and that the observer programme shall be coordinated by the Secretariat of the Commission in a flexible manner to take account of the nature of the fisheries resources and other relevant factors;

NOTING that the primary function of observers on board fishing vessels is the collection of scientific information and that observers are not enforcement officials, but that Article 28 of the Convention specifies that the information collected by the observer programme shall, as appropriate, also be used to support the functions of the Commission and its subsidiary bodies, including the Compliance and Technical Committee (CTC);

NOTING the importance of the collection of robust scientific information, consideration should be given to *inter alia* cost-effectiveness and safety at sea;

NOTING that Article 19(2)(b) of the Convention stresses the need to avoid adverse impacts on, and ensure access to fisheries by, subsistence, small-scale and artisanal fishers and women fish workers when establishing CMMs for fishery resources covered by the Convention;

NOTING ALSO that one of the functions of the Commission is to promote the conduct of scientific research to improve knowledge of fishery resources and marine ecosystems in the Convention Area and of the same fishery resources in adjacent waters under national jurisdiction;

NOTING FURTHER that scientific research vessels performing fishing operations for research purposes will have on board scientific personnel whose primary function is the collection of scientific data and information;

ACKNOWLEDGING that high-quality data and information related to the fishing activity in the Convention Area, and its impacts on the marine environment occurring in the SPRFMO area are essential for the Commission to adopt and implement effective and timely Conservation and Management Measures (CMMs);

DETERMINED to ensure the collection of data and information that can be used for effective assessment and management of SPRFMO fisheries resources, including target species and bycatch, and interaction of fishing activities with the environment and species occurring in the Convention Area, to improve the certainty of future scientific advice while taking into account ecosystem considerations;

RECOGNISING the international nature of fishing activity and management of SPRFMO fisheries resources, and the consequent need to deploy well-trained and accredited observers;

RECOGNISING the nature of the observer's work at sea and that the collection of data and information needs to be coupled with safe conditions for observers while on board fishing vessels;



ACKNOWLEDGING that electronic monitoring systems, study fleets and self-sampling have been successfully tested for certain types of data in some fisheries and that the Commission, with the advice of the Scientific Committee (SC), could explore minimum standards for their implementation, as practical and appropriate;

COMMITTED to ensure that the SPRFMO Observer Programme (SPRFMO OP) is developed under a robust and transparent governance framework;

RECOGNISING the need to establish clear procedures for attaining accreditation of national observer programmes and service providers under the SPRFMO OP;

ADOPTS the following CMM in accordance with Articles 8 and 28 of the Convention:

General Rules

1. This CMM establishes the standards, rules and procedures to establish the SPRFMO OP and to ensure it achieves the objectives specified in Article 28 of the Convention.
2. The purpose of the SPRFMO OP is to facilitate the collection of verified scientific data and additional information related to fishing activities in the Convention Area and its impacts on the ecosystem, and also to support the functions of the Commission and its subsidiary bodies, including the CTC.
3. The SPRFMO OP shall apply to all fishing vessels flying the flag of a Member or Cooperating non-Contracting Party (CNCP) fishing for fisheries resources in the Convention Area for which a minimum level of observer coverage applies in the relevant CMMs in force.
4. Notwithstanding paragraph 3 above, for artisanal fishing vessels less than 15 metres from coastal developing States fishing for jumbo flying squid, a coastal developing State will employ an alternative scientific monitoring programme such as the Annex 4¹ that will collect data equivalent to that specified in this Observer Programme and in CMM 18-2023 (Squid), in a manner that ensures comparable coverage. In any such cases, the Member or CNCP wishing to avail itself of an alternative programme must present the details of the programme to the Scientific Committee for evaluation. The Scientific Committee will advise the Commission on the suitability of the alternative programme for carrying out the data collection obligations set forth in this Observer Programme and in CMM 18-2023 (Squid). Alternative programme implemented pursuant to this provision shall be subject to the approval of the Commission at the annual meeting prior to implementation. Once the alternative programme has been approved, the coastal developing State will notify the Commission prior to the start of their fishing operations. This derogation does not extend to any other obligations contained in this or other CMMs in force. This exception will be revised by the Commission in 2026. Unless otherwise decided by the Commission, this derogation will expire on 1 January 2026.
5. Members and CNCPs are encouraged to undertake their best efforts to have observers on board their fishing vessels² flying their flags and fishing for fisheries resources in the Convention Area for which there is no fishery-specific CMM in force. The Scientific Committee shall provide advice to the 8th meeting of the Commission in 2020 on the appropriate levels of observer coverage for these fisheries.
6. Observers shall have the rights and duties set out in Annex 1 of this CMM. Members and CNCPs shall ensure that observers from national observer programme or alternative programme perform their duties.
7. Members and CNCPs shall also ensure that owners and fishing operators, vessel captains, officers and crew of vessels flying their flag:
 - a) Respect the rights of observers set out in Annex 1 of this CMM, and
 - b) comply with the standards and duties set out in Annex 2 of this CMM.

¹ For that purpose, over a period of two years, the Annex 4 will be subject to change in order to fit its provisions into the relevant CMMs.

² For the purposes of this paragraph, fishing vessels exclude reefer and supply vessels.



8. Members and CNCPs shall ensure that their national observer programmes and service providers only deploy independent and impartial observers.
9. The Commission, based on the advice of the SC, should explore and, where feasible, complementary with other means of collecting scientific data and additional information in conjunction with human observers.

Deployment of Observers

10. To fulfil their obligations under the Convention and the relevant CMMs adopted by the Commission, Members and CNCPs shall only deploy observers sourced from a national observer programme or service provider accredited according to the provisions of this CMM.
11. Observers from an accredited observer programme or alternative programme of a Member or CNCP shall only be deployed on board vessels flagged to another Member or CNCP with the consent of both Members or CNCPs.
12. Individual observers have the right to refuse a deployment on board a fishing vessel for justified reasons, including when safety issues have been identified on the vessel to be deployed or due to serious illness of the observer before boarding. The national observer programme or service provider shall ensure that the reasons for such refusal are documented and that a copy of such documentation is provided to the SPRFMO Secretariat, which will forward it to the relevant Member or CNCP.

Levels of Coverage

13. Members and CNCPs shall ensure that all fishing vessels flying their flag carry observers from either a national observer programme, alternative programme or service provider accredited under the SPRFMO OP to meet the minimum levels of observer coverage required by the relevant applicable SPRFMO CMM(s) while operating in the Convention Area³.
14. Scientific research vessels flying the flag of a Member or CNCP fishing for research purposes in the Convention Area shall be exempted from the obligation to carry accredited observers on board⁴. In these cases, Members and CNCPs shall comply with the data collection and reporting obligations of paragraphs 44, 45 and 46, and shall ensure that scientific personnel on board possess the capacity to perform in full all of the observation and reporting responsibilities contained in those paragraphs.
15. For fisheries where 100 percent of observer coverage is not required, Members and CNCPs shall ensure that the method of assigning observers on vessels flying their flag is representative for the fishery to be monitored and commensurate with the specific data needs of the fishery as a whole. This requirement is subject to practical constraints related to Members and CNCPs with a small number of fishing vessels or trips.
16. In relation to paragraph 15 of this CMM, Members and CNCPs shall document and provide information on the methods used to allocate observers on fishing vessels flying their flag to meet the observer coverage requirements, and shall also provide this information in their National Annual Report to the SC. The SC shall review the method used by each Member or CNCP and provide recommendations for improvement, when necessary.

