



North Pacific Fisheries Commission

NPFC-2025-TCC08-IP03

## **Matters for coordination between SC and TCC**

### Secretariat

This paper is submitted to the TCC08 meeting for information purpose and intended for coordination between SC and TCC. The SC tasked the Secretariat to inform TCC about the following matters from the 9<sup>th</sup> SC meeting held in December 2024:

- (a) The SC proposed revisions to CMM 2024-05 for two new bottom fishing area closures to protect VMEs on Yuryaku Seamount (Annex A)
- (b) The SC responded to the questions from the TCC Chair (Annex B).
- (c) The SC will continue to discuss data needs and data gaps that could be filled by a regional observer program and inform the TCC about progress in these developments.

The SC agreed that, in accordance with Article 10, paragraph 4(d), one of the scientific objectives of an observer program could be to assess the impacts of fishing activities on fisheries resources and species belonging to the same ecosystem or dependent upon or associated with the target stocks.

The SC noted that it needs a more in-depth understanding of the characteristics of Members' fleets and the implications for feasible observer coverages and for appropriate coverage levels to ensure that reliable and representative data are collected. The SC agreed that it is too early for the SC to be able to provide scientifically defensible input on the kinds of data that would need to be collected from a regional observer program and the level of observer coverage that would be needed on fishing vessels by gear type. The SC agreed to continue to discuss this matter at the SC and its subsidiary bodies.

**Revised CMM 2024-05 - Conservation and Management Measure for Bottom Fisheries and Protection of Vulnerable Marine Ecosystems in the Northwestern Pacific Ocean**

**CMM 2024-05**

*(Entered into force 1 January 2025)*

**CONSERVATION AND MANAGEMENT MEASURE  
FOR BOTTOM FISHERIES AND PROTECTION OF VULNERABLE MARINE  
ECOSYSTEMS IN THE NORTHWESTERN PACIFIC OCEAN**

*The North Pacific Fisheries Commission (NPFC),*

*Strongly supporting* protection of vulnerable marine ecosystems (VMEs) and sustainable management of fish stocks based on the best scientific information available;

*Recalling* the United Nations General Assembly Resolutions (UNGA) on Sustainable Fisheries, particularly paragraphs 66 to 71 of the UNGA59/25 in 2004, paragraphs 69 to 74 of UNGA60/31 in 2005, and paragraphs 69 and 80 to 91 of UNGA61/105 in 2006; paragraphs 113, 117 and 119 to 124 of resolution 64/72 in 2009, paragraphs 121, 126, 129, 130 and 132 to 134 of resolution 66/68 in 2011, paragraphs 156, 171, 175, 177 to 188 and 219 of resolution 71/123 in 2016 and paragraphs 181 and 203-219 of resolution 77/118 in 2022;

*Noting*, in particular, paragraphs 66 and 69 of UNGA59/25 that call upon States to take action urgently to address the issue of bottom trawl fisheries on VMEs and to cooperate in the establishment of new regional fisheries management organizations or arrangements;

*Recognizing* UNGA's calls to identify and overcome barriers to the implementation of the relevant paragraphs of General Assembly resolutions such as data availability, especially with regard to baseline data and the spatial distribution and connectivity of vulnerable marine ecosystems, including their associated and dependent species; periodically review and revise impact assessments whenever a substantial change in the fishery has occurred or there is relevant new information; and ensure that the precautionary approach is applied, including in the utilization of impact assessments

to inform management decisions and consideration of significant adverse impacts on vulnerable marine ecosystems, including their associated and dependent species;

*Recognizing further* that fishing activities, including bottom fisheries, are an important contributor to the global food supply and that this must be taken into account when seeking to achieve sustainable fisheries and to protect VMEs;

*Recognizing* the importance of collecting scientific data to assess the impacts of bottom fisheries on marine species and VMEs;

*Recognizing* that scientific literature indicates the likely occurrence of VMEs on most seamounts in the area and has documented significant adverse impacts to VMEs resulting from bottom fishing in the area, which reinforces the importance of regularly updating impact assessments and considering the adequacy of the existing management framework through the SC and the Commission;

*Concerned* about potential significant adverse impacts of bottom fisheries on marine species and VMEs in the western part of the Convention Area.

*Recognizing* Article 2 of the Convention on the Conservation and Management of High Seas Fisheries Resources in the North Pacific Ocean (the Convention), which provides that the objective of the Convention is to ensure the long-term conservation and sustainable use of the fisheries resources in the Convention Area while protecting the marine ecosystems of the North Pacific Ocean in which these resources occur;

*Recognizing further* Articles 3 (c) and (e) of the Convention, which call on the Commission to adopt and implement measures in accordance with the precautionary approach and ecosystem approach to fisheries and protect biodiversity in the marine environment, including by preventing significant adverse impacts on vulnerable marine ecosystems;

*Re-affirming* NPFC's commitment to the precautionary approach and to implementing an ecosystem approach to fisheries management;

*Noting* the ongoing work of the Scientific Committee to address the FAO International Guidelines for the Management of Deep-Sea Fisheries in the High Seas, including the identification of VMEs;

*Underscoring* the ecological importance of the Emperor Seamounts to the fisheries resources and biodiversity of the NPFC convention area;

*Adopts* the following Conservation and Management Measure:

### **Scope**

1. This CMM applies to all bottom fishing activities for fisheries resources throughout the high seas areas of the Northwestern Pacific Ocean, defined, for the purposes of this document, as those occurring in the Convention Area as set out in Article 4 of the Convention text to the west of the line of 175 degrees W longitude (hereinafter called “the western part of the Convention Area”).

### **General purpose**

2. The objective of this CMM is to ensure the long-term conservation and sustainable use of the fisheries resources in the Convention Area while protecting the marine ecosystems of the North Pacific Ocean in which these resources occur. The measures in this CMM aim to prevent significant adverse impacts on VMEs in the Convention Area of the North Pacific Ocean, acknowledging the complex dependency of fishing resources and species belonging to the same ecosystem within VMEs. The Commission shall regularly review, and as appropriate, revise this CMM considering the best available science and the recommendations of the NPFC Scientific Committee, and with reference to relevant guidance adopted by UNGA and FAO.

### **Principles**

3. The implementation of this CMM shall:

- (a) be based on the best scientific information available,
- (b) be in accordance with existing international laws and agreements including UNCLOS and other relevant international instruments,
- (c) establish appropriate and effective conservation and management measures,
- (d) be in accordance with the precautionary approach, and
- (e) incorporate an ecosystem approach to fisheries management.

## Measures

4. Members of the Commission shall implement the following measures in order to achieve sustainable management of fish stocks and protection of VMEs in the western part of the Convention Area:

- A. Limit fishing effort in bottom fisheries on the western part of the Convention Area to the level agreed in February 2007 in terms of the number of fishing vessels and other parameters which reflect the level of fishing effort, fishing capacity or potential impacts on marine ecosystems.
- B. Not allow bottom fisheries to expand into the western part of the Convention Area where no such fishing is currently occurring, in particular, by limiting such bottom fisheries to seamounts located south of 45 degrees North Latitude and not allow bottom fisheries in other areas of the western part of the Convention Area covered by these measures and also not allow bottom fisheries to conduct fishing operation in areas deeper than 1,500m.
- C. Notwithstanding subparagraphs A and B above, exceptions to these restrictions may be provided in cases where it can be shown that any fishing activity beyond such limits or in any new areas would not have significant adverse impacts (SAIs) on marine species or any VME. Such fishing activity is subject to an exploratory fishery protocol (Annex 1).
- D. Any determinations pursuant to subparagraph C that any proposed fishing activity will not have SAIs on marine species or any VME are to be in accordance with the Science-based Standards and Criteria (Annex 2), which are consistent with the FAO International Guidelines for the Management of Deepsea Fisheries in the High Seas.
- E. Any determinations, by any flag State or pursuant to any subsequent arrangement for the management of the bottom fisheries in the areas covered by these measures, that fishing activity would not have SAIs on marine species or any VMEs, shall be made publicly available through agreed means.

- F. Prohibit its vessels from engaging in directed fishing on the following taxa: black coral (Antipatharia), gorgonians, pennatulaceans, stony corals (Scleractinia), soft corals, the classes of Hexactinellida and Demospongiae in the phylum Porifera as well as any other indicator species for VMEs as may be identified from time to time by the SC and approved by the Commission. The translation table of VME indicator corals between common and scientific names is attached to the VME taxa identification guide ([link](#)) [to this CMM (Annex 7)].
- G. Further, considering accumulated information regarding fishing activities in the western part of the Convention Area, in areas where, in the course of fishing operations, cold water corals more than 50Kg or sponges more than 350Kg are encountered in one gear retrieval, Members of the Commission shall require vessels flying their flag to cease bottom fishing activities in that location. In such cases, the vessel shall not resume fishing activities until it has relocated a sufficient distance, which shall be no less than 1 nautical mile, so that additional encounters with VMEs are unlikely. All such encounters, including the location, gear type, date, time and name and weight of the VME indicator species, shall be reported to the Secretariat, through the Member, within one business day. The Executive Secretary shall, within one business day, notify the other Members of the Commission and at the same time implement a temporary closure in the area to prohibit fishing vessels from contacting the sea floor with their fishing gear. Members shall inform their fleets and enforcement operations within one business day of the receipt of the notification from the Executive Secretary. It is agreed that the VME indicator taxa include five groups of cold water corals, specifically black corals (Antipatharia), gorgonians, pennatulaceans, stony coral (Scleractinia), and soft corals. The VME indicator taxa also include the classes of Hexactinellida and Demospongiae in the phylum Porifera.
- H. Based on all the available data, including data on the VME encounter and distribution received from the fishing vessel(s), research survey data, visual survey data, and/or model results, the Scientific Committee (SC) shall assess and conclude if the area has a VME. If so, the SC shall recommend to the Commission that the temporary closure be made permanent, although the boundary of the closure may be adjusted, or suggest other appropriate measures. Otherwise, the Executive Secretary shall inform the Members that they may reopen the area to their vessels.

