North Pacific Fisheries Commission

NPFC-2017-SC02-Final Report

2nd Scientific Committee Meeting
REPORT

24-27 April 2017

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2nd Floor Hakuyo Hall,
Tokyo University of Marine Science and Technology,
4-5-7 Konan, Minato-ku, Tokyo
108-8477, JAPAN

TEL +81-3-5479-8717
FAX +81-3-5479-8718
Email secretariat@npfc.int

North Pacific Fisheries Commission
2nd Meeting of the Scientific Committee

24-27 April 2017
Shanghai, China

REPORT

Agenda Item 1. Opening of Meeting

1. The 2nd Meeting of the Scientific Committee (SC) took place in Shanghai, China on 24-27 April 2017, and was attended by Members from Canada, China, Japan, the Republic of Korea, the Russian Federation, and Chinese Taipei, and the United States of America had an advisor present. Vanuatu, the Food and Agriculture Organization of the United Nations (FAO), the North Pacific Anadromous Fish Commission (NPAFC), and the North Pacific Marine Science Organization (PICES) attended as observers. The meeting was opened by Dr. Joji Morishita (Japan) who served as the SC Chair.

2. Mr. Xinzhong Liu, Deputy Director-General of the Bureau of Fisheries, Ministry of Agriculture, offered opening remarks on behalf of the host Member. Mr. Liu welcomed the participants to Shanghai and expressed China's great honor to host the NPFC SC meeting. Mr. Liu explained China's efforts to enhance the conservation of marine resources in the North Pacific Ocean. In addition, Mr. Liu stated that scientific assessment was essential for the management and conservation of marine resources in the North Pacific Ocean, and explained that China attached great importance to and made great contribution to their long-term sustainable use. Finally, Mr. Liu congratulated the NPFC on its scientific achievements to date, including completion of its first stock assessment of Pacific saury, and expressed China's commitment and cooperation for the NPFC's future activities.

3. Prof. Jiamin Wu, Communist Party of China Secretary of Shanghai Ocean University, also offered welcome remarks on behalf of the host Member. Prof. Wu explained Shanghai Ocean University's history of contributing to fisheries research in China and internationally, and expressed his honor to contribute to the hosting of the SC meeting. Finally, Prof. Wu expressed his hope for the success of the meeting, and for constructive and fruitful discussions.

4. Vanuatu notified that it had prepared the instruments for ratification of the Convention and

submitted the signed documents to the Embassy of the Republic of Korea, and that it looked forward to becoming a Member of the NPFC in the near future.

Agenda Item 2. Adoption of Agenda

5. The SC agreed to discuss Russia's request to conduct an exploratory fishery targeting deep water crab, as well as the structure of the SC, under Agenda Item 10. Other Matters.

6. The SC agreed to add the following sub-items under Agenda Item 9. Cooperation with Other Organizations: a presentation by the FAO with an update on the Areas Beyond National Jurisdiction (ABNJ) Deep Seas Project, a presentation by the NPAFC on its multinational survey in the North Pacific Ocean, and a presentation by PICES.

7. The Secretariat proposed presenting an update on the Biological Diversity Beyond Areas of National Jurisdiction (BBNJ) exercise after the report of the SSC on North Pacific Armorhead (Agenda Item 4.2).

8. The SC agreed to shift Agenda Item 7.2 Observer Program to Agenda Item 6.3

9. The SC agreed to revise the subject of Agenda Item 6.4 (previously Agenda Item 6.3 prior to the revision in the above paragraph) from "Data management policy (Japan)" to "Data management policy."

10. The revised agenda was adopted (Annex A).

Agenda Item 3. Meeting Arrangements

11. The Science Manager Dr. Aleksandr Zavolokin outlined the meeting schedule and Mr. Alexander Meyer was selected as Rapporteur. Document List (Annex B) and Participants List (Annex C) are attached to the report.

Agenda Item 4. Review of Recommendations from the Small Scientific Committees (SSCs) and Chub Mackerel Workshop

4.1 SSC on Vulnerable Marine Ecosystems

12. The Chair of the SSC on Vulnerable Marine Ecosystems (SSC VME), Dr. Loh-Lee Low, summarized the outcomes and recommendations of the 2nd SSC VME meeting (SSC VME02-Final Report).

13. Canada explained that it was also conducting research on VMEs and hoped to publish this

research in the near future.