³ CMM 01-2023 (*Trachurus murphyi*), CMM 03-2023 (Bottom fishing), CMM 13-2021 (Exploratory fisheries) and CMM 18-2023 (Jumbo flying squid) specify observer coverage levels for these fisheries.

⁴ This paragraph does not apply to fishing under CMM 13-2021 (Exploratory Fisheries) - observer requirements for exploratory fishing are specified under paragraph 20 of that CMM.



Accreditation

Accreditation Evaluator

17. The SPRFMO OP Accreditation Evaluator is the public or private person or entity tasked by the Commission to assess and evaluate the applications for accreditation. The SPRFMO OP Accreditation Evaluator shall have addressed any potential or actual conflict of interest in the course of delivering its service.
18. Applications for the accreditation of national observer programmes may be submitted by Members or CNCPs while applications by service providers may be submitted directly by an external, non-governmental provider of observers, or a Member or CNCP under the SPRFMO OP. Subject to paragraphs 36 and 38 of this CMM, the evaluation of each national observer programme or service provider shall only be undertaken by the SPRFMO OP Accreditation Evaluator.
19. Subject to paragraphs 29, 30 and 31 of this CMM, the SPRFMO OP Accreditation Evaluator shall evaluate the national observer programmes and service providers against the minimum requirements and standards set by the Commission in Annex 3 of this CMM.
20. The Secretariat shall ensure that the SPRFMO OP Accreditation Evaluator is required, through its service contract, to maintain the confidentiality of any information received by a Member, CNCP or service provider pursuant to this accreditation process.
21. A Decision of the Commission will designate a SPRFMO OP Accreditation Evaluator no later than at its 8th annual meeting. The procedure for appointing the SPRFMO OP Accreditation Evaluator, as well as the terms and conditions of engagement, are outlined in COMM7-Report Annex 7i.
22. The SPRFMO OP Accreditation Evaluator shall be paid out of the Commission budget.

Evaluation of Observer Programmes of Members, CNCPs and Service Providers by the SPRFMO OP Accreditation Evaluator

23. Consistent with Article 28(1) of the Convention, the SPRFMO OP, including the accreditation process, shall be coordinated by the Secretariat and operated in accordance with the standards, rules and procedures detailed in this CMM.
24. Each Member, CNCP or service provider seeking to accredit its observer programme under the SPRFMO OP shall submit to the Secretariat and the Accreditation Evaluator, at any time, all the relevant information and documentation to fulfil the standards provided for in Annex 3, including manuals, guides and training materials. Where applications are submitted by service providers on behalf of a Member or CNCP, final responsibility for the completeness and accuracy of the information submitted shall rest with the Member or CNCP. All the information and documentation shall be provided in the official language of the Commission or with appropriate translations. The Secretariat may recommend that the Member, CNCP or service provider complete the application when there is clear evidence that substantive or essential information is missing.
25. Members and CNCPs are encouraged to inform the Secretariat and the Accreditation Evaluator a year in advance of their intention to pursue accreditation under the SPRFMO OP and to commence the accreditation process at least six months prior to the date fixed for the opening of the next Commission meeting.
26. The Secretariat shall promptly provide the information and documentation referred to in paragraph 24 to the SPRFMO OP Accreditation Evaluator.



27. The SPRFMO OP Accreditation Evaluator shall liaise with Members, CNCP and service providers, as appropriate. Members, CNCPs and service providers shall have the opportunity to provide additional information and corrections relevant to their evaluation to the Secretariat and the Accreditation Evaluator. This process will be conducted by the SPRFMO OP Accreditation Evaluator in a fair, equitable, transparent and non-discriminatory manner.
28. Following evaluation and bilateral consultation, the SPRFMO OP Accreditation Evaluator shall provide a Draft Preliminary Evaluation Report to the Member, CNCP or service provider pursuing accreditation within 30 days for comment prior to the report being provided to the Secretariat. The SPRFMO OP Accreditation Evaluator shall then incorporate any additional information and provide the Preliminary Evaluation Report simultaneously to both the Secretariat and the Member, CNCP or service provider indicating whether the nominated national observer programme or service provider has met the minimum standards for accreditation under the SPRFMO OP.
29. When preparing a Preliminary Evaluation Report, and in addition to assessing the fulfilment of the standards indicated in Annex 3, the SPRFMO OP Accreditation Evaluator shall also consider those national programmes and service providers currently accredited by other RFMOs.
30. The SPRFMO OP Accreditation Evaluator shall assess the consistency and compatibility between the SPRFMO Minimum standards for accreditation under Annex 3 and those required by other RFMOs, along with their practical implementation and functioning. The Member or CNCP shall provide to the Secretariat the name of the national observer programme or service provider accredited by other RFMOs, the RFMO that has accredited it, and any other supporting information requested by the Accreditation Evaluator.
31. If the Accreditation Evaluator finds that the observer programme has accreditation under another RFMO or arrangement that meets the SPRFMO Minimum standards for accreditation under Annex 3, along with its practical implementation and functioning, it will find the application favourable.
32. The Accreditation Evaluator shall submit the Final Evaluation Report to the Secretariat no later than 60 days in advance of the Commission meeting at which it is to be considered. The Secretariat shall circulate the Final Evaluation Report as an annex to the SPRFMO Observer Programme Implementation Report prior to the CTC meeting at which it is to be considered.
33. The CTC shall assess the Final Evaluation Report and make recommendations to the Commission regarding whether the observer programme has met the requirements of this CMM and, where relevant, whether a recommendation based on paragraphs 35 to 38 is appropriate.
34. The Commission shall decide whether to grant accreditation at its next meeting on the basis of the Final Evaluation Report and any recommendations from the CTC.
35. If the Final Evaluation Report by the SPRFMO OP Accreditation Evaluator is favourable, the Commission may decide to adopt the report and grant accreditation under the SPRFMO OP for 5 years from the date upon which accreditation is granted.
36. Should the Commission decide that, despite the favourable findings of the Final Evaluation Report by the SPRFMO OP Accreditation Evaluator, the application does not meet the minimum standard required for accreditation (Annex 3), it may decide not to grant accreditation. In that case it shall clearly outline the basis for its decision.
37. If the Final Report by the SPRFMO OP Accreditation Evaluator is not favourable, the Commission may decide to adopt the report and not grant accreditation.
38. Should the Commission decide that, despite the findings of the non-favourable Final Evaluation Report by the SPRFMO OP Accreditation Evaluator, the application meets the minimum standard required for accreditation (Annex 3), the Commission may decide to grant accreditation under any conditions as may be specified by the Commission. These conditions may include the accreditation of a national observer programme or a service provider on a temporary and conditional basis pending the fulfilment by that Member, CNCP or service provider of the deficiencies detected during the accreditation process.