- I. C-H seamount, the Southeastern part of Koko seamount (specifically, the area South of 34 degrees 57 minutes North, East of the 400m isobaths, East of 171 degrees 54 minutes East, North of 34 degrees 50 minutes North), are closed to prevent potential significant adverse impacts on VMEs consistent with the precautionary approach. Fishing in these areas requires exploratory fishery protocol (Annex 1).
- J. Ensure that the distance between the footrope of the gill net and sea floor is greater than 70 cm.
- K. Apply a bottom fisheries closure from November to January.
- L. Limit annual catch of North Pacific armorhead consistent with the precautionary approach. In years when strong recruitment of North Pacific armorhead is not detected by the monitoring survey (Annex 6), Japan shall limit the catch of North Pacific armorhead by vessels flying its flag to 500 tons, and Korea shall limit its catch of North Pacific armorhead by vessels flying its flag to 200 tons. When a strong recruitment of North Pacific armorhead is detected by the monitoring survey (Annex 6), Japan shall limit its annual catch of North Pacific armorhead by vessels flying its flag to 10,000 tons, and Korea shall limit its annual catch of North Pacific armorhead by vessels flying its flag to 2,000 tons. The catch overages for any given year shall be subtracted from the applicable annual catch limit in the following year, and catch underages during any given year shall not be added to the applicable annual catch limit during the following year.
- M. During a year when high recruitment is detected, bottom fishing with trawl gear shall be prohibited in specific areas in the Emperor seamounts where half of the catch occurred in 2010 and 2012 (Annex 6). Determination of a strong recruitment year and of the specific areas where bottom fishing with trawl gear is prohibited shall be communicated to all Members and Cooperating Non-Contracting Parties following the procedure specified in Annex 6.
- N. Catch in the monitoring surveys shall not be included in the catch limits specified in paragraphs L but shall be reported to the Secretariat.

- O. Development of new fishing activity for the North Pacific armorhead and splendid alfonsino in the Convention Area by Members without documented historical catch for North Pacific armorhead and splendid alfonsino in the Convention Area shall be determined in accordance with relevant provisions, including but not limited to Article 3, paragraph (h) and Article 7, subparagraphs 1(g) and (h) of the Convention.
- P. Fishing activity for the North Pacific armorhead and splendid alfonsino in the Convention Area by Members with documented historical catch for North Pacific armorhead and splendid alfonsino in the Convention Area is not precluded.
- Q. Members shall require vessels flying their flags to use trawl nets with mesh size greater than or equal to 130mm of stretched mesh with 5kg tension in the codend when conducting fishing activities for North Pacific armorhead or splendid alfonsino.
- R. Task the Scientific Committee with reviewing the appropriate methods for establishing catch limits, and the adequacy and practicability of the adaptive management plan described in subparagraphs K, L, M, N, O, P, Q and Annex 6 from time to time and recommending revisions and actions, if necessary.
- S. Prohibit its bottom fishing vessels from contacting the sea floor with their fishing gear in the following ~~two-four~~ sites with VME indicator species. A Member of the Commission whose fishing vessels entered these areas shall report to the TCC as to how it ensured the compliance of this measure.

Sites with VME indicator species (Areas surrounded by the straight lines linking the 4 geographical points below)

Northwestern part of Koko Seamount	35-44.75 N 171-07.60 E	35-44.75 N 171-07.80 E
	35-43.80 N 171-07.80 E	35-43.80 N 171-08.00 E
Northern Ridge of Colahan Seamount	31-03.85 N 175-53.40 E	31-03.85 N 175-53.65 E
	31-03.5 N 175-53.50 E	31-03.05 N 175-53.85 E
<u>Northwestern part of</u>	<u>32-42.75 N 172-12.90 E</u>	<u>32-42.75 N 172-13.65 E</u>



<u>Yuryaku Seamount</u>	<u>32-43.50 N 172-13.65 E</u>	<u>32-43.50 N 172-12.90 E</u>
<u>Southeastern part of</u>	<u>32-37.80 N 172-18.00 E</u>	<u>32-37.80 N 172-18.60 E</u>
<u>Yuryaku Seamount</u>	<u>32-38.40 N 172-18.60 E</u>	<u>32-38.40 N 172-18.00 E</u>

### **Contingent Action**

5. Members of the Commission shall submit to the SC their assessments of the impacts of fishing activity on marine species or any VMEs, including the proposed management measures to prevent such impact. Such submissions shall include all relevant data and information in support of any such assessment. Procedures for such reviews including procedures for the provision of advice and recommendations from the SC to the submitting Member are attached (Annex 3). Members will only authorize bottom fishing activity pursuant to paragraph 4 (C).

### **Scientific Information**

6. To facilitate the scientific work associated with the implementation of these measures, each Member of the Commission shall undertake:
  - A. Reporting of information for purposes of defining the footprint
 

Members of the Commission shall provide, for each year, the number of vessels by gear type, size of vessels (tons), number of fishing days or days on the fishing grounds, total catch by species, and areas fished (names of seamounts) to the Secretariat. The Secretariat shall circulate the information received to the other Members consistent with the approved Regulations for Management of Scientific Data and Information. To support assessments of the fisheries and refinement of conservation and management measures, Members of the Commission are to provide updated information on an annual basis.
  - B. Collection of information
    - (i) Members shall ensure each bottom fishing vessel operating in the western part of the Convention Area collects the following scientific information. Members shall provide the scientific information to the Secretariat.
      - (a) Catch and effort data
      - (b) Related information such as time, location, depth, temperature, etc.

- (ii) As appropriate, Members should encourage the collection of information from research vessels operating in the western part of the Convention Area and provide updates to the Commission to the extent possible.
  - (a) Physical, chemical, biological, oceanographic, meteorological, etc.
  - (b) Ecosystem surveys.
  - (c) Seabed mapping (e.g. multibeam or other echosounder); seafloor images by drop camera, remotely operated underwater vehicle (ROV) and/or autonomous underwater vehicle (AUV).
- (iii) Collection of observer data

Duly designated observers from the flag member shall collect information from bottom fishing vessels operating in the western part of the Convention Area. Observers shall collect data in accordance with Annex 5. Each Member of the Commission shall submit the reports to the Secretariat in accordance with Annex 4. The Secretariat shall compile this information on an annual basis and make it available to the Members of the Commission.

### **Vessel Monitoring System**

- 7. To strengthen its control over bottom fishing vessels flying its flag, each Member of the Commission shall ensure that all such vessels operating in the western part of the Convention Area be equipped with an operational vessel monitoring system.

### **Observers**

- 8. Members shall ensure that all vessels authorized to bottom fish in the western part of the Convention Area shall carry an observer on board. Members shall ensure that observers are independent, impartial, and qualified to fulfill the requirements of this measure and to enhance data collection. An observer is deemed to be independent, impartial, and qualified if the observer:
  - (a) is deployed from a Commission Member's, or Cooperating non-Contracting Party's, national observer program, and familiar with NPFC fisheries resources, fishing activities, and CMMs;
  - (b) is neither part of the crew, nor has any employment or family relationship to the

ownership or operator of the fishing vessel; and

(c) does not have any shared business interests with the owner or operator of the fishing vessel.

An observer shall be provisioned, accommodated, and provided safe working conditions and access to independent communications in accordance with the Commission requirements and the Member's domestic laws and regulations.

## **Final Clauses**

9. This CMM shall enter into force on January 1st, 2025, replacing CMM 2023-05.

## **EXPLORATORY FISHERY PROTOCOL IN THE NORTH PACIFIC OCEAN**

1. From 1 January 2009, all bottom fishing activities in new fishing areas and areas where fishing is prohibited in a precautionary manner or with bottom gear not previously used in the existing fishing areas, are to be considered as “exploratory fisheries” and to be conducted in accordance with this protocol.
2. Precautionary conservation and management measures, including catch and effort controls, are essential during the exploratory phase of deep sea fisheries. Implementation of a precautionary approach to sustainable exploitation of deep sea fisheries shall include the following measures:
  - (i) precautionary effort limits, particularly where reliable assessments of sustainable exploitation rates of target and main by-catch species are not available;
  - (ii) precautionary measures, including precautionary spatial catch limits where appropriate, to prevent serial depletion of low-productivity stocks;
  - (iii) regular review of appropriate indices of stock status and revision downwards of the limits listed above when significant declines are detected;
  - (iv) measures to prevent significant adverse impacts on vulnerable marine ecosystems; and
  - (v) comprehensive monitoring of all fishing effort, capture of all species and interactions with VMEs.
3. When a member of the Commission would like to conduct exploratory fisheries, it is to follow the following procedure:
  - (i) Prior to the commencement of fishing, the member of the Commission is to circulate the information and assessment in Appendix 1.1 to the members of the Scientific Committee (SC) for review and to all members of the Commission for information, together with the impact assessment. Such information is to be provided to the other members at least 30 days in advance of the meeting at which the information shall be reviewed.
  - (ii) The assessment in (i) above is to be conducted in accordance with the procedure set forth in “Science-based Standards and Criteria for Identification of VMEs and Assessment of Significant Adverse Impacts on VMEs and Marine Species (Annex 2)”, with the understanding that particular care shall be taken in the evaluation of risks of the significant

adverse impact on vulnerable marine ecosystems (VMEs), in line with the precautionary approach.