14. Japan raised the issue of procedures for considering additional management measures such as spatial closure for potential VME risk sites. There will be further consideration of this issue following the 2018 VME workshop (Annex F, #1).

15. Korea explained that it was formulating a field VME identification guide and proposed that the Members conduct intersessional work to strive to complete the aforementioned guide in advance of the next SSC VME meeting. The SC agreed to discuss the proposal under Agenda Item 7. Scientific Projects for 2017 and 2018.

16. The FAO clarified that it wished to support the activities of the SSC VME by supporting a workshop, linked to the ABNJ project, whose nature and format are to be determined by the SC.

17. Regarding the holding of the VME workshop, Korea expressed the view that more fine-scale data may be necessary for the workshop.

18. The SC endorses the following recommendations based on the SSC VME02 report and recommends the shaded items to the Commission:
    a. VME taxa – no change, but continue research on inclusion of other VME indicators in future and produce a common NPFC VME field guide.
    b. Encounter threshold – no change, but continue research toward identifying more scientifically-valid thresholds.
    c. Move-on rule – no change.
    d. Reporting requirements – no change.
    e. CMM for the Northwestern Pacific Ocean – no change, as adopted by the 2nd Commission meeting (Paragraph 22c.).
    f. CMM for the Northeastern Pacific Ocean – endorse revised CMM 2016-06 as proposed by Canada.
    g. Exploratory Fishery Protocol in the North Pacific Ocean – refer to SC for consideration of more detailed technical guidance.
    h. SAI assessment – propose a workshop to further assess SAI (2017-2018).
    i. VME data collection standards – no change, but hold a workshop for further discussions.
    j. Data sharing – refer to SC for development of data sharing policy.
    k. Spatial management of bottom fisheries and VMEs – Discuss establishing GIS database.

19. Regarding the recommendation under paragraph 18 item f. above, the SC proposed an additional editorial change to CMM 2016-06 in relation to the information to be used for determining the level of a historical average for fishing effort (Annex D).

20. Regarding the recommendations made by the SSC VME requesting further consideration/discussion by the SC, the SC recommends the following:
    a. CMM for the Northeastern Pacific Ocean – endorse revised CMM 2016-06 as proposed by Canada with correction made by SC (Annex D).
    b. Exploratory Fishery Protocol in the North Pacific Ocean – Develop terms of reference for the technical guidelines for the Exploratory Fishery Protocol at the next SSC VME meeting (Paragraph 72).
    c. SAI assessment and VME data collection standards – Hold a joint VME workshop with support from the FAO's ABNJ project, addressing both VME data and SAI assessment, in March 2018 in Japan, co-chaired by Dr. Masashi Kiyota and Dr. Loh-Lee Low.
    d. Data sharing – That the SC discuss this further under Agenda Item 6. Progress in Data Collection, Management and Security.
    e. Spatial management of bottom fisheries and VMEs – That the SC consider the provision of seed money for initial efforts towards developing a GIS database (Annex F, #3).

4.2 SSC on North Pacific Armorhead

21. The Chair of the SSC on North Pacific Armorhead (SSC NPA), Dr. Taro Ichii, summarized the outcomes and recommendations of the 2nd SSC NPA meeting (SSC NPA02-Final Report).

22. The SC endorses the following recommendations based on the SSC NPA02 report and recommends the shaded items to the Commission:
    a. Broaden the scope of the SSC NPA to encompass bottom fish stocks in the Convention Area, not only NPA.
    b. Conduct intersessional work to develop templates for data collection and reporting by observers and fishers through a Corresponding Group nominated at the SC meeting.
    c. Endorse the revised CMM 2016-05 (Annex E), which now includes more precise geographical information.
    d. No further revision related to NPA is currently needed for CMMs 2016-05 and 2016-06. However, in light of the low levels of NPA catch, additional measures for the NPA stock may be needed in the future.
    e. Include the suggestions for the 5-year Research Plan (Annex G).
    f. Discuss establishing a GIS database for the spatial management of bottom fisheries and VMEs.

g. Consider the adoption of an Adaptive Management process (plan, act, monitor, evaluate) for NPA through the collaboration of scientists, managers, and fishers.

23. Regarding the recommendation under paragraph 22. item b. above, the SC agreed to hold further discussions under Agenda Item 6. Progress in Data Collection, Management and Security.