39. In case an application for accreditation is not granted, nothing prevents a Member, CNCP or service provider from presenting a new application to seek accreditation. When reapplying for accreditation Members, CNCPs and service providers shall consider the findings and recommendations of the SPRFMO OP Accreditation Evaluator and the Commission.
40. Members, CNCPs and service providers shall be entitled to renew accreditation.
41. A Member may request that the Commission revoke, condition or suspend accreditation for a national observer programme or service provider at any time but not later than 30 days in advance of the next CTC meeting by providing evidence that the national observer programme or service provider is not meeting the minimum standards for accreditation. The Executive Secretary shall circulate the request for revocation, condition or suspension to Members as soon as possible but no later than 15 days after the request is received, and the SPRFMO OP Accreditation Evaluator shall be asked to advise the CTC on the matter no later than 20 days after the request was circulated.
42. The CTC shall assess the request to revoke, condition or suspend an accreditation and the information provided at its next annual meeting, as well as any information provided by other Members, and may provide recommendations to the Commission. The Commission shall consider the CTC's recommendations and the request to revoke suspend or condition accreditation at its next annual meeting.
43. The Secretariat shall publicise the name of all observer programmes accredited under the SPRFMO OP, together with relevant contact details, on the SPRFMO website and shall include a list of all national observer programmes or service providers accredited under the SPRFMO OP in the annual OP Implementation Report described in paragraph 47.

Data Collection

44. Members and CNCPs shall ensure that observers deployed on vessels flying their flag, and, where applicable, complementary means of collecting data and information, collect and provide the information specified in Annex 7 of CMM 02-2022 (Data Standards) in the manner set forth in that CMM and shall also provide relevant observer information required under any other CMM.
45. Nothing in this CMM shall prevent Members and CNCPs from taking additional actions related to data collection compatible with this measure.

Reporting

46. Members and CNCPs shall include a brief overview of the national observer programmes or service providers covering its fishing activity as a component of the Annual National Reports submitted by Members and CNCPs to the SC and developed in accordance with the "Guidelines for Annual National Reports to the SPRFMO Scientific Committee".
47. The Secretariat shall prepare a report on the implementation of the SPRFMO OP for presentation at each annual meeting of the CTC, using information from annual reports, observer data, and all other suitably documented and relevant information in its possession. The SPRFMO OP Implementation Report will address, *inter alia*: (1) information on problems that have been encountered; (2) recommendations for improving current standards and practices; (3) developments in observer programmes and observational methods; (4) constraints to accreditation and (5) in general any identifiable problem or obstacle in fulfilling the objectives and purpose of this CMM as outlined in paragraphs 1 and 2.
48. The SPRFMO OP Implementation Report shall be distributed to Members and CNCPs 30 days prior to each annual CTC meeting.
49. The CTC shall review the recommendations delivered by the SPRFMO OP Implementation Report and provide advice to the Commission thereon, including proposed actions to be taken.



50. The Secretariat shall make available observer data to the SC, at its request. Data confidentiality shall be maintained as set forth in procedures specified in paragraph 6 of CMM 02-2022 (Data Standards) and in any other data procedures that may be adopted by the Commission.

Review

51. The CTC shall review the implementation and effectiveness of this CMM at least every five years, including the observer safety requirements, the applicability of the SPRFMO OP to other fishing vessels and any additional requirements as necessary to meet the objectives of both Article 28 of the Convention and this CMM.

52. The SC shall periodically review and provide advice on the appropriate level of observer coverage needed in each fishery to meet data needs.

53. Should the SC recommend that a change in coverage or research priorities for specific fisheries is needed, the revised coverage levels, if adopted by the Commission, will be specified in the relevant fishery CMMs.

Entry into Force

54. This CMM shall enter into force 120 days after the conclusion of the Commission's 2019 Annual Meeting.

55. Members and CNCPs may continue using their own non-accredited national observer programme or service provider to meet observer coverage requirements until 31 December 2024. From 1 January 2025 Members and CNCPs shall only deploy observers from national observer programmes or service providers accredited under the SPRFMO.



ANNEX 1

Minimum Standards for Observers

Observer Rights⁵

In fulfilling their tasks and duties, observers shall have the following rights:

- a) Freedom to carry out their duties without being assaulted, obstructed, delayed, intimidated or interfered with;
- b) Access to and use of all facilities and equipment of the vessel necessary to carry out the observer's duties, including but not limited to full access to the bridge, catch before being sorted, processed catch and any bycatch on board, as well as areas which may be used to hold, process, weigh, and store fish, as safety permits;
- c) Access to the vessel's records, including logbooks, vessel diagrams and documentation for reviewing records, assessment and copying, as well as access to navigational equipment, charts, and other information related to fishing activities;
- d) Access to and use of communications equipment and personnel, upon request, for entry, transmission, and reception of work-related data or information;
- e) Reasonable use of the communication equipment on board to communicate with the observer programme on land at any time including emergencies;
- f) Access to additional equipment, if present, to facilitate the work of the observer while on board the vessel, such as high-powered binoculars, electronic means of communication, freezer to store specimens, scales, et cetera;
- g) Safe access to the working deck or hauling station, during net or line retrieval and access to specimens on deck (alive or dead) in order to collect samples;
- h) Unrestricted access to food, accommodation and sanitary facilities of a standard equivalent to those normally available to an officer on board the vessel as well as medical facilities that meet international maritime standards;
- i) Access to verify safety equipment on board (through a safety orientation tour provided by officers or crew) before the vessel leaves the dock;
- j) Unrestrained permission to record any pertinent information relevant for scientific purposes and data collection;
- k) A designated contact or supervisor on land to communicate with at any time while at sea;
- l) To refuse deployment on board a fishing vessel for justified reasons, including where safety issues have been identified. The national observer programme or service provider shall ensure that the reasons for such refusal are documented and a copy of such document is provided to the SPRFMO Secretariat, which will forward it to the flag State of the vessel;
- m) The ability to communicate at any time the occurrence of safety issues to the vessel captain, national observer programme, service provider, the Secretariat, and flag State, as appropriate;
- n) Upon request by the observer, receiving reasonable assistance by the crew to perform their duties including, among others, sampling, handling large specimens, releasing incidental specimens and measurements;
- o) Privacy in the observer's personal areas;
- p) Not performing duties assigned to the crew, such as gear handling (for fishing purposes), offloading fish, *et cetera*;
- q) Observer data, records, documents, equipment and belongings will not be accessed, harmed, or destroyed.

⁵ For artisanal vessels of developing coastal States of no more than 15 meters in length fishing for jumbo flying squid consistent with paragraph 4, observer rights are included in Annex 4.



Members and CNCPs shall ensure that operators, captains, officers and crew on board vessels flying their flag respect the rights of observers and that a copy of these rights are provided to the crew and/or prominently displayed.

Observer duties

The duties of observers include:

- a) Carrying complete and valid documents before boarding the vessel, including, when relevant, identification documents, passport, visas, and certificates of at sea security training;
- b) Submitting copies of the documents indicated above to the programme managers of the national observer programme or service provider, as required;
- c) Maintaining independence and impartiality at all times while on duty;
- d) Complying with the laws and regulations of the Member or CNCP whose flag the vessel is flying, as applicable;
- e) Respecting the hierarchy and general rules of behaviour that apply to the vessel personnel;
- f) Performing duties in a manner that does not unduly interfere with the operations of the vessel and while carrying out their functions giving due consideration to the operational requirements of the vessel and communicating regularly with the captain or master of the vessel;
- g) Being familiar with the emergency procedures aboard the vessel, including the locations of life rafts, fire extinguishers, and first aid kits, and participating regularly in emergency drills for which the observer has received training;
- h) Communicating regularly with the vessel captain on relevant observer issues and duties;
- i) Refraining from actions that could negatively affect the image of the SPRFMO OP;
- j) Adhering to any required codes of conduct for observers, including any applicable laws and procedures;
- k) Communicating as regularly as is required with the programme managers and/or national programme coordinator on land;
- l) Complying with any SPRFMO CMMs whose provisions are directly applicable to observers;
- m) Respect the privacy in the captain and crew areas.