(iii) The SC is to review the information and the assessment submitted in (i) above in accordance with “SC Assessment Review Procedures for Bottom Fishing Activities (Annex 3).”

(iv) The exploratory fisheries are to be permitted only where the assessment concludes that they would not have significant adverse impacts (SAIs) on marine species or any VMEs and on the basis of comments and recommendations of SC. Any determinations, by any Member of the Commission or the SC, that the exploratory fishing activities would not have SAIs on marine species or any VMEs, shall be made publicly available through the NPFC website.

4. The member of the Commission is to ensure that all vessels flying its flag conducting exploratory fisheries are equipped with a satellite monitoring device and have an observer on board at all times.
5. Within 3 months of the end of the exploratory fishing activities or within 12 months of the commencement of fishing, whichever occurs first, the member of the Commission is to provide a report of the results of such activities to the members of the SC and all members of the Commission. If the SC meets prior to the end of this 12-month period, the member of the Commission is to provide an interim report 30 days in advance of the SC meeting. The information to be included in the report is specified in Appendix 1.2.
6. The SC is to review the report in 5 above and decide whether the exploratory fishing activities had SAIs on marine species or any VME. The SC then is to send its recommendations to the Commission on whether the exploratory fisheries can continue and whether additional management measures shall be required if they are to continue. The Commission is to strive to adopt conservation and management measures to prevent SAIs on marine species or any VMEs. If the Commission is not able to reach consensus on any such measures, each fishing member of the Commission is to adopt measures to avoid any SAIs on VMEs.
7. Members of the Commission shall only authorize continuation of exploratory fishing activity, or commencement of commercial fishing activity, under this protocol on the basis of comments and recommendations of the SC.

8. The same encounter protocol should be applied in both fished and unfished areas specified in Annex 2, paragraph 4(1)(a).

## **Appendix 1.1**

### **Information to be provided before exploratory fisheries start**

#### **1. A harvesting plan**

- Name of vessel
- Flag member of vessel
- Description of area to be fished (location and depth)
- Fishing dates
- Anticipated effort
- Target species
- Bottom fishing gear-type used
- Area and effort restrictions to ensure that fisheries occur on a gradual basis in a limited geographical area.

#### **2. A mitigation plan**

- Measures to prevent SAIs to VMEs that may be encountered during the fishery

#### **3. A catch monitoring plan**

- Recording/reporting of all species brought onboard to the lowest possible taxonomic level
- 100% satellite monitoring
- 100% observer coverage

#### **4. A data collection plan**

- Data is to be collected in accordance with “Type and Format of Scientific Observer Data to be Collected” (Annex 5)

## **Appendix 1.2**

### **Information to be included in the report**

- Name of vessel
- Flag member of vessel
- Description of area fished (location and depth)
- Fishing dates
- Total effort
- Bottom fishing gear-type used
- List of VME encountered (the amount of VME indicator species for each encounter specifying the location: longitude and latitude)
- Mitigation measures taken in response to the encounter of VME
- List of all organisms brought onboard
- List of VMEs indicator species brought onboard by location: longitude and latitude

## **SCIENCE-BASED STANDARDS AND CRITERIA FOR IDENTIFICATION OF VMES AND ASSESSMENT OF SIGNIFICANT ADVERSE IMPACTS ON VMES AND MARINE SPECIES**

### **1. Introduction**

Members of the Commission have hereby established science-based standards and criteria to guide their implementation of United Nations General Assembly (UNGA) Resolution 61/105 and the measures adopted by the Members in respect of bottom fishing activities in the North Pacific Ocean (NPO). In this regard, these science-based standards and criteria are to be applied to identify vulnerable marine ecosystems (VMEs) and assess significant adverse impacts (SAIs) of bottom fishing activities on such VMEs or marine species and to promote the long-term sustainability of deep sea fisheries in the Convention Area. The science-based standards and criteria are consistent with the FAO International Guidelines for the Management of Deep-Sea Fisheries in the High Seas, taking into account the work of other RFMOs implementing management of deep-sea bottom fisheries in accordance with UNGA Resolution 61/105. The standards and criteria are to be modified from time to time as more data are collected through research activities and monitoring of fishing operations.

### **2. Purpose**

- (1) The purpose of the standards and criteria is to provide guidelines for each member of the Commission in identifying VMEs and assessing SAIs of individual bottom fishing activities<sup>1</sup> on VMEs or marine species in the Convention Area. Each member of the Commission, using the best information available, is to decide which species or areas are to be categorized as VMEs, identify areas where VMEs are known or likely to occur, and assess whether individual bottom fishing activities would have SAIs on such VMEs or marine species. The results of these tasks are to be submitted to and reviewed by the Scientific Committee with a view to reaching a common understanding among the members of the

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<sup>1</sup> “individual bottom fishing activities” means fishing activities by each fishing gear. For example, if ten fishing vessels operate bottom trawl fishing in a certain area, the impacts of the fishing activities of these vessels on the ecosystem are to be assessed as a whole rather than on a vessel-by-vessel basis. It should be noted that if the total number or capacity of the vessels using the same fishing gear has increased, the impacts of the fishing activities are to be assessed again.



Commission.

- (2) For the purpose of applying the standards and criteria, the bottom fisheries are defined as follows:
  - (a) The fisheries are conducted in the Convention Area;
  - (b) The total catch (everything brought up by the fishing gear) includes species that can only sustain low exploitation rates; and
  - (c) The fishing gear is likely to contact the seafloor during the normal course of fishing operations.

### 3. Definition of VMEs

- (1) Although Paragraph 83 of UNGA Resolution 61/105 refers to seamounts, hydrothermal vents and cold-water corals as examples of VMEs, there is no definitive list of specific species or areas that are to be regarded as VMEs.
- (2) Vulnerability is related to the likelihood that a population, community or habitat will experience substantial alteration by fishing activities and how much time will be required for its recovery from such alteration. The most vulnerable ecosystems are those that are both easily disturbed and are very slow to recover or may never recover. The vulnerabilities of populations, communities and habitats are to be assessed relative to specific threats. Some features, particularly ones that are physically fragile or inherently rare may be vulnerable to most forms of disturbance, but the vulnerability of some populations, communities and habitats may vary greatly depending on the type of fishing gear used or the kind of disturbance experienced. The risks to a marine ecosystem are determined by its vulnerability, the probability of a threat occurring and the mitigation means applied to the threat. Accordingly, the FAO Guidelines only provide examples of potential vulnerable species groups, communities and habitats as well as features that potentially support them (Annex 2.1).
- (3) A marine ecosystem is to be classified as vulnerable based on its characteristics. The following list of characteristics is used as criteria in the identification of VMEs.
  - (a) Uniqueness or rarity - an area or ecosystem that is unique or that contains rare species whose loss could not be compensated for by other similar areas. These include:
    - (i) Habitats that contain endemic species;
    - (ii) Habitats of rare, threatened or endangered species that occur in discrete areas;
    - (iii) Nurseries or discrete feeding, breeding, or spawning areas.

- (b) Functional significance of the habitat – discrete areas or habitats that are necessary for the survival, function, spawning/reproduction or recovery of fish stocks, particular life-history stages (e.g. nursery grounds or rearing areas), or of rare, threatened or endangered marine species.
  - (c) Fragility – an ecosystem that is highly susceptible to degradation by anthropogenic activities
  - (d) Life-history traits of component species that make recovery difficult – ecosystems that are characterized by populations or assemblages of species with one or more of the following characteristics:
    - (i) Slow growth rates
    - (ii) Late age of maturity
    - (iii) Low or unpredictable recruitment
    - (iv) Long-lived
  - (e) Structural complexity – an ecosystem that is characterized by complex physical structures created by significant concentrations of biotic and abiotic features. In these ecosystems, ecological processes are usually highly dependent on these structured systems. Further, such ecosystems often have high diversity, which is dependent on the structuring organisms.
- (4) Management response may vary, depending on the size of the ecological unit in the Convention Area. Therefore, the spatial extent of the ecological unit is to be decided first. That is, whether the ecological unit is the entire Area, or the current fishing ground, namely, the Emperor Seamount and Northern Hawaiian Ridge area (hereinafter called “the ES-NHR area”), or a group of the seamounts within the ESNHR area, or each seamount in the ES-NHR area, is to be decided using the above criteria.

#### 4. Identification of potential VMEs

##### (1) Fished seamounts

##### (a) Identification of fished seamounts

It is reported that four types of fishing gear are currently used by the members of the Commission in the ES-NHR area, namely, bottom trawl, bottom gillnet, bottom longline and pot. A fifth type of fishing gear (coral drag) was used in the ES-NHR area from the mid-1960s to the late 1980s and is possibly still used by non-members of the

Commission. These types of fishing gear are usually used on the top or slope of seamounts, which could be considered VMEs. It is therefore necessary to identify the footprint of the bottom fisheries (fished seamounts) based on the available fishing record. The following seamounts have been identified as fished seamounts: Suiko, Showa, Youmei, Nintoku, Jingu, Ojin, Northern Koko, Koko, Kinmei, Yuryaku, Kammu, Colahan, and CH. Since the use of most of these gears in the ES-NHR area dates back to the late 1960s and 1970s, it is important to establish, to the extent practicable, a time series of where and when these gears have been used in order to assess potential long-term effects on any existing VMEs.