24. Regarding the recommendations under paragraph 22. items d. and g. above, the SC requested that Japan prepare more specific plans and management objectives, with the cooperation of other Members.

25. Regarding the recommendation under paragraph 22. item f. above, the SC agreed to consider the provision of seed money for initial efforts towards developing a GIS database (Annex F, #3), as noted in paragraph 20e.

26. The NPFC Compliance Manager provided an update on the BBNJ exercise. The SC reaffirmed the importance of taking actions for the conservation and management of fisheries resources and marine ecosystems in the North Pacific Ocean.

4.3 SSC on Pacific Saury

27. The Chair of the SSC on Pacific Saury (SSC PS), Dr. Toshihide Iwasaki, summarized the outcomes and recommendations of the 2nd SSC PS meeting (SSC PS02-Final Report).

28. The SC endorses the following recommendations based on the SSC PS02 report and recommends the shaded items to the Commission:
    a. Maintain CMM 15-02 in its current form and do not expand fishing efforts in 2018.
    b. Collect more data on the impact of IUU fishing, bycatch, and catch discarding on Pacific saury stock in the North Pacific Ocean.
    c. Conduct further research to better understand the Pacific saury spatial/temporal dynamics in the North Pacific Ocean.
    d. Modify the proposed data collection templates as necessary to meet the requirements for stock assessment and management.
    e. Continue to update stock assessments with the provisional base production model.
    f. Conduct further research on ways to improve the provisional base model, towards conducting benchmark stock assessments.
    g. Continue the work of the TWG PSSA and endorse the terms of reference for the TWG PSSA for 2017-2021 (Annex H).

h. Endorse the new Chair of the TWG PSSA, Dr. Toshihide Kitakado, and identify the place and time of the next meeting.
i. Independently peer review the Pacific saury stock assessment at a time and in a format that are to be determined at a future SSC PS meeting.
j. Include the suggestions for the areas of work and the 5-year work plan (Annex F of the SC PS02 report) in the Research Plan.
k. Consider budget for meeting costs of TWG PSSA and travel cost for 1 or 2 participants from each Member. Rough costs were estimated at 20,000 USD per year to be further adjusted by FAC for further consideration by the Commission (Annex F, #4).

29. In addition to the recommendations in paragraph 28 above, the SC recommends the following:
    a. Regarding management measures for Pacific saury, maintain CMM 15-02 in its current form and do not expand fishing efforts in 2018, or develop a new management measure based on the stock status and MSY mentioned in the SC and SSC reports, with a consideration of the uncertainties.
    b. Continue to evaluate the quality of Japan's scientific survey data used in the stock assessment to reduce uncertainties associated with the stock assessment.

30. Regarding paragraph 28. item d. above, the SC agreed to hold further discussion under Agenda Item 6. Progress in Data Collection, Management and Security.

31. Regarding paragraph 28. item g. above, the SC endorsed the Terms of Reference in principle, but added the evaluation of the quality of the indices as a task under paragraph 2 and a minor editorial change to paragraph 8 of the Terms of Reference (Annex H).

32. Regarding paragraph 28. item i. above, the SC agreed to hold further discussion under Agenda Item 7. Scientific Projects for 2017 and 2018.

33. Regarding paragraph 28. item j. above, the SC endorsed the suggestions in principle, but added the evaluation of the quality of the data for the stock assessment as a task for 2018 (Annex G).

34. Regarding paragraph 28. item k. above, the SC agreed to further specify the proposal as covering travel costs for 2 participants.

4.4 Chub mackerel workshop

35. The Chair of the Chub mackerel workshop (WS CM), Dr. Hiromu Zenitani, summarized the outcome of the ad-hoc WS CM meeting (WS CM01-Final Report).

36. The SC reviewed the recommendations in the WS CM01 report and recommends the following:
    a. Establish a Technical Working Group on Chub Mackerel (TWG CM) for the purpose of stock assessment with a draft work plan and terms of reference to be determined.
    b. The terms of reference *inter alia* could include the following items: data quantity, data quality, sources of uncertainty.
    c. The SC was unable to evaluate precautionary approaches for the management of chub mackerel fisheries as CMM 2016-07 only came into effect in January 2017.