ANNEX 2

Duties of Vessel Operators, Captain, Officers and Crew

Members and CNCPs shall ensure that vessel operators and captains, officers and crew, as applicable, comply with the following provisions regarding the SPRFMO OP:

Rights of Vessel Operators and Captains

Vessel operators and captains shall have the following rights:

- a) To agree to the timing and placement, when required to take on board one or more observers;
- b) To conduct operations of the vessel without undue interference due to the observer's presence and performance of the observer's duties;
- c) To assign, at his or her discretion, a vessel crew member to accompany the observer when the observer is carrying out duties in hazardous areas;
- d) To be timely notified by the observer provider on completion of the observer's trip of any comments regarding the vessel operations. The captain shall have the opportunity to review and comment on the observer's report and shall have the right to include additional information deemed relevant or a personal statement.

Duties of Vessel Operators and Captains

Vessel operators and captains shall have the following duties:

- a) Accept on board the vessel one or more persons identified as observers by the SPRFMO OP when required by the Member or CNCP to which the vessel is flagged;
- b) Ensure the vessel crew is properly briefed and does not assault, harass, obstruct, resist, intimidate, influence, or interfere with the SPRFMO OP observer or impede or delay the observer in the performance of duties;
- c) If required by a SPRFMO CMM, as a complementary monitoring tool, install and maintain functioning electronic monitoring systems or devices throughout the selected fishing trips;
- d) Ensure the observer has access to the catch before any sorting, grading or other separation of the components of the catch are made;
- e) Ensure that vessels operating in the Convention Area include adequate space for the observer to conduct bycatch sampling or other sampling as needed, in a safe manner that limits interference with vessel operations, with a dedicated sample station and other equipment such as scales;
- f) Maintain a safe and clean sampling station to be used by the observer;
- g) Not alter the sampling station during an observed trip without consultation with the observer and subsequent notification to the Member or CNCP in control of the vessel;
- h) Inform the crew regarding the timing and objectives of the SPRFMO OP and schedule for observer boarding, as well as their responsibilities when an observer from the SPRFMO OP boards the vessel;
- i) Assist the SPRFMO OP observer to safely embark and disembark the vessel at an agreed upon place and time;
- j) Allow and assist the SPRFMO OP observer to carry out all duties safely and ensure the observer is not unduly obstructed in the execution of duties unless there is a safety issue that requires intervention;
- k) Allow and assist the SPRFMO OP observer to remove and store samples from the catch and allow the observer access to stored specimens;
- l) Provide the observer, while on board the vessel, at no expense to the observer, national programme or service provider, with food, accommodation, adequate sanitary amenities and medical facilities of a standard equivalent to those normally available to an officer on board the vessel according to



- generally accepted international standards;
- m) Allow and assist full access to and use of all facilities and equipment of the vessel that is necessary for the observer to carry out his or her duties, including but not limited to full access to the bridge, catch before being sorted, processed catch and any bycatch on board, as well as areas which may be used to hold, process, weigh and store fish;
 - n) Follow an established mechanism, if adopted by the Commission, for solving conflicts that would complement the established dispute settlement processes provided by observer programmes and providers;
 - o) Cooperate with the observer when the observer is sampling the catch;
 - p) Provide notice to the observer at least fifteen (15) minutes before fishing gear hauling or setting procedures, unless the observer specifically requests not to be notified;
 - q) Provide adequate space to the observer in the bridge or other designated area for clerical work, as well as adequate space on deck or the factory to perform the observer's duties;
 - r) Provide personal protective equipment, and, where appropriate, an immersion suit;
 - s) Provide to the observer timely medical attention in case of physical or psychological illness or injury;
 - t) Develop and maintain an emergency action plan (EAP) regarding observer safety.

Safety Orientation Briefing

Vessel captains or a crew member designated by the captain shall provide the observer with a safety orientation briefing at the time of boarding the vessel and before it leaves the dock. The orientation briefing shall include:

- a) Safety documentation of the vessel;
- b) Location of life rafts, raft capacities, observer's assignment, expiration, installation, and any other relevant safety related information;
- c) Location and instructions for use of emergency radio beacons indicating position in case of an emergency;
- d) Location of immersion suits and personal floating devices, their accessibility, and the quantities for everyone onboard;
- e) Location of flares, types, numbers, and expiration dates;
- f) Location and number of fire extinguishers, expiration dates, accessibility, et cetera;
- g) Location of life rings;
- h) Procedures in case of emergencies and essential actions of the observer during each type of emergency, such as a fire on board, recovering a person overboard, et cetera;
- i) Location of first aid materials and familiarity with crew members in charge of first aid;
- j) Location of radios, procedures for making an emergency call, and how to operate a radio during a call;
- k) Safety drills;
- l) Safe places to work on deck and safety equipment required;
- m) Procedures in case of illness or accident of the observer or any other crew member.

Procedure in the Event of an Emergency

If a SPRFMO observer dies, is missing or presumed fallen overboard, the Member whose flag the vessel is flying shall ensure that the fishing vessel:

- a) Immediately ceases all fishing operations;
- b) Immediately commences search and rescue if the observer is missing or presumed fallen overboard, and searches for at least 72 hours, unless the observer is found sooner, or unless instructed by the Member whose flag the vessel is flying to continue searching;
- c) Immediately notifies the Member whose flag the vessel is flying;



- d) Immediately notifies the Member or observer provider to whom the SPRFMO OP observer belongs, if applicable;
- e) Immediately alerts other vessels in the vicinity by using all available means of communication;
- f) Cooperates fully in any search and rescue operation;
- g) Whether or not the search is successful, return the vessels for further investigation to the nearest port, as agreed by the Member whose flag the vessel is flying and the national observer programme or service provider;
- h) Provides the report to the observer providers and appropriate authorities on the incident; and
- i) Cooperates fully in any and all official investigations, and preserves any potential evidence and the personal effects and quarters of the deceased or missing observers.

Flag States shall take and implement all steps, as a matter of due diligence, to prevent incidents causing serious harm or death to observers on board vessels flying their flag, and to sanction or punish those involved, including through criminal investigation and prosecution. The flag State and other Members and CNCPs shall cooperate to that end.



ANNEX 3

Minimum Standards for Accreditation Under the SPRFMO OP

This Annex contains the Commission's minimum standards for accreditation under the SPRFMO OP. In accordance with paragraphs 28 and 32 of this CMM, the OP Accreditation Evaluator shall assess and decide all applications against these standards.