Fishing effort may not be evenly distributed on each seamount since fish aggregation may occur only at certain points of the seamount and some parts of the seamount may be physically unsuitable for certain fishing gears. Thus, it is important to know actual fished areas within the same seamount so as to know the gravity of the impact of fishing activities on the entire seamount.

Due consideration is to be given to the protection of commercial confidentiality when identifying actual fishing grounds.

(b) Assessment on whether a specific seamount that has been fished is a VME

After identifying the fished seamounts or fished areas of seamounts, it is necessary to assess whether each fished seamount is a VME or contains VMEs in accordance with the criteria in 3 above, individually or in combination using the best available scientific and technical information as well as Annex 2.1. A variety of data would be required to conduct such assessment, including pictures of seamounts taken by an ROV camera or drop camera, biological samples collected through research activities and observer programs, and detailed bathymetry map. Where site-specific information is lacking, other information that is relevant to inferring the likely presence of VMEs is to be used. The flow chart to identify data that can be used to identify VMEs is attached in Annex 2.3.

(2) New fishing areas

Any place other than the fished seamounts above is to be regarded as a new fishing area. If a member of the Commission is considering fishing in a new fishing area, such a fishing area is to be subject to, in addition to these standards and criteria, an exploratory fishery protocol (Annex 1).

## 5. Assessment of SAIs on VMEs or marine species

- (1) Significant adverse impacts are those that compromise ecosystem integrity (i.e., ecosystem structure or function) in a manner that: (i) impairs the ability of affected populations to replace themselves; (ii) degrades the long-term natural productivity of habitats; or (iii) causes, on more than a temporary basis, significant loss of species richness, habitat or community types. Impacts are to be evaluated individually, in combination and cumulatively.
- (2) When determining the scale and significance of an impact, the following six factors are to be considered:
  - (a) The intensity or severity of the impact at the specific site being affected;
  - (b) The spatial extent of the impact relative to the availability of the habitat type affected;
  - (c) The sensitivity/vulnerability of the ecosystem to the impact;
  - (d) The ability of an ecosystem to recover from harm, and the rate of such recovery;
  - (e) The extent to which ecosystem functions may be altered by the impact; and
  - (f) The timing and duration of the impact relative to the period in which a species needs the habitat during one or more life-history stages.
- (3) Temporary impacts are those that are limited in duration and that allow the particular ecosystem to recover over an acceptable timeframe. Such timeframes are to be decided on a case-by-case basis and be on the order of 5-20 years, taking into account the specific features of the populations and ecosystems.
- (4) In determining whether an impact is temporary, both the duration and the frequency with which an impact is repeated is to be considered. If the interval between the expected disturbances of a habitat is shorter than the recovery time, the impact is to be considered more than temporary.
- (5) Each member of the Commission is to conduct assessments to establish if bottom fishing activities are likely to produce SAIs in a given seamount or other VMEs. Such an impact assessment is to address, *inter alia*:
  - (a) Type of fishing conducted or contemplated, including vessel and gear types, fishing areas, target and potential bycatch species, fishing effort levels and duration of fishing;
  - (b) Best available scientific and technical information on the current state of fishery resources, and baseline information on the ecosystems, habitats and communities in the fishing area, against which future changes are to be compared;

- (c) Identification, description and mapping of VMEs known or likely to occur in the fishing area;
  - (d) The data and methods used to identify, describe and assess the impacts of the activity, identification of gaps in knowledge, and an evaluation of uncertainties in the information presented in the assessment;
  - (e) Identification, description and evaluation of the occurrence, scale and duration of likely impacts, including cumulative impacts of activities covered by the assessment on VMEs and low-productivity fishery resources in the fishing area;
  - (f) Risk assessment of likely impacts by the fishing operations to determine which impacts are likely to be SAIs, particularly impacts on VMEs and low-productivity fishery resources (Risk assessments are to take into account, as appropriate, differing conditions prevailing in areas where fisheries are well established and in areas where fisheries have not taken place or only occur occasionally);
  - (g) The proposed mitigation and management measures to be used to prevent SAIs on VMEs and ensure long-term conservation and sustainable utilization of low-productivity fishery resources, and the measures to be used to monitor effects of the fishing operations.
- (6) Impact assessments are to consider, as appropriate, the information referred to in these Standards and Criteria, as well as relevant information from similar or related fisheries, species and ecosystems.
- (7) Where an assessment concludes that the area does not contain VMEs or that significant adverse impacts on VMEs or marine species are not likely, such assessments are to be repeated when there have been significant changes to the fishery or other activities in the area, or when natural processes are thought to have undergone significant changes.

#### 6. Proposed conservation and management measures to prevent SAIs

As a result of the assessment in 5 above, if it is considered that individual fishing activities are causing or likely to cause SAIs on VMEs or marine species, the member of the Commission is to adopt appropriate conservation and management measures to prevent such SAIs. The member of the Commission is to clearly indicate how such impacts are expected to be prevented or mitigated by the measures.

#### 7. Precautionary approach

If after assessing all available scientific and technical information, the presence of VMEs or the

likelihood that individual bottom fishing activities would cause SAIs on VMEs or marine species cannot be adequately determined, members of the Commission are only to authorize individual bottom fishing activities to proceed in accordance with:

- (a) Precautionary, conservation and management measures to prevent SAIs;
- (b) Measures to address unexpected encounters with VMEs in the course of fishing operations;
- (c) Measures, including ongoing scientific research, monitoring and data collection, to reduce the uncertainty; and
- (d) Measures to ensure long-term sustainability of deep sea fisheries.

#### 8. Template for assessment report

Annex 2.2 is a template for individual member of the Commission to formulate reports on identification of VMEs and impact assessment.

### **Annex 2.1**

#### **Examples of potential vulnerable species groups, communities and habitats as well as features that potentially support them**

The following examples of species groups, communities, habitats and features often display characteristics consistent with possible VMEs. Merely detecting the presence of an element itself is not sufficient to identify a VME. That identification is to be made on a case-by-case basis through application of relevant provisions of the Standards and Criteria, particularly Sections 3, 4 and 5.

Examples of species groups, communities and habitat forming species that are documented or considered sensitive and potentially vulnerable to deep-sea fisheries in the high-seas, and which may contribute to forming VMEs:	
a.	certain cold-water corals, e.g., reef builders and coral forest including: stony corals (Scleractinia), gorgonians, black corals (Antipatharia), and hydrocorals (stylasteridae),
b.	Some types of sponge dominated communities,
c.	communities composed of dense emergent fauna where large sessile protozoans (xenophyophores) and invertebrates (e.g., hydroids and bryozoans) form an important structural component of habitat, and

d.	seep and vent communities comprised of invertebrate and microbial species found nowhere else (i.e., endemic).
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Examples of topographical, hydrophysical or geological features, including fragile geological structures, that potentially support the species groups or communities referred to above:

- a. submerged edges and slopes (e.g., corals and sponges)
- b. summits and flanks of seamounts, guyots, banks, knolls, and hills (e.g., corals, sponges and xenophyphores)
- c. canyons and trenches (e.g., burrowed clay outcrops, corals),
- d. hydrothermal vents (e.g., microbial communities and endemic invertebrates), and
- e. cold seeps (e.g., mud volcanoes, microbes, hard substrates for sessile invertebrates).

## Annex 2.2

### **Template for reports on identification of VMEs and assessment of impacts caused by individual fishing activities on VMEs or marine species**

1. Name of the member of the Commission
2. Name of the fishery (e.g., bottom trawl, bottom gillnet, bottom longline, pot)
3. Status of the fishery (existing fishery or exploratory fishery)
4. Target species
5. Bycatch species
6. Recent level of fishing effort (every year at least since 2002)
  - (1) Number of fishing vessels
  - (2) Tonnage of each fishing vessel
  - (3) Number of fishing days or days on the fishing ground
  - (4) Fishing effort (total operating hours for trawl, # of hooks per day for long-line, # of pots)

per day for pot, total length of net per day for gillnet)

(5) Total catch by species

(6) Names of seamounts fished or to be fished

7. Fishing period

8. Analysis of status of fishery resources

(1) Data and methods used for analysis

(2) Results of analysis

(3) Identification of uncertainties in data and methods, and measures to overcome such uncertainties

9. Analysis of status of bycatch species resources

(1) Data and methods used for analysis

(2) Results of analysis

(3) Identification of uncertainties in data and methods, and measures to overcome such uncertainties

10. Analysis of existence of VMEs in the fishing ground

(1) Data and methods used for analysis

(2) Results of analysis

(3) Identification of uncertainties in data and methods, and measures to overcome such uncertainties