37. Japan stated that it intends to prepare a draft work plan for stock assessment, including a draft list of data.

38. China stated that such a draft work plan for stock assessment should be developed by the TWG on chub mackerel.

Agenda Item 5. Progress and Update on Stock Assessment

5.1 Bottom fish

39. In addition to the consideration of the SSC NPA report above, the SC discussed the following progress in the development of stock assessments for bottom fish:
    a. The SC recognized that the fishing of splendid alfonsino is occurring and encouraged Members engaged in such fishing to conduct a stock assessment of splendid alfonsino.
    b. The SC recognized the comprehensive work done by the FAO to conduct a global review of alfonsino (NPFC-2017-SC02-IP02).
    c. The SC recognized that the stock assessment framework for the NPA is developed based on its unique biology.

5.2 Pelagic fish and squids

40. The SC recognized the existence of priority species of the NPFC other than those for which the SC is currently conducting stock assessments. The SC agreed to continue to collect data and monitor the situations related to such species.

Agenda Item 6. Progress in Data Collection, Management and Security

6.1 Data reporting templates (Korea)

41. Korea presented its progress in developing standardized reporting templates as well as the progress of the corresponding group on Pacific saury data collection templates.

42. In order to complete the Pacific saury data collection template within the specific timeline in

Annex G, the SC encouraged the Member in disagreement with other Members to actively cooperate with Korea to reach a consensus.

43. The SC agreed to establish a corresponding group for developing data reporting templates for bottom fisheries and also reaffirm the existent corresponding group for pelagic fisheries (Annex I). The SC encouraged Members to provide their data collection elements from each fishery to Korea for an efficient process to develop the data templates.

6.2. Transshipment data (CMM 2016-03)

44. The SC discussed data fields to be included in the transshipment summary provided by Members to the Secretariat, referring to NPFC-2017-SC02-IP04. Russia proposed the inclusion of IMO number in the summary.

45. The SC recognized the usefulness of transshipment data for stock assessment activities, mainly for the purpose of validating data. At this stage, other than the requirements described in Information Paper NPFC-2017-SC02-IP04, the SC does not have any additional requirements for the data currently being reported by Members. The SC also recognized that the collection of transshipment data was mainly an issue for the Technical & Compliance Committee (TCC) and the Commission, and that both have expressed interest in the matter. The SC therefore requests that the TCC and the Commission keep the SC informed of discussions and developments related to transshipment data, so that the SC can use the collected data for stock assessment activities.

6.3 Observer Program

46. The SC discussed plans to develop the North Pacific Ocean Fisheries Observer Program.

47. The SC recognized the necessity of the North Pacific Ocean Fisheries Observer Program and agreed to establish a corresponding group, headed by the Science Manager, for advancing work towards the development of such an Observer Program. The corresponding group will compile information regarding the existing observer programs of Members and those of other regional fisheries management organizations, to establish a basis for holding further discussions on developing the Observer Program.

48. The SC also recognized the importance of developing a standardized protocol and data collection templates, as well as training and outreach programs, for ensuring the same standard of data collection by all observers.

49. China, supported by some Members, suggested that Members provide technical reports on their existing Observer Programs in the Convention Area of NPFC to the SC for review and evaluation.

50. Japan stated that the Observer Program is one of many tools to collect information necessary to scientific work and dockside sampling is the main tool of collecting such information for pelagic fish in Japan.

6.4 Data management policy

51. The Science Manager presented a draft Information Security Guidelines including four categories of information in relation to risk of its disclosure, types of information, proposed regulations for each type, protection of data ownership and other issues related to data and publication handling by the NPFC (NPFC-2017-SC02-WP03 and NPFC-2017-SC02-IP01).

52. The SC recommends the establishment of a corresponding group that will work intersessionally with the TCC to further develop the draft Information Security Guidelines, based on NPFC-2017-SC02-WP03. The corresponding group will be jointly headed by the Science Manager and the Compliance Manager. The SC suggests that the corresponding group review this document and come to a consensus by the Commission meeting in July 2017.

6.5 NPFC data management system (Secretariat)

53. The IT consultant, Dr. Raymond Wu, presented on the project strategy and architecture of the NPFC data management system, including the business context, the system context, the architecture design, and the future roadmap (NPFC-2017-SC02-WP04 (Rev1)).

54. The SC discussed the proposed plans to establish a GIS database and asked to include spatial extensions into the benchmark process for the NPFC data management system. The IT consultant explained that this was feasible, but that further input from Members regarding specifications was required.