Impartiality, Independence and Integrity

1. National observer programmes and service providers shall only deploy independent and impartial observers. This means that neither the national observer programme or service provider, as the case requires, nor the individual observers, have a direct financial interest, ownership or business links with vessels, processors, agents and retailers involved in the catching, taking, harvesting, transporting, processing or selling of fish or fish products.
2. The national programme or service provider, and the individual observers:
 - a) Shall not have a direct financial interest, other than the provision of observer services, in the fisheries under the purview of the Commission, including, but not limited to: i) any ownership, mortgage holder, or other secured interest in a vessel or processor involved in the catching, taking, harvesting or processing of fish; ii) any business selling supplies or services to any vessel or processor in the fishery; iii) any business purchasing raw or processed products from any vessel or processor in the fishery;
 - b) Shall not solicit or accept, directly or indirectly, any gratuity, gift, favour, entertainment, inordinate accommodation, loan or anything of monetary value from anyone who either conducts activities that are regulated by a Member or CNCP connected with its services or the Commission, or has interests that may be substantially affected by the performance or non-performance of the observer's official duties;
 - c) Shall not serve as an observer on any vessel or at any processors owned or operated by a person who previously employed the observer in another capacity within the last three years (e.g., as a crew member); and,
 - d) Shall not solicit or accept employment as a crew member or an employee of a vessel or processor while employed by a national observer programme or service provider.

Observer Qualifications

The qualification of individual observers is the responsibility of national observer programmes or service providers. The national observer programme or service provider shall demonstrate that observers that are recruited into their programme have relevant education or technical training and/or experience for the fleets concerned; ability to meet the observer duties described in this annex; no record of convictions calling into question the integrity of the observer or indicating a propensity towards violence; and the ability to obtain all necessary documentation, including passports and visas.

Observer Training

National observer programmes or service providers shall demonstrate that observers are adequately trained before their deployment. Training shall include the following:

1. The relationship between fisheries science and fisheries management and the importance of data collection in this context;
2. The relevant provisions of the Convention and SPRFMO CMMs relevant to the functions and duties of observers;
3. Importance of observer programmes, including understanding the duties, rights, authority and responsibilities of observers;
4. Safety at sea, including emergencies at sea, donning survival suits, use of safety equipment, use of radios, survival at sea, management of conflicts, and cold-water survival;



5. First aid training, appropriate to working at-sea or in remote situations;
6. Species identification and record of species encountered at sea, including target and non-target species, protected species, seabirds, marine mammals, sea turtles, invertebrates indicating vulnerable marine ecosystems, et cetera;
7. Knowledge of the different types and functioning of bycatch mitigation devices required by SPRFMO CMMs;
8. Safe handling protocols to rehabilitate and release seabirds, marine mammals and sea turtles;
9. Fishing vessel and fishing gear types relevant to SPRFMO;
10. Techniques and procedures for estimating catch and species composition;
11. Use and maintenance of sampling equipment including scales, callipers, et cetera;
12. Sampling methodologies at sea, i.e., fish sampling, fish sexing, measuring and weighing techniques, specimen collection and storage, and sampling methodologies;
13. Understand potential biases in sampling, how they arise and how they could be avoided;
14. Preservation of samples for analysis;
15. Data collection codes and data collection formats;
16. Familiarity with catch logbooks and recordkeeping requirements to aid observers' collection of data as required under SPRFMO CMMs;
17. Use of digital recorders or electronic notebooks;
18. Electronic equipment used for observer work and understanding their operation;
19. Use of electronic monitoring systems as a complement to their work, when applicable;
20. Verbal debriefing and report writing;
21. Training on relevant aspects of the International Convention for the Prevention of Pollution from Ships (MARPOL).

Refresher training should be ongoing dependent on the qualification requirements. Relevant updates to CMMs and observer requirements should be communicated to observers before each deployment as part of the briefing process, for example in an updated manual.

Observer Trainers

National programmes or service providers shall demonstrate that observer trainers have the appropriate skills and have been authorised by that national programme or service provider to train observers.

Briefing and Debriefing

National observer programmes or service providers shall demonstrate that there are systems for briefing and debriefing observers and communicating at any time with vessel captains. The briefing and debriefing process shall be conducted by properly trained personnel and shall ensure that observers and vessel captains clearly understand their respective roles and duties.

Data Validation Process

National observer programmes or service providers shall demonstrate that they have in place an observer data validation process in place. The data validation process shall be conducted by properly trained personnel and shall ensure that data and information collected by an observer are checked for discrepancies or inaccuracies that are corrected before the information is entered into a database or used for analysis. This includes ensuring that the national observer programme or service provider has in place a mechanism to receive data, reports and any other relevant information from an observer in such a way that prevents interference in that data from other sources. The data validation process shall ensure that the data meet the following standards:

- a) A mechanism that allows scientific data to be stored and transferred to the national observer programme (or service provider) in a secure and confidential manner.
- b) Vessel information uniquely identifies the actual vessel from which the fishing occurred;
- c) Dates and times of fishing effort are included and internally consistent (for example an end time should be after a start time);
- d) Location of fishing is included and valid (for example, logical latitude/longitude combinations), internally consistent and entered in the correct units;



- e) Effort data allows quantification of the amount of effort invested by the vessel, appropriate to the fishing method used, which is also identified;
- f) Catch information identifies the fishery resource (to the species level where possible) and the quantity of that species retained or discarded. If used, species codes are accurate;
- g) Where biological or length information is collected for a fish, it is directly linked to the effort in which it was caught – including date and time, location, and fishing method information, and includes the methodology of data collection;
- h) If the observer programme extends to transshipment and/or landings, then the amount and species of fishery resources transhipped/landed is quantified and recorded according to a standard methodology;
- i) Interaction data involving marine mammals, seabirds, reptiles and/or other species of concern identifies the individual species (where possible), the number of animals, fate (retained or released/discarded), life status if released (vigorous, alive, lethargic, dead), and the type of interaction (hook/line entanglement/warpstrike/net capture/other).

Observer Identification Cards

National observer programmes or service providers shall provide observers with identification cards that include the full name of the observer, date of issue and expiration, the name of the national observer programme or service provider, a unique identifying number (if issued by the national observer programme or service provider) a passport style photo of the observer, an emergency phone number.

Coordinating Observer Placements and Observer Deployments

National observer programmes or service providers shall demonstrate responsibility and capacity for the timely deployment of observers and will ensure that the selected observer receives all possible assistance during the entire length of their placements.

National observer programmes or service providers shall have in place a protocol to replace an observer if the observer becomes unable to perform their duties.

National observer programmes or service providers shall also seek, to the extent possible, to avoid deploying a single observer on multiple consecutive trips on the same vessel.

It is the responsibility of a national observer programme or service provider to administer observer placements, to maintain the independence and impartiality of observers as described in this measure and ensure that all placements are administratively finalised as soon as practicable after the observers return to port. The national observer programme or service provider is expected to communicate with the observer regarding upcoming deployments, coordinate observer travel, and provide the necessary supplies for observer duties.

Observer Safety Equipment

National observer programmes or service providers must demonstrate that observers are provided with appropriate equipment, including safety equipment, which is in good working order, routinely checked and renewed to carry out their duties on board a vessel. Essential equipment includes a lifejacket, independent two-way communication device capable of sending and receiving voice or text communications, personal locator beacons (PLBs), immersion suits, hard hat, proper deck working boots or shoes, gloves and protective glasses (including sunglasses).