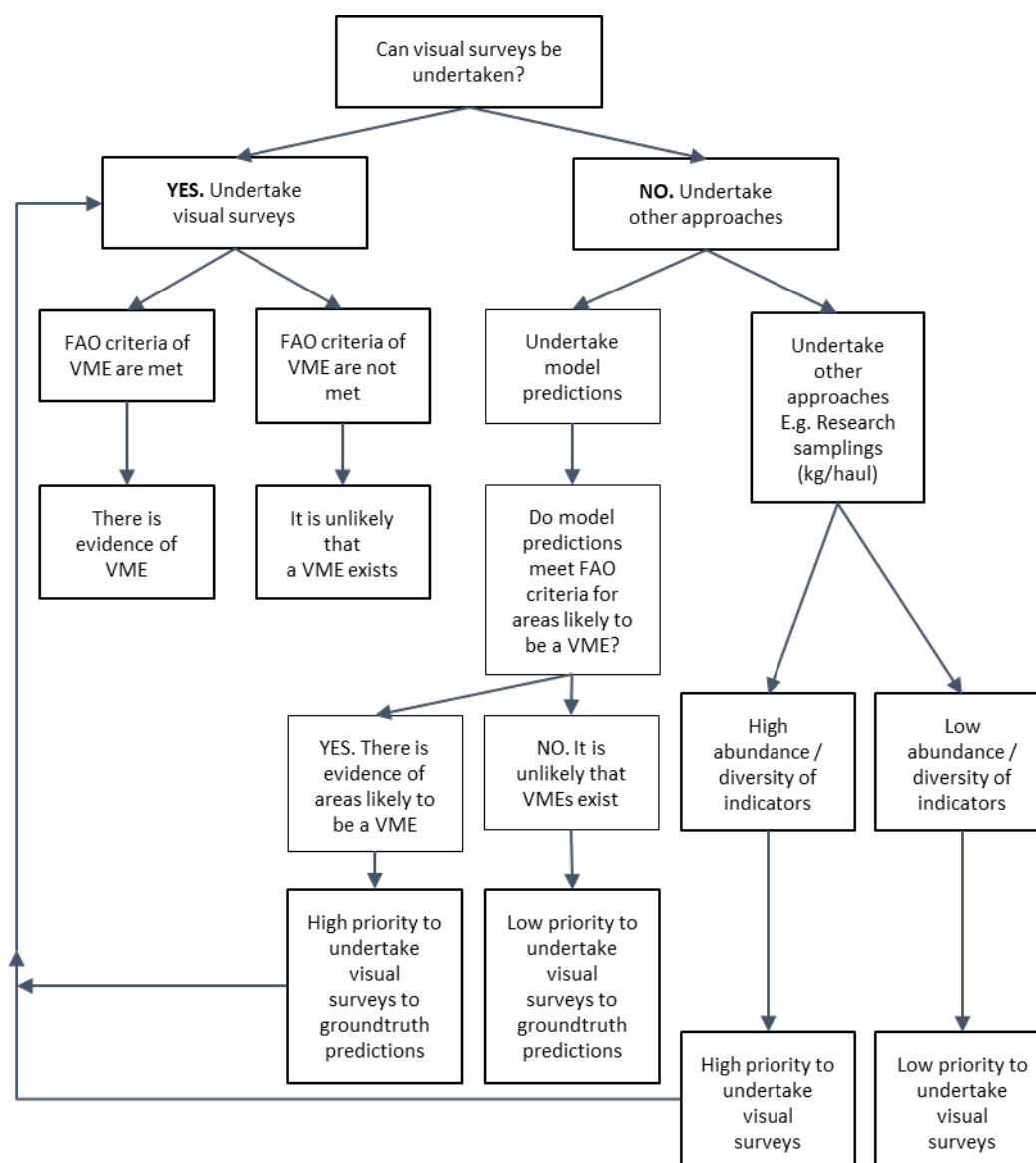
11. Impact assessment of fishing activities on VMEs or marine species including cumulative impacts, and identification of SAIs on VMEs or marine species, as detailed in Section 5 above, Assessment of SAIs on VMEs or marine species

12. Other points to be addressed

13. Conclusion (whether to continue or start fishing with what measures, or stop fishing).



# Flow chart to identify data that can be used to identify VMEs in the NPFC Convention Area



**SCIENTIFIC COMMITTEE ASSESSMENT REVIEW PROCEDURES FOR BOTTOM  
FISHING ACTIVITIES**

1. The Scientific Committee (SC) is to review identifications of vulnerable marine ecosystems (VMEs) and assessments of significant adverse impact on VMEs, including proposed management measures intended to prevent such impacts submitted by individual Members.
2. Members of the Commission shall submit their identifications and assessments to members of the SC at least 21 days prior to the SC meeting at which the review is to take place. Such submissions shall include all relevant data and information in support of such determinations.
3. The SC will review the data and information in each assessment in accordance with the Science-based Standards and Criteria for Identification of VMEs and Assessment of Significant Adverse Impacts on VMEs and Marine Species (Annex 2), previous decisions of the Commission, and the FAO Technical Guidelines for the Management of Deep Sea Fisheries in the High Seas, paying special attention to the assessment process and criteria specified in paragraphs 47-49 of the Guidelines.
4. In conducting the review above, the SC will give particular attention to whether the deep-sea bottom fishing activity would have a significant adverse impact on VMEs and marine species and, if so, whether the proposed management measures would prevent such impacts.
5. Based on the above review, the SC will provide advice and recommendations to the submitting Members on the extent to which the assessments and related determinations are consistent with the procedures and criteria established in the documents identified above; and whether additional management measures will be required to prevent SAIs on VMEs.
6. Such recommendations will be reflected in the report of the SC meeting at which the assessments are considered.

## **FORMAT OF NATIONAL REPORT SECTIONS ON DEVELOPMENT AND IMPLEMENTATION OF SCIENTIFIC OBSERVER PROGRAMMES**

### **Report Components**

Annual Observer Programme implementation reports should form a component of annual National Reports submitted by members to the Scientific Committee. These reports should provide a brief overview of observer programmes conducted in the NPFC Convention Area. Observer programme reports should include the following sections:

#### **A. Observer Training**

An overview of observer training conducted, including:

- Overview of training programme provided to scientific observers.
- Number of observers trained.

#### **B. Scientific Observer Programme Design and Coverage**

Details of the design of the observer programme, including:

- Which fleets, fleet components or fishery components were covered by the programme.
- How vessels were selected to carry observers within the above fleets or components.
- How was observer coverage stratified: by fleets, fisheries components, vessel types, vessel sizes, vessel ages, fishing areas and seasons.

Details of observer coverage of the above fleets, including:

- Components, areas, seasons and proportion of total catches of target species, specifying units used to determine coverage.
- Total number of observer employment days, and number of actual days deployed on observation work.

#### **C. Observer Data Collected**

List of observer data collected against the agreed range of data set out in Annex 5, including:

- Effort Data: Amount of effort observed (vessel days, net panels, hooks, etc), by area and season and % observed out of total by area and seasons
- Catch Data: Amount of catch observed of target and by-catch species, by area and season, and % observed out of total estimated catch by species, area and seasons
- Length Frequency Data: Number of fish measured per species, by area and season.
- Biological Data: Type and quantity of other biological data or samples (otoliths, sex, maturity, etc.) collected per species.
- The size of length-frequency and biological sub-samples relative to unobserved quantities.

#### **D. Detection of Fishing in Association with Vulnerable Marine Ecosystems**

- Information about VME encounters (species and quantity in accordance with Annex 5, H, 2).

#### **E. Tag Return Monitoring**

- Number of tags returns observed, by fish size class and area.

#### **F. Problems Experienced**

- Summary of problems encountered by observers and observer managers that could affect the NPFC Observer Programme Standards and/or each member's national observer programme developed under the NPFC standards.

## **NPFC BOTTOM FISHERIES OBSERVER PROGRAMME STANDARDS: SCIENTIFIC COMPONENT**

### **TYPE AND FORMAT OF SCIENTIFIC OBSERVER DATA TO BE COLLECTED**

#### **A. Vessel & Observer Data to be collected for Each Trip**

1. Vessel and observer details are to be recorded only once for each observed trip.
2. The following observer data are to be collected for each observed trip:
  - (a) NPFC vessel ID.
  - (b) Observer's name.
  - (c) Observer's organisation.
  - (d) Date observer embarked (UTC date).
  - (e) Port of embarkation.
  - (f) Date observer disembarked (UTC date).
  - (g) Port of disembarkation.

#### **B. Catch & Effort Data to be collected for Trawl Fishing Activity**

1. Data are to be collected on an un-aggregated (tow by tow) basis for all observed trawls.
2. The following data are to be collected for each observed trawl tow:
  - (a) Tow start date (UTC).
  - (b) Tow start time (UTC).
  - (c) Tow end date (UTC).
  - (d) Tow end time (UTC).
  - (e) Tow start position (Lat/Lon, 1 minute resolution).
  - (f) Tow end position (Lat/Lon, 1 minute resolution).
  - (g) Type of trawl, bottom or mid-water.
  - (h) Type of trawl, single, double or triple.
  - (i) Height of net opening (m).
  - (j) Width of net opening (m).

- (k) Mesh size of the cod-end net (stretched mesh, mm) and mesh type (diamond, square, etc).
  - (l) Gear depth (of footrope) at start of fishing (m).
  - (m) Bottom (seabed) depth at start of fishing (m).
  - (n) Gear depth (of footrope) at end of fishing (m).
  - (o) Bottom (seabed) depth at end of fishing (m).
  - (p) Status of the trawl operation (no damage, lightly damaged\*, heavily damaged\*, other (specify)).
- \*Degree may be evaluated by time for repairing ( $\leq 1$  hr or  $> 1$  hr).
- (q) Duration of estimated period of seabed contact (minute)
  - (r) Intended target species.
  - (s) Catch of all species retained on board, split by species, in weight (to the nearest kg).
  - (t) Estimate of the amount (weight or volume) of all living marine resources discarded, split by species.
  - (u) Record of the numbers by species of all marine mammals, seabirds or reptiles caught.