55. The SC discussed the desirability of connecting the NPFC data management system to other oceanographic databases with open data. The IT consultant explained that this was feasible.

56. In further elaborating this issue, Members are requested to direct any further inquiries regarding the NPFC data management system to the Secretariat.

Agenda Item 7. Scientific Projects for 2017 and 2018

7.1 Stock assessments

7.2 Other projects

57. The Science Manager presented the compiled document on scientific projects for 2017 and 2018 that were discussed above and approved by the SC, as well as suggestions submitted to the Secretariat (NPFC-2017-SC02-WP06) regarding a Chub mackerel meeting and consultant for Chub mackerel stock assessment.

58. The SC reviewed the proposed scientific projects for 2017 and 2018 and endorses the revised proposal for consideration by the Commission (Annex F).

59. The SC requests that the Finance and Administration Committee establish a common procedure for the submission, evaluation, and approval of proposals for scientific projects for further consideration by the Commission, as well as establishment of a Special Project Fund filled with unspent scientific funds and other sources.

Agenda Item 8. 2017-2021 Research Plan

60. The SC Chair presented the revised Research Plan (NPFC-2017-SC02-WP01 (Rev. 1)).

61. The SC reviewed and endorses the revised Research Plan (Annex G).

Agenda Item 9. Cooperation with Other Organizations

62. The FAO presented an update on the ABNJ Deep Seas Project, including progress in 2016 and upcoming project activities.

63. The NPAFC reported on the multinational survey it plans to conduct in the North Pacific Ocean in winter 2019 as part of the International Year of the Salmon (IYS) project and invited the NPFC to participate in, and contribute to the IYS project.

64. The SC highly recommended NPFC to take advantage of the multinational survey being conducted by the NPAFC, and to formulate a plan for a cooperative survey.

65. PICES presented an update on its activities and proposals for cooperation between PICES and the NPFC. PICES explained its interest in the effects of climate change/climate variation in the abundance and distribution of stocks in the North Pacific Ocean, and invited the NPFC to mutually cooperate in any of the existing PICES or NPFC projects. In particular, PICES invited the NPFC to serve as a co-sponsor or supporting organization for the 4th International Symposium on the Effect of Climate Change on the World's Oceans to be held in Washington

DC, USA on June 4-8, 2018.

66. The Science Manager reported on his attendance as NPFC representative at the International Symposium on Drivers of Dynamics of Small Pelagic Fish Resources organized by PICES and ICES on March 6-11, 2017, including potentially useful research and output, and major outcomes of interest to the NPFC (NPFC-2017-SC02-IP03). The Science Manager requested the guidance of the SC on potential areas for cooperation between NPFC and PICES to be discussed at the PICES Annual meeting in September 2017.

67. Members agreed to enhance cooperation with PICES as an intergovernmental scientific organization with similar membership, convention area and scientific interests to NPFC and encourage PICES to participate in the NPFC meetings.

68. The SC recommends to establish a joint NPFC-PICES group (Annex I) to identify potential areas of cooperation and work intersessionally to develop the terms of reference for the working group for consideration by the Commission in July 2017.

69. The SC recommends that Members engage in more proactive cooperation with other organizations.

Agenda Item 10. Other Matters

Selection of next Chair and Vice Chair

70. The SC agreed to extend the term of the current Chair, Dr. Joji Morishita, and the current Vice Chair, Dr. Janelle Curtis for a further two years each.

Information on Exploratory fishery targeting deep water crab

71. The SC discussed Russia's request to conduct an exploratory fishery targeting deep water crab, referring to NPFC-2017-SC02-WP02. Some Members expressed the view that Russia's request did not constitute an exploratory fishery as defined under Annex 1 of CMM 2016-05. However, the SC recognized that Russia's request involved the resumption of an existing fishery after several years (CMM 2016-05, Annex 2, Paragraph 5 (7)), and, as the SC is interested in the data from the aforementioned fishery, it requested that Russia collect extensive data in the course of conducting the fishery, assess SAI in accordance with CMM 2016-05 and submit this assessment to future SC meetings. The SC will review the reported assessment and determine whether or not the fishery is having an SAI on VMEs.

72. The SC also recognized that there may be a need to improve the Exploratory Fishery Protocol

and forwarded the draft terms of reference for the development of technical guidelines for improvement of the current Exploratory Fishery Protocol (Annex J) for the consideration of the relevant SSCs.