Responding to Allegations of Observer Misconduct

National observer programmes or service providers must establish procedures for preventing, investigating, and reporting on the misconduct of observers, in coordination with observers, vessel captains, and relevant Members and CNCPs.



Dispute Settlement

National observer programmes or service providers shall demonstrate the existence of a dispute resolution process fair to all parties that provides a process to resolve issues through appropriate means including facilitation and mediation.

Observer Safety

National programmes or service providers must demonstrate that procedures are in place to support observers in their ability to carry out their duties unimpeded and in a safe working environment, including an established Emergency Action Plan (EAP). The EAP must provide instructions on sending reports to the provider's designated 24-hour point(s) of contact to report unsafe conditions, including instances of harassment, intimidation or assault.

National observer programmes or service providers must also provide a permanent delegate or supervisor on land to communicate with the observer at any time while at sea.

Insurance and Liability

National observer programmes or service providers must demonstrate that observers have health, safety and liability insurance commensurate with the national standards of the observer programme or service provider for such insurance for the duration of any deployment before placing the observer on a vessel.



ANNEX 4

IMARPE Observer Program for the On-Board and In-Port Monitoring of the Catches and Fishing Activities of Peruvian Artisanal Vessels Authorised to Fish Jumbo Flying Squid *Dosidicus gigas* in the High Seas, in the Area of the Application of the SPRFMO Convention in accordance with paragraph 4 of the CMM 16-2023

1. SCOPE OF APPLICATION

This alternative mechanism shall apply to the vessels with no more than 15 meters of length that are registered in the Record of Vessels of the SPRFMO and that are authorised by the Peruvian Government to fish in the Convention Area.

2. COVERAGE OF THE OBSERVER PROGRAM

For the purposes of the coverage of observers established in paragraph 16 of the CMM 18-2023, the alternative mechanism shall adopt the following one:

(a) coverage of 5% or more of the trips of the artisanal fishing vessels involved, through observers on board, who will provide detailed information on the catch, fishing areas, fishing effort and biometric and biological data of what is caught.

(b) an approximate coverage of 80% or more of the landings (and trips) of the artisanal fishing vessels involved, through observers in port from IMARPE and/or from the Ministry of Production (PRODUCE), who will provide information on the catch, the fishing areas and fishing effort;

(c) coverage of 90% or more of the trips of the artisanal fishing vessels involved, through an information system using a traceability application⁶ running on portable smartphones, with which fishermen will provide in real-time all relevant information on their fishing trip, including on their catch, fishing areas and fishing effort.

3. INSTITUTO DEL MAR DEL PERU'S OBSERVERS

This alternative mechanism shall be executed by the Observers from Instituto del Mar del Peru as part of its regular monitoring system for the jumbo flying squid of Peru and for informational status, as an on-board observer and as a port observer

Cooperation agreements between CAPECAL and APAMARPA (Scientific and fishing sectors), which guarantees the correct deployment of observers on board artisanal vessels.

3.1. Observers' employment status

The observers are professionals in the areas of biology, fisheries engineering, fisheries technicians and fishermen. The port observers are IMARPE personnel with an Administrative Service Contract (Contrato Administrativo de Servicios, CAS), while the on-board observers are temporary workers. In both cases they receive a monthly remuneration.

3.1.1. Requirements to be an on-board observer

Training level: fishing technologist, bachelor or professional in areas of fisheries engineering or biology;
Experience: minimum of 3 months in the performance of similar jobs and/or in the performance of equivalent functions;

⁶ There is an agreement for the use of the traceability application "TrazApp" (<https://www.trazapp.org>), that has been developed by the non-governmental organization World Wildlife Foundation (WWF), which has been implemented in Peruvian artisanal jigging fleet.



Specialisation program: have successfully completed a survival at sea course;

Required knowledge: knowledge of general biology and taxonomy of hydrobiological resources and preferably of jumbo flying squid-squid, and knowledge of fisheries data collection techniques and basic computer software (e.g., Excel, Word, others); and,

Insurance: have processed and have a Complementary Work and Risk Insurance (health insurance) and a Complementary Work and Risk Insurance (pension insurance) as a temporary worker.

3.1.2. Requirements to be a port observer

Training level: fisheries engineers, biologists, fisheries technician or local fisherman (who will be previously trained and shall already have a good knowledge of the local fishing activities and enjoy a good stand within the local fishing community);

Experience: minimum 1 year in the performance of similar jobs and/or in the performance of equivalent functions;

Specialisation program: have successfully completed a survival at sea course;

Required knowledge: general knowledge of the common local fish species, knowledge of fisheries data collection techniques and basic computer software (e.g., Excel, Word, others).

3.2. Observer training

IMARPE will be responsible for the training of the port and on-board observers for the monitoring of the artisanal jumbo flying squid fishery. The training will include aspects related to the rights and duties of the observers on board and at the landing sites, the type and method of collecting data from the fishery on board and in port, the carrying out of biometric and biological samples of the catches on board, and of the landings in port.

In addition, the observer must have basic training of the MAM-009 course, carried out in the aquatic instruction centres authorised by the General Directorate of Captaincies and Coast Guard of Peruvian Navy, in order to obtain the certification of specialised fishing sailor.

3.3. Observer rights at landing sites

- Right to be issued and carry an identification document that certifies him/her as an IMARPE observer;
- Right to have all the materials that are needed to perform their work at the landing sites;
- Right to be granted access to all the port facilities through which catch landings takes place and the right to take biological samples;
- Right not to perform tasks assigned to the crew such as unloading of fish;
- Right that the data, records, documents, equipment and belongings of the observer are not be manipulated, damaged or destroyed;
- Right to be treated with respect by the skippers and crew of the fishing vessels as well as by the managers and personnel in charge of the landing sites, who will be provided with a copy of these rights; and,
- Right to receive periodical training.

3.4. Observer rights on board vessels

- Freedom to carry out their duties without being assaulted, obstructed, delayed, intimidated or interfered with;
- Access to and use of all facilities and equipment of the vessel necessary to carry out the observer's



duties, including but not limited to full access to the vessel compartments, as safety permits;

- Access to the vessel's records, including logbooks, vessel diagrams and documentation for reviewing records, assessment and copying, as well as access to navigational equipment, charts, and other information related to fishing activities⁷;
- Access to and use of communications equipment if available and personnel, upon request, for entry, transmission, and reception of work-related data or information.
- Reasonable use of the communication equipment on board to communicate with the observer programme on land at any time including emergencies, if available;
- Safe access to the working deck or hauling station, during net or line retrieval and access to specimens on deck (alive or dead) in order to collect samples;
- Unrestricted access to food and sanitary facilities of a standard equivalent to those normally available to the skippers or an officer on board the vessel as well as medical facilities that meet international maritime standard;
- Access to verify safety equipment on board (through a safety orientation tour provided by officers or crew) before the vessel leaves the dock;
- Unrestrained permission to record any pertinent information relevant for scientific purposes and data collection;
- To refuse deployment on board a fishing vessel for justified reasons, including where safety issues have been identified. The national observer programme or service provider shall ensure that the reasons for such refusal are documented and a copy of such document is provided to the SPRFMO Secretariat, which will forward it to the flag State of the vessel;
- Access to and use of communications equipment if available to communicate at any time the occurrence of safety issues to the vessel captain, national observer programme, service provider, the Secretariat, and flag State, as appropriate;
- Upon request by the observer, receiving reasonable assistance by the crew to perform their duties including, among others, sampling, handling large specimens, releasing incidental specimens and measurements;
- Not performing duties assigned to the crew, such as gear handling (for fishing purposes), offloading fish, et cetera;
- Observer data, records, documents, equipment and belongings will not be accessed, harmed, or destroyed.