### **C. Catch & Effort Data to be collected for Bottom Gillnet Fishing Activity**

1. Data are to be collected on an un-aggregated (set by set) basis for all observed bottom gillnet sets.
2. The following data are to be collected for each observed bottom gillnet set:
  - (a) Set start date (UTC).
  - (b) Set start time (UTC).
  - (c) Set end date (UTC).
  - (d) Set end time (UTC).
  - (e) Set start position (Lat/Lon, 1 minute resolution).
  - (f) Set end position (Lat/Lon, 1 minute resolution).
  - (g) Net panel ("tan") length (m).
  - (h) Net panel ("tan") height (m).
  - (i) Net mesh size (stretched mesh, mm) and mesh type (diamond, square, etc)
  - (j) Bottom depth at start of setting (m).
  - (k) Bottom depth at end of setting (m).
  - (l) Number of net panels for the set.

- (m) Number of net panels retrieved.
- (n) Number of net panels actually observed during the haul.
- (o) Actually observed catch of all species retained on board, split by species, in weight (to the nearest kg).
- (p) An estimation of the amount (numbers or weight) of marine resources discarded, split by species, during the actual observation.
- (q) Record of the actually observed numbers by species of all marine mammals, seabirds or reptiles caught.
- (r) Intended target species.
- (s) Catch of all species retained on board, split by species, in weight (to the nearest kg).
- (t) Estimate of the amount (weight or volume) of all marine resources discarded\* and dropped off, split by species. \* Including those retained for scientific samples.
- (u) Record of the numbers by species of all marine mammals, seabirds or reptiles caught (including those discarded and dropped-off).

#### **D. Catch & Effort Data to be collected for Bottom Long Line Fishing Activity**

1. Data are to be collected on an un-aggregated (set by set) basis for all observed longline sets.
2. The following fields of data are to be collected for each set:
  - (a) Set start date (UTC).
  - (b) Set start time (UTC).
  - (c) Set end date (UTC).
  - (d) Set end time (UTC).
  - (e) Set start position (Lat/Lon, 1 minute resolution).
  - (f) Set end position (Lat/Lon, 1 minute resolution).
  - (g) Total length of longline set (m).
  - (h) Number of hooks or traps for the set.
  - (i) Bottom (seabed) depth at start of set.
  - (j) Bottom (seabed) depth at end of set.
  - (k) Number of hooks or traps actually observed during the haul.
  - (l) Intended target species.
  - (m) Actually observed catch of all species retained on board, split by species, in weight (to the nearest kg).

- (n) An estimation of the amount (numbers or weight) of marine resources discarded\* or dropped-off, split by species, during the actual observation. \* Including those retained for scientific samples.
- (o) Record of the actually observed numbers by species of all marine mammals, seabirds or reptiles caught (including those discarded and dropped-off).

#### **E. Length-Frequency Data to Be Collected**

1. Representative and randomly distributed length-frequency data (to the nearest mm, with record of the type of length measurement taken) are to be collected for representative samples of the target species and other main by-catch species. Total weight of length-frequency samples should be recorded, and observers may be required to also determine sex of measured fish to generate length-frequency data stratified by sex. The length-frequency data may be used as potential indicators of ecosystem changes (for example, see: Gislason, H. et al. (2000. ICES J Mar Sci 57: 468-475), Yamane et al. (2005. ICES J Mar Sci, 62: 374-379), and Shin, Y-J. et al. (2005. ICES J Mar Sci, 62: 384-396)).
2. The numbers of fish to be measured for each species and distribution of samples across area and month strata should be determined, to ensure that samples are properly representative of species distributions and size ranges.

#### **F. Biological sampling to be conducted (optional for gillnet and long line fisheries)**

1. The following biological data are to be collected for representative samples of the main target species and, time permitting, for other main by-catch species contributing to the catch:
  - (a) Species
  - (b) Length (to the nearest mm), with record of the type of length measurement used.
  - (c) Length and depth in case of North Pacific armorhead.
  - (d) Sex (male, female, indeterminate, not examined)
  - (e) Maturity stage (immature, mature, ripe, ripe-running, spent)
2. Representative stratified samples of otoliths are to be collected from the main target species and, time permitting, from other main by-catch species regularly occurring in catches. All otoliths to be collected are to be labelled with the information listed in 1 above, as well as the date, vessel name, observer name and catch position.



3. Where specific trophic relationship projects are being conducted, observers may be requested to also collect stomach samples from certain species. Any such samples collected are also to be labelled with the information listed in 1 above, as well as the date, vessel name, observer name and catch position.
4. Observers may also be required to collect tissue samples as part of specific genetic research programmes implemented by the SC.
5. Observers are to be briefed and provided with written length-frequency and biological sampling protocols and priorities for the above sampling specific to each observer trip.

#### **G. Data to be collected on Incidental Captures of Protected Species**

1. Flag members operating observer programs are to develop, in cooperation with the SC, lists and identification guides of protected species or species of concern (seabirds, marine mammals or marine reptiles) to be monitored by observers.
2. The following data are to be collected for all protected species caught in fishing operations:
  - (a) Species (identified as far as possible, or accompanied by photographs if identification is difficult).
  - (b) Count of the number caught per tow or set.
  - (c) Life status (vigorous, alive, lethargic, dead) upon release.
  - (d) Whole specimens (where possible) for onshore identification. Where this is not possible, observers may be required to collect sub-samples of identifying parts, as specified in biological sampling protocols.

#### **H. Detection of Fishing in Association with Vulnerable Marine Ecosystems**

1. The SC is to develop a guideline, species list and identification guide for benthic species (e.g. sponges, sea fans, corals) whose presence in a catch will indicate that fishing occurred in association with a vulnerable marine ecosystem (VME). All observers on vessels are to be provided with copies of this guideline, species list and ID guide.
2. For each observed fishing operation, the following data are to be collected for all species caught, which appear on the list of vulnerable benthic species:
  - (a) Species (identified as far as possible or accompanied by a photograph where identification is difficult).

- (b) An estimate of the quantity (weight (kg) or volume (m<sup>3</sup>)) of each listed benthic species caught in the fishing operation.
- (c) An overall estimate of the total quantity (weight (kg) or volume (m<sup>3</sup>)) of all invertebrate benthic species caught in the fishing operation.
- (d) Where possible, and particularly for new or scarce benthic species which do not appear in ID guides, whole samples should be collected and suitable preserved for identification on shore.

## **I. Data to be collected for all Tag Recoveries**

1. The following data are to be collected for all recovered fish, seabird, mammal or reptile tags:
  - (a) Observer name.
  - (b) Vessel name.
  - (c) Vessel call sign.
  - (d) Vessel flag.
  - (e) Collect, label (with all details below) and store the actual tags for later return to the tagging agency.
  - (f) Species from which tag recovered.
  - (g) Tag colour and type (spaghetti, archival).
  - (h) Tag numbers (The tag number is to be provided for all tags when multiple tags were attached to one fish. If only one tag was recorded, a statement is required that specifies whether or not the other tag was missing)
  - (i) Date and time of capture (UTC).
  - (j) Location of capture (Lat/Lon, to the nearest 1 minute)
  - (k) Animal length / size (to the nearest cm) with description of what measurement was taken (such as total length, fork length, etc).
  - (l) Sex (F=female, M=male, I=indeterminate, D=not examined)
  - (m) Whether the tags were found during a period of fishing that was being observed (Y/N)
  - (n) Reward information (e.g. name and address where to send reward)

(It is recognised that some of the data recorded here duplicates data that already exists in the previous categories of information. This is necessary because tag recovery information may be sent separately to other observer data.)

## **J. Hierarchies for Observer Data Collection**

1. Trip-specific or programme-specific observer task priorities may be developed in response to specific research programme requirements, in which case such priorities should be followed by observers.
2. In the absence of trip- or programme-specific priorities, the following generalised priorities should be followed by observers:
  - (a) Fishing Operation Information
    - All vessel and tow / set / effort information.
  - (b) Monitoring of Catches
    - Record time, proportion of catch (e.g. proportion of trawl landing) or effort (e.g. number of hooks), and total numbers of each species caught.
    - Record numbers or proportions of each species retained or discarded.
  - (c) Biological Sampling
    - Length-frequency data for target species.
    - Length-frequency data for main by-catch species.
    - Identification and counts of protected species.
    - Basic biological data (sex, maturity) for target species.
    - Check for presence of tags.
    - Otoliths (and stomach samples, if being collected) for target species.
    - Basic biological data for by-catch species.
    - Biological samples of by-catch species (if being collected)
    - Photos
3. The monitoring of catches and biological sampling procedures should be prioritised among species groups as follows:

<b>Species</b>	<b>Priority (1 highest)</b>
Primary target species (such as North Pacific armorhead and splendid alfonso)	1
Other species typically within top 10 in the fishery (such as mirror dory, and oreos)	2
Protected species	3

All other species	4
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The allocation of observer effort among these activities will depend on the type of operation and setting. The size of sub-samples relative to unobserved quantities (e.g. number of hooks/panels examined for species composition relative to the number of hooks/panels retrieved) should be explicitly recorded under the guidance of member country observer programmes.

## **K. Coding Specifications to be used for Recording Observer Data**

1. Unless otherwise specified for specific data types, observer data are to be collected in accordance with the same coding specifications as specified in this Annex.
2. Coordinated Universal Time (UTC) is to be used to describe times.
3. Degrees and minutes are to be used to describe locations.
4. The following coding schemes are to be used:
  - (a) Species are to be described using the FAO 3 letter species codes or, if species do not have a FAO code, using scientific names.
  - (b) Fishing methods are to be described using the International Standard Classification of Fishing Gear (ISSCFG - 29 July 1980) codes.
  - (c) Types of fishing vessel are to be described using the International Standard Classification of Fishery Vessels (ISSCFV) codes.
5. Metric units of measure are to be used, specifically:
  - (a) Kilograms are to be used to describe catch weight.
  - (b) Metres are to be used to describe height, width, depth, beam or length.
  - (c) Cubic metres are to be used to describe volume.
  - (d) Kilowatts are to be used to describe engine power.