Structure of SC

73. Based on the discussion above, the SC has updated its structure, broadening the scope of SSC NPA to SSC on Bottom Fish and establishing the TWG on Chub mackerel (Annex K).

MCS related issues from SC to TCC

74. Based on the discussion above, the SC identifies the following matters as MCS related issues for consideration by TCC:
    a. Maintain CMM 15-02 or develop a new CMM based on the stock assessment.
    b. No revisions to CMM 2016-03 regarding transshipment data.
    c. Endorse the revised CMM 2016-05 (Annex E).
    d. Endorse the revised CMM 2016-06 (Annex D).
    e. Nominate participants for the SC/TCC corresponding group on the NPFC Information Security Guidelines to work intersessionally prior to the TCC meeting in 2017.

Agenda Item 11. Advice and Recommendations to the Commission

75. The shaded paragraphs in this report constitute the recommendations by the SC to the Commission.

Agenda Item 12. Next Meeting

76. The SC recommends holding the next TWG PSSA meeting in Vladivostok on 6-8 December 2017.

77. The SC recommends holding the first TWG CM meeting in Vladivostok on 4-5 December 2017, prior to the TWG PSSA.

78. The SC recommends holding the VME workshop in Japan in March 2018.

79. The SC recommends holding the next SC and SSC meetings at a similar timing in 2018. The date and location will be notified by the Secretariat via correspondence.

80. A compilation of all meetings is annexed to this report (Annex L).

Agenda Item 13. Adoption of the Report

81. The report was adopted by consensus.

Agenda Item 14. Close of the Meeting

82. The SC meeting closed at 13:54 on 27 April 2017.

Annexes

Annex A – Agenda

Annex B – List of Documents

Annex C – Participants List

Annex D – Revision for CMM 2016-06

Annex E – Revision for CMM2016-05

Annex F – Scientific Projects proposed by the Scientific Committee

Annex G – 2017-2021 Research Plan

Annex H – Terms of Reference for the Technical Working Group on Pacific Saury Stock Assessment

Annex I – Focal points for Scientific Committee and its subsidiary bodies

Annex J – Draft TORs of SSC-VME and SSC-Bottom Fish for the development of technical guidelines that supplement exploratory fishery protocols

Annex K – North Pacific Fisheries Commission structure for 2017 including proposed revision by the Scientific Committee

Annex L – NPFC Meetings 2017–2018

Annex A

North Pacific Fisheries Commission
2nd Scientific Committee Meeting
24-27 April 2017
Shanghai, China

Agenda

Agenda Item 1. Opening of the meeting

Agenda Item 2. Adoption of Agenda

Agenda Item 3. Meeting arrangements

Agenda Item 4. Review of recommendations from the Small Scientific Committees (SSCs) and Chub mackerel workshop
- 4.1 SSC on Vulnerable Marine Ecosystems
- 4.2 SSC on North Pacific Armorhead
- 4.3 SSC on Pacific Saury
- 4.4 Chub mackerel workshop

Agenda Item 5. Progress and update on stock assessment
- 5.1 Bottom fish
- 5.2 Pelagic fish and squids

Agenda Item 6. Progress in data collection, management and security
- 6.1 Data reporting templates (Korea)
- 6.2. Transshipment data (CMM 2016-03)
- 6.3 Observer Program
- 6.4 Data management policy
- 6.5 NPFC data management system (Secretariat)

Agenda Item 7. Scientific projects for 2017 and 2018
- 7.1 Stock assessments
- 7.2 Other projects

Agenda Item 8. 2017-2021 Research Plan

Agenda Item 9. Cooperation with other organizations

- ABNJ Deep Seas project, FAO
- NPAFC
- PICES

Agenda Item 10. Other matters

- Selection of next Chair and Vice Chair
- Information on Exploratory fishery targeting deep water crab (Russia)
- Structure of SC
- MCS related issues from SC to TCC

Agenda Item 11. Advice and recommendations to the Commission

Agenda Item 12. Next meeting

Agenda Item 13. Adoption of the Report

Agenda Item 14. Close of the Meeting

Annex B

LIST OF DOCUMENTS

MEETING INFORMATION PAPERS

Symbol	Title
NPFC-2017-SC02-MIP01	Meeting Notice and Information
NPFC-2017-SC02-MIP02	Provisional Agenda
NPFC-2017-SC02-MIP03	Provisional Annotated Agenda
NPFC-2017-SC02-MIP04 (Rev. 2)	Indicative Schedule
NPFC-2017-SC02-MIP05 (Rev. 2)	Provisional List of Documents