3.5. Observer duties

- Always carry their identification documents while working on board and/or at landing sites;
- Maintain independence and impartiality at all times while on duty;
- Prepare a report of the activities carried out on board at the end of each fishing trip and deliver it together with the forms, information and samples collected to the designated coordinator of the closest IMARPE Coastal Laboratory; and,
- Maintain the confidentiality and reserve of the information accessed by virtue of the contract as observer.

⁷ The crew shall use traceability application "TrazApp" (<https://www.trazapp.org>) as a digital logbook and to register the vessel information.



4. STANDARD DATA TO BE COLLECTED

When an IMARPE observer is on board the fisheries data will be collected for each set or each fishing operation.

When there is no IMARPE observer on board, the catch data, fishing areas and number of fishermen by trip will be collected arrival to port by the IMARPE observer in the landing site or by a designated representative of the Peruvian Government (from IMARPE or PRODUCE) when the vessel arrives at port disembarkation.

The mobile traceability application "TrazApp" is already in use by some artisanal fishermen in the Peru and it is hoped that through an IMARPE-WWF agreement, its use can be extended and generalised at least amongst those artisanal vessels seeking authorisation to fish for jumbo flying squid in the Convention area. The data obtained with the use of this application will expand and complement the information and data obtained through the observers on board and in port, allowing for detailed information to be collected on the duration, geographical position, catch and effort per set or fishing operation even when there are no observers on board or in port.

The fishermen and skippers of the artisanal vessels being authorised to fish for jumbo flying squid in the Convention area will be instructed that, when they plan to go out fishing for jumbo flying squid more than 200 nm away from the coast, they will notify the local IMARPE representative in advance, so that priority may be given to assigning an IMARPE observers aboard one or more of these vessels.

The fishermen and skippers of the artisanal fishing vessels being authorised to fish for jumbo flying squid in the Convention area will be instructed that, whenever they have carried out fishing operations for jumbo flying squid more than 200 nm away from the coast without having brought an IMARPE observer on board, they will proceed to report to the IMARPE port observer as soon as they arrive to port, in order to proceed with the data collection and sampling of the catch of said vessel as a matter of priority.

The type of information and data to be collected from each vessel and trip will depend on whether the vessel has an IMARPE or PRODUCE observer at port, and whether the skipper of the boat has access to the mobile traceability application "TrazApp".

4.1. When an IMARPE Observer is on-board

The data to collected will be:

- Vessel flag,
- Name of the vessel,
- Vessel registration number,
- Date of fishing activity (UTC format),
- Position at the start of each set or fishing operation, with resolution of 1/10th degree, decimal format, of latitude and longitude,
- Position at the end of each set or fishing operation, with resolution of 1/10th degree, decimal format, of latitude and longitude,
- Target species (FAO species code),
- Number of crew,
- Number of jigs and number of hand lines,
- Total fishing hours per set or fishing operation,
- Estimated total catch (kg) of jumbo flying squid per set or fishing operation,
- Identification and estimated total catch (kg) of any other species caught, if any, per set or fishing operation,



- Size-frequency sampling of squid caught in each set or fishing operation (see Annex 1, section 3),
- Biological sampling of squid specimens per set or fishing operation (see Annex 1, section 4).

4.2. When there is no IMARPE observer on-board and there is a port observer from IMARPE or from PRODUCE

The data to be collected will be:

- Vessel flag,
- Name of the vessel,
- Vessel registration number,
- Date of fishing activity (UTC format)
- Referential position of the fishing area, with resolution of 1/10th degree, decimal format, of latitude and longitude, as declared by the skipper or master fisherman,
- Target species (FAO species code),
- Number of crew,
- Number of jigs and number of hand lines,
- Total catch (kg),
- If it is possible to identify and separate the specimens caught in the Convention area, a length-frequency sampling of the squid caught in the Convention area will be carried out,
- In coordination with and subject to acceptance of the skipper or master fisherman, samples of non-gutted squid specimens caught in the Convention properly selected and preserved will be purchased for biological sampling in the laboratory.

4.3. When there is no IMARPE or PRODUCE observers, and the fishing pattern has the mobile traceability application “TrazApp”

The data to be collected will be:

- Vessel flag,
- Name of the vessel
- Vessel registration number
- Position at the start of each set or fishing operation, with resolution of 1/10th degree, decimal format, of latitude and longitude,
- Position at the end of each set or fishing operation, with resolution of 1/10th degree, decimal format, of latitude and longitude,
- Target species (FAO species code),
- Number of crew,
- Number of jigs and number of hand lines,
- Total fishing hours per set or fishing operation, and
- Estimated total catch (kg) of jumbo flying squid per set or fishing operation



5. SAMPLING ON BOARD BY IMARPE ON-BOARD OBSERVER

On trips where there is an IMARPE observer on board, the IMARPE observer will carry out daily biometric (size) and biological samplings of the jumbo flying squid being caught. This sampling will include:

5.1. Biometric sampling (of size frequency)

A simple random sample of maximum 120 squids will be collected and measured per fishing day (distributed among the different sets or fishing operations of that day), measuring and recording the dorsal mantle lengths.

5.2. Biological sampling

To obtain biological data, from the large daily sample above, 10 female and 10 male squids will be set aside by means of a stratified random sampling, so that the specimens cover the entire range of sizes in the large daily sample. Then, for each specimen, the following data will be determined and recorded:

- Mantle length (mm)
- Total weight (g)
- Eviscerated weight (g)
- Sex
- Maturity stage
- Evidence of copulation (females only)

6. SAMPLING IN PORT

In ports where there is an IMARPE Coastal Laboratory (i.e.: Tumbes, Paita, San José, Chicama, Huanchaco, Chimbote, Huacho, Callao, Pisco, Atico, Matarani and Ilo) arrangements will be made to buy part of the catch of those vessels that have caught jumbo flying squid more than 200 nm from the coast (in the Convention area) without having an IMARPE observer on board, for the purpose of carrying out biological sampling in the laboratory. This will be done only if it is possible to differentiate what has been caught in the Convention area, and those squids are landed whole (not gutted). For this, the master fisherman and/or crew fishermen of the artisanal vessels participating in the program will be instructed to bring to port samples of complete specimens, selected and conserved under certain criteria, and a fair price will be paid for that part of the catch delivered to IMARPE.



Protocol for biological and biometric sampling of jumbo flying squid *Dosidicus gigas*

1. Materials used

The materials to use in this process should include:

- Acrylic board,
- Measuring tape with 1 mm accuracy,
- Electronic scale with 0.01 g accuracy (for laboratory sampling),
- Dynamometer or “Roman” scale with 0.25 kg accuracy (for on-board sampling),
- Dissecting equipment: scissors, watchmaker's tweezers, straight tweezers, stainless steel knife,
- Vernier caliper or square caliper (for laboratory sampling, to measure the length of the testis, etc),
- Plastic trays,
- Stationery: pens, pencil, eraser, correction fluid, notepad,
- Biometric sampling form,
- Biological sampling form.