## Implementation of the Adaptive Management for North Pacific armorhead

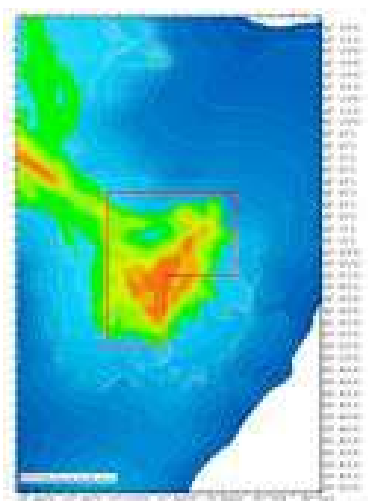
### 1. Monitoring survey for the detection of strong recruitment of North Pacific armorhead

#### (1) Location of monitoring surveys

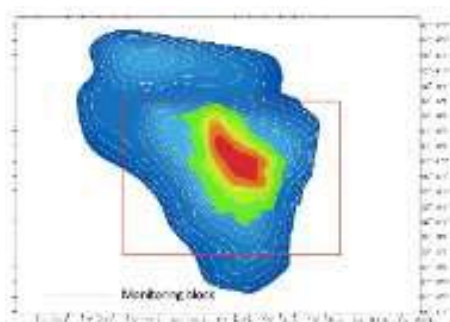
Monitoring surveys for the detection of strong recruitment of North Pacific armorhead will be conducted by trawl fishing vessels in the pre-determined four (24) monitoring blocks of Koko (South eastern), Yuryaku, Kammu (North western) and/or Colahan seamounts.

#### Monitoring blocks

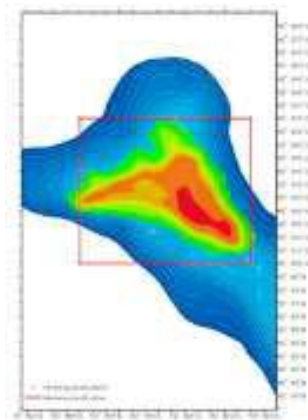
- (1) Koko seamount ( $34^{\circ}51' - 35^{\circ}04'N$ ,  $171^{\circ}49' - 172^{\circ}00' E$ )



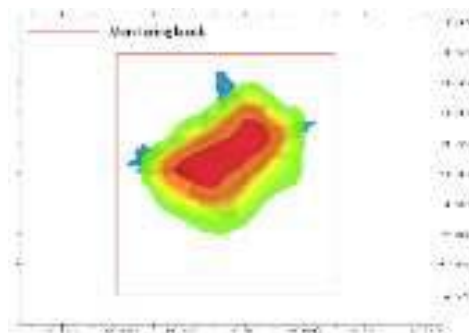
- (2) Yuryaku seamount ( $32^{\circ}35' - 32^{\circ}45'N$ ,  $172^{\circ}10' - 172^{\circ}24'E$ )



(3) Kammu seamount (32°10'–32°21'N, 172°44'–172°57'E)



(4) Colahan seamount (30°57'–31°05'N, 175°50'–175°57'E)



## **(2) Schedule for monitoring surveys**

Monitoring surveys will be conducted from March 1st to June 30th each year, with at least a one week interval between monitoring surveys. For each survey, a trawl fishing vessel will conduct a monitoring survey in one of the four monitoring blocks that is the nearest from the location of the trawl fishing vessel at the time of prior notification in (4) below. The base schedule for monitoring surveys will be notified to the Executive Secretary by the end of February of each year. The base

schedule may be revised during the year subject to prior notification to the Executive Secretary.

### **(3) Data to be collected during monitoring surveys**

For each monitoring survey, a trawl net will be towed for one hour. A scientific observer onboard the trawl fishing vessel will calculate nominal-CPUE (kg/hour) of North Pacific armorhead. The scientific observer will also calculate fat index\* (FI) of randomly sampled 100 individuals of North Pacific armorhead by measuring fork length (FL) and body height (BH) of each individual.

(\*fat index (FI) = body height (BH) / fork length (FL) )

### **(4) Prior notifications and survey results**

At least three (3) days before each survey, a prior notification with monitoring date/time, location and trawl fishing vessel name will be provided by the flag state of the trawl fishing vessel to the Executive Secretary.

No later than three (3) days after each survey, the survey result including date/time, location, catch, nominal-CPUE (kg/hour) and percentage of fish with fat index (FI)>0.3 will be provided by the flag state to the Executive Secretary.

The Executive Secretary will circulate these prior notifications and survey results to all Members of the Commission without delay.

## **1. Areas where bottom fishing with trawl gear is prohibited when high recruitment is detected**

### **(1) Criteria for a high recruitment**

It is considered that high recruitment has occurred if the following criteria are met in four (4) consecutive monitoring surveys.

- Nominal CPUE > 10t/h
- Individuals of fat index (FI)> 0.3 account for 80% or more

## **(2) Areas where bottom fishing with trawl gear is prohibited**

Bottom fishing with trawl gear shall be prohibited in the following two (2) seamount areas (\*) during the year when high recruitment is detected. In such a case, all monitoring surveys scheduled during the year will be cancelled.

- Northern part of Kammu seamount (north of 32°10.0' N)
- Yuryaku seamount

(\*) The catch of North Pacific armorhead in the above two seamounts accounts for a half of the total catch in the entire Emperor Seamounts area based on the catch records in 2010 and 2012.

## **(3) Notification by the Secretariat**

When the criteria for high recruitment are met as defined in 2(1) above, the Executive Secretary will notify all Members of the Commission of the fact with a defined date/time from which bottom fishing with trawl gear is prohibited in the areas as defined in 2(2) above until the end of the year.



## Translation table of VME indicator corals between common and scientific names

VME Indicator Corals from Emperor Seamounts: Present Classification *1, Taxa, and Common (nominal) Names in NPFC								
Sub phylum	Class	Order	Superfamily	Family	Genus/Subgenus	NPFC ~2023	NPFC 2024* #2	Guide Oct. #3
A n t h o z o a	H e x a c o r a l l i a	Antipatharia		Antipathidae	---	Black Corals (Antipatharia)		Black Corals
				Aphanipathidae	---	Black Corals (Antipatharia)		Black Corals
				Cladopathidae	---	Black Corals (Antipatharia)		Black Corals
				Leiopathidae	---	Black Corals (Antipatharia)		Black Corals
				Schizopathidae	---	Black Corals (Antipatharia)		Black Corals
		Scleractinia		Caryophylliidae	---	Stony Corals (Scleractinia)		Hard Corals
				Deltocyathidae	---	Stony Corals (Scleractinia)		Hard Corals
				Dendrophylliidae	---	Stony Corals (Scleractinia)		Hard Corals
				Flabellidae	---	Stony Corals (Scleractinia)		Hard Corals
				Fungiacyathidae	---	Stony Corals (Scleractinia)		Hard Corals
				Micrabaciidae	---	Stony Corals (Scleractinia)		Hard Corals
				Oculinidae	---	Stony Corals (Scleractinia)		Hard Corals
				Turbinoliidae	---	Stony Corals (Scleractinia)		Hard Corals
				Madreporidae	---	Stony Corals (Scleractinia)		Hard Corals
	O c t o c o r a l l i a	Scleractyonacea ≡ Calcaxonina- Pennatulacea	Pennatuloidae *5	Anthoptilidae	---	NA	Pennatulaceans *5	NA
				Balticiniidae	---	NA	Pennatulaceans *5	NA
				Funiculinidae	---	NA	Pennatulaceans *5	NA
				Kophobelemnidae	---	NA	Pennatulaceans *5	NA
				Pennatulidae	---	NA	Pennatulaceans *5	NA
				Protoptilidae	---	NA	Pennatulaceans *5	NA
				Scleroptilidae	---	NA	Pennatulaceans *5	NA
				Stachyptilidae	---	NA	Pennatulaceans *5	NA
				Umbellulidae	---	NA	Pennatulaceans *5	NA
				Veretillidae	---	NA	Pennatulaceans *5	NA
				Virgulariidae	---	NA	Pennatulaceans *5	NA
				Chrysogorgiidae	---	Gorgonacea	Gorgonians	Gorgonians
				Keratoisididae	---	Gorgonacea	Gorgonians	Gorgonians
				Primnoidae	---	Gorgonacea	Gorgonians	Gorgonians
				<b>Briareidae</b>	---	Gorgonacea	Gorgonians	Gorgonians
				Clavulariidae>> <b>Briareidae</b>	<i>Pachyclavularia</i> >> <b>Briareum</b>	Alcyonacea	Soft Corals	Soft Corals
				Alcyoniidae>> <b>Coralliidae</b> *6	<i>Anthomastus</i> <i>Paraminabea</i>	Alcyonacea	Soft Corals	Soft Corals
				Paragorgiidae>> <b>Coralliidae</b> *6	---	Alcyonacea	Soft Corals	Soft Corals
				<b>Coralliidae</b> *6	---	Gorgonacea	Gorgonians	Gorgonians
		M a l a c a l c y o n a c e a  *4		Clavulariidae	---	Alcyonacea	Soft Corals	Soft Corals
				---	<i>Pseudocladochonus</i> *7	Alcyonacea	Soft Corals	Soft Corals
				Tubiporidae	---	Alcyonacea	Soft Corals	Soft Corals
				Nidaliidae	---	Alcyonacea	Soft Corals	Soft Corals
				Siphonogorgiidae	---	Alcyonacea	Soft Corals	Soft Corals
				Anthothelidae>> <b>Alcyoniidae</b> *8	<i>Anthothela</i>	Gorgonacea	Gorgonians	Gorgonians
				Nephtheidae>> <b>Alcyoniidae</b> *8	<i>Gersemia</i>	Alcyonacea	Soft Corals	Soft Corals
				<b>Alcyoniidae</b> *8	---	Alcyonacea	Soft Corals	Soft Corals
				Nephtheidae	---	Alcyonacea	Soft Corals	Soft Corals
				Paralcyoniidae	---	Alcyonacea	Soft Corals	Soft Corals
				Gorgoniidae	---	Gorgonacea	Gorgonians	Gorgonians
				Isididae	---	Gorgonacea	Gorgonians	Gorgonians
				Keroeidae	---	Gorgonacea	Gorgonians	Gorgonians
				Astrogorgiidae	---	Gorgonacea	Gorgonians	Gorgonians
				Euplexauridae	---	Gorgonacea	Gorgonians	Gorgonians
				Anthogorgiidae	---	Gorgonacea	Gorgonians	Gorgonians
				Acanthogorgiidae	---	Gorgonacea	Gorgonians	Gorgonians
				Victorgorgiidae	---	Gorgonacea	Gorgonians	NA
				Plexauridae	---	Gorgonacea	Gorgonians	NA
				---	<i>Calcigorgia</i> *9	Gorgonacea	Gorgonians	NA

\*1 Classification is based on WoRMS (in July 2024)

\*2 Nominal names of VME indicator corals agreed by NPFC for adoption after 2025 (NPFC-2024-COM8-Final Report-ANNEX O-G)

\*3 Coral Morphology Categories of "NPFC VME Taxa Identification Guide (Western North Pacific Ocean)"

\*4 See WoRMS based on McFadden *et al.* (2022) for the present octocorallian classification, and McFadden *in* Daly *et al.* (2007) for the former one. The current families of octocorals and their correspondence to former suborders/systems are well summarized *in* Table 2 of McFadden *et al.* (2022)

\*5 2024 9th COM has agreed to add pennatulaceans (sea pens) to the VME indicator taxa (entered into force 1 January 2025)

\*6 The family Coralliidae is originally gorgonians (Gorgonacea), but the current classification includes some soft corals (formerly Alcyonacea) (e.g. *Anthomastus*)

\*7 *Pseudocladochonus* is the genus *Octocorallia incertae sedis* in McFadden *et al.* (2022) and in also WoRMS. (See Table 3 *in* McFadden *et al.*, 2022)

\*8 The family Alcyoniidae is originally soft corals (former Alcyonacea), but the current classification includes some gorgonians (Gorgonacea) (e.g. *Anthothela*)

\*9 *Calcigorgia* is a gorgonian genus *in* *Octocorallia incertae sedis* in McFadden *et al.* (2022) and in also WoRMS. (See Table 3 *in* McFadden *et al.*, 2022)

>> pink= former Gorgonacea (Gorgonians); yellow= former Alcyonacea (Soft Corals)

WoRMS (World Register of Marine Species) <https://www.marinespecies.org/index.php>

Daly *et al.* (2007) The phylum Cnidaria: A review of phylogenetic patterns and diversity 300 years after Linnaeus. *Zootaxa*, 1668: 127-182.

McFadden *et al.* (2022) Revisionary systematics of Octocorallia (Cnidaria: Anthozoa) guided by phylogenomics. *Bull. Soc. Syst. Biol.*, 1: 1-79.

**Request from the TCC Chair on the development of an ROP and responses from SC**

The TCC Chair, Ms. Alisha Falberg, requested to answer the following questions so that TCC can consider SC's answers in their development of a regional observer program (ROP):

1. Are there different needs for the different fisheries regarding data collection?
2. What new data would the SC prioritize/need from a ROP?
3. What new data would be nice to have (i.e. not needed/priority)?
4. Whether this data could be collected through electronic monitoring (EM)?
5. Whether the observer needs to be a scientist, or can data be collected by a non-scientist?

**SSC PS****1. Are there different needs for the different fisheries regarding data collection?**

*There would be no needs for data collection through the fisheries different from the stick-held dipnet fisheries which are dominant in Pacific saury fishing.*

**2. What new data would the SC prioritize/need from a ROP?**

*Towards introduction of age-structured model, collection of size data is essential. Although, in that sense, ROP may facilitate it, current schemes to collect size data applied in each Member, such as port size sampling and at-sea onboard sampling by fishermen can secure collection of precise size data.*

**3. What new data would be nice to have (i.e. not needed/priority)?**

*Data on environmental conditions, such as temperature, would be beneficial but not a top priority.*

**4. Whether this data could be collected through electronic monitoring (EM)?**

*EM can collect those data (environmental information mentioned in 3). In general, cameras are used as possible devices in EM. Feasibility of camera observer should be investigated in collection of information on species identification and size of catches in the small pelagics-targeting fisheries such as purse seiners and trawlers which can capture multiple fish species concurrently.*

**5. Whether the observer needs to be a scientist, or can data be collected by a non-scientist?**

*Referring to ROP in tuna RFMOs, on-board observers are not always performed by scientists. Nevertheless, the non-scientist observers should be trained regarding species identification and procedure of size measurement.*

**SSC NFS****1. Are there different needs for the different fisheries regarding data collection?**

*Yes, different fisheries have specific data requirements based on their unique ecological, fishery operational characteristics, and stock assessment approach. That being said, there are definitely common data needs across different fisheries.*

**2. What new data would the SC prioritize/need from a ROP?**

*High-priority data includes catch composition, catch, and effort data for NFS. In particular, it is important to collect age and size composition data for more accurately separating the two cohorts of NFS. Size data can be collected by onboard observers or by port sampling. Such data could potentially be collected by electronic monitoring, but further study and technical work is needed to confirm whether this would indeed be possible.*

**3. What new data would be nice to have (i.e. not needed/priority)?**

*Data on environmental conditions, such as temperature, would be beneficial but not a top priority.*

**4. Whether this data could be collected through EM?**

*Size data can be collected by onboard observers or by port sampling. Such data could potentially be collected by electronic monitoring, but further study and technical work is needed to confirm whether this would indeed be possible.*

*Environmental data can easily be collected through EM. Biological data (catch composition, catch, and effort data) can be collected for NFS if devised wisely. Having worked on an NFS jigging vessel for several months (as a graduate student), I am familiar with their catch processing. The squid are sorted by size and packaged, and all squid are moved to the cooler via a conveyor. If a device is installed above the conveyor, it could potentially count the number of packaged bags by size and estimate total catch and size composition. Developing such a device could be a potential research project and may be worth pursuing as it would be less costly and could potentially provide more accurate and comprehensive data.*

**5. Whether the observer needs to be a scientist, or can data be collected by a non-scientist?**

*An observer collecting size composition data would not necessarily need to be a scientist but would need to be able to distinguish between different squid species, which could be achieved with the appropriate training and could possibly be further supported by the development of a species identification guidebook by the SSC NFS.*

## **TWG CMSA**

**1. Are there different needs for the different fisheries regarding data collection?**

- *There is no need, because TWG CMSA can gather important catch information from the dominant fisheries by Member.*

**2. What new data would the SC prioritize/need from a ROP?**

- *Detailed information on fishing effort and catch, such as*
  - *searching time of school of targeted fish species, and*
  - *target by operation (set)*

- *number of operation (set)*
- *more accurate information about catch by species (blue mackerel and chub mackerel)*
- *biological information on the catch*
- *Information on development of easy-to-use species identification of mackerel species on board by fishermen*

**3. What new data would be nice to have (i.e. not needed/priority)?**

- *Data on environmental conditions, such as temperature, would be beneficial but not a top priority.*

**4. Whether this data could be collected through electronic monitoring (EM)?**

- *EM is expected to collect this information.*
- *The feasibility of EM should be discussed and recognized by the Members. Furthermore, because understanding of the fisherman is needed for introduction of EM, intensive outreach should be done.*
- 

**5. Whether the observer needs to be a scientist, or can data be collected by a non-scientist?**

- *Although the observers are not necessary scientists, they need to be trained by scientists to meet requirements.*

**SSC BF-ME**

**1. Are there different needs for the different fisheries regarding data collection?**

- *Yes. Please refer to the NPFC Bottom Fisheries Observer Programme Standards (Annex 5, CMMs 2024-05 and 2024-06).*

**2. What new data would the SC prioritize/need from a ROP?**

- *All data needs are currently being met with the NPFC Bottom Fisheries Observer Programme Standards (Annex 5, CMMs 2024-05 and 2024-06)*

**3. What new data would be nice to have (i.e. not needed/priority)?**

- *None from an observer program.*

**4. Whether this data could be collected through electronic monitoring (EM)?**

- *Yes for sablefish, but not for NPA, SA*
- *It is unclear if other important data can be collected with EM*
- *This depends on the gear type: EM could work for longlines, but could be difficult for trawlers without effective technologies*
- *Some biological data can only be (or is best) collected by humans*

**5. Whether the observer needs to be a scientist, or can data be collected by a non-scientist?**

- *Observers do not need to be scientists, but they need to be well-trained to collect the data needed correctly*