REFERENCE DOCUMENTS

Symbol	Title
	Convention on the Conservation and Management of High Seas Fisheries Resources in the North Pacific Ocean
	NPFC Rules of Procedure
CMM 15-02	CMM15-02_Conservation and Management Measure for Pacific Saury
CMM 2016-01	CMM On Information Requirements For Vessel Registration
CMM 2016-02	CMM To Establish A List Of Vessels Presumed To Have Carried Out IUU Activities In The NPFC CA
CMM 2016-03	CMM On The Interim Transshippment Procedures For The NPFC
CMM 2016-04	CMM On Vessels Without Nationality
CMM 2016-05	CMM For Bottom Fisheries And Protection Of VMEs In The NW Pacific Ocean
CMM 2016-06	CMM For Bottom Fisheries And Protection Of VMEs In The NE Pacific Ocean
CMM 2016-07	CMM For Chub Mackerel

WORKING PAPERS

Symbol	Title
NPFC-2017-SC02-WP01	Draft 2017-2021 Research Plan
NPFC-2017-SC02-WP02	Information On Exploratory Fishery Targeting Deep Water Crabs In The NPFC Convention Area
NPFC-2017-SC02-WP03	Draft NPFC Information Security Guidelines
NPFC-2017-SC02-WP04 (Rev.1)	Data Management System
NPFC-2017-SC02-WP05	Suggestions for the 2017-2021 Research Plan
NPFC-2017-SC02-WP06	Items of "Special Projects Funds" for Scientific Projects

INFORMATION PAPERS

Symbol	Title
NPFC-2017-SC02-IP01	NPFC Information Security and Management System
NPFC-2017-SC02-IP02	Global Review Of Alfonsino (Beryx Spp.), Their Fisheries, Biology And Management
NPFC-2017-SC02-IP03	Small Pelagic Fish Symposium
NPFC-2017-SC02-IP04	Example Of NPFC Transshipment Information

OBSERVER PAPERS

Symbol	Title
NPFC-2017-SSC VME02-OP01	The ABNJ Deep Seas Project UPDATE to the NPFC Scientific Committee
NPFC-2017-SC02-OP01	NPAFC presentation
NPFC-2017-SC02-OP02	PICES presentation

REPORTS FROM WORKING GROUPS AND SSCs

Symbol	Title
NPFC-2017-WS CM01-Final Report	Chub Mackerel Workshop Final Report
NPFC-2017-SSC-VME02- Draft Report	Vulnerable Ecosystems SSC – Draft Report
NPFC-2017-SSC-NPA02- Draft Report	North Pacific Armorhead SSC – Draft Report
NPFC-2017-SSC-PS02- Draft Report	Pacific Saury SSC – Draft Report

ANNUAL REPORTS

Symbol	Title
NPFC-2017-AR Canada	2016 Annual Report of Canada
NPFC-2017-AR China	2016 Annual Report of China
NPFC-2017-AR Japan (Rev 1)	2016 Annual Report of Japan (Rev 1)
NPFC-2017-AR Korea	2016 Annual Report of Republic of Korea
NPFC-2017-AR Chinese Taipei	2016 Annual Report of Chinese Taipei
NPFC-2017-AR Russia	2016 Annual Report of Russian Federation
NPFC-2017-AR United States of America	2016 Annual Report of United States of America
NPFC-2017-AR-Annual Summary Footprint - Bottom Fisheries	Annual Summary Footprint For Bottom Fisheries In The NPFC Area Of Competence
NPFC-2017-AR-Annual Summary Footprint - Pacific Saury	Annual Summary Footprint For Pacific Saury In The NPFC Area Of Competence
NPFC-2017-AR-Annual Summary Footprint - Squids	Annual Summary Footprint For Squids In The NPFC Area Of Competence
NPFC-2017-AR-Annual Summary Footprint – Chub and Spotted Mackerels	Annual Summary Footprint For Chub and Spotted Mackerels In The NPFC Area Of Competence

Annex C

PARTICIPANTS LIST

CHAIR

Joji MORISHITA
Tokyo University of Marine Science and Technology
Tel: +81-45-788-7630
E-mail: jmoris0@kaiyodai