2. Sampling type

The sampling type being used is the one considered for cephalopods, and is carried out as follows:

To obtain biometric data, it will be by taking a simple random sample of maximum of 120 specimens per fishing day (distributed among the different fishing sets or fishing operations of the day); and,

To obtain biological data, 10 female and 10 male specimens from the above sample will be set aside per day by means of a stratified random sampling, so that the specimens cover the entire range of sizes in the large daily sample.

3. Biometric sampling

The dimension to be measured is the dorsal mantle length (LM) in mm with a measuring tape, from the proximal edge of the mantle to the distal edge following the gladius in a straight line.

The size frequency of the specimens in the daily sample must be recorded with vertical bars forming groups of 5 (with the 5th bar crossing over previous four) in the biometric sampling form (“Formato de muestreo - 01” del IMARPE, or IMARPE’s “Sampling format - 01”), together with the date, fishing area, catch weight (kg), sample weight (kg), name of the vessel and names of those who carried out the biometric sampling.

4. Biological sampling

The biological sampling will be different and will collect different sets of data depending on whether is conducted on board an artisanal vessel or in land, in a coastal laboratory, as follows:

Biological sampling on board. In this case, the on board observer will only be recording the mantle length (mm), total weight (g), gutted weight (g), sex, gonadal maturity stage and (in the case of females) evidence of copulation.

Biological sampling in coastal laboratories. In this case the port observers and/or the coastal laboratory personnel will do a more complete processing of the samples of whole squid specimens that have been purchased for sampling and research purposes from selected vessels participating in, or cooperating with the observers’ programme. And for this laboratory sampling:



- The mantle length (ML) of each specimen is measured to the nearest mm with measuring,
- The total weight of each specimen weighed to the nearest g with an electronic scale,
- The specimens placed in the ventral position are dissected and the sex and gonadal stage of maturity is determined using the scale proposed by PEREA et al. (2018),
- In the case of female specimens, the length of the nidamental gland (mm) is measured and the reproductive structures (*i.e.*, nidamental glands, oviducts, oviductal gland and ovary) are removed and set aside to be weighed. In the case of male specimens, the spermatophoric complex (sac and organ) and the testis are removed set aside to be weighed after measuring the length of the testis (mm). The reproductive structures of each male and female specimen are weighed with a precision scale to the nearest 0.01 g,
- The digestive gland is removed and weighed,
- The degree of fullness of the stomach is determined according to a 4-stage empirical scale (0 = empty, 1 = half full, 2 = full and 3 = completely full). The stomach is removed for dissection and qualitative analysis of items in the food content, which are classified into fish (F), crustaceans (C), squid (Sq), others (O) and red liquid (LR). Samples of stomachs are also collected for analysis at the IMARPE Trophic Ecology Laboratory, according to the established protocol,
- In females, evidence of copulation is determined by observing and recording the presence or absence of spermatophores in the oral veil,
- The statoliths, which are found in the nuchal region (under the siphon), are collected by using a scalpel blade to make a transverse cut, and with the help of a watchmaker's tweezers, it is extracted, cleaned and the pair of statoliths is placed in statolith boxes or cartons (the label will be the serial number or the length and sex).
- The mantle is weighed.

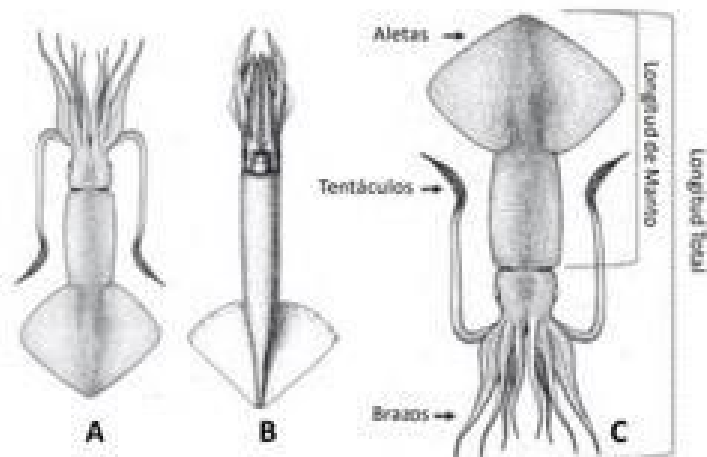
5. Anatomy of the jumbo flying squid

Figure 1.- Jumbo flying squid *Dosidicus gigas* in

(A) dorsal view (taken from ROPER *et al.*1984, in MARKAIDA 2001);

(B) ventral view (taken from WORMUTH 1976, in MARKAIDA 2001); and,




(C) dorsal view (modified from ROPER *et al.* 1984)






6. Gonadal maturity scale for females of jumbo flying squid

The description and macroscopic view of the four (4) stages of gonadal maturity of female jumbo flying squid (*Dosidicus gigas*) as described by PEREA et al. (2018) are summarised in the following chart.


STAGES	DESCRIPTION	PICTURES
I - Immature	The ovary is shaped like a pyriform sac, which is elongated, not granular and clear in appearance; being translucent in the initial phase of this stage. The wall of the ovary is very thin.	
II - Maturing	The vary looks grainy, opaque, creamy or slightly yellowish.	
III - Mature	Larger and turgid, more piriform in appearance, yellowish-cream to amber in color, due to the presence of a large number of mature oocytes. The wall of the ovary is thin. Oviduct of great size for being full of advanced mature oocytes. The nidamental gland is developed and turgid. It presents immature, maturing, and mature oocytes.	




<p>IV – Spawning or Expelling</p>	<p>Less turgid, granular, with lots of cream-colored and amber oocytes, with a predominance of the latter, giving an orange hue to the ovary.</p> <p>The wall of the ovary is very thin. Flaccid nidamental gland. The oviducts may be compact and large because they are full of advanced mature oocytes or somewhat flaccid due to their evacuation. In addition,</p> <p>in the external part of the oviductal gland some advanced mature oocytes are observed, a sign of spawning in the squid. Immature, maturing, and mature oocytes are observed. In the oviducts, these are full of oocytes at maximum maturity and ovulated. In the ovary, at microscopic level, the presence of post-ovulatory follicles is observed</p>	
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7. Gonadal maturity scale for males of jumbo flying squid

The description and macroscopic view of the three (3) stages of gonadal maturity of males of jumbo flying squid (*Dosidicus gigas*) as described by PEREA et al. (2018) are summarised in the following chart.

STAGES	DESCRIPTION	PICTURES
<p>I - Immature</p>	<p>Small, flaccid, elongated, white-colored and translucent testicle.</p>	



<p>II - Maturing</p>	<p>A larger, somewhat consistent, whitish to creamy, but not translucent testicle.</p> <p>Whitish spermatophore sack.</p>	
<p>III - Mature</p>	<p>A testicle of a more developed size with respect to the previous stages, turgid, whitecolored and milky in appearance.</p> <p>Spermatophore sac is full of spermatophores; free spermatophores are observed in the abdominal cavity.</p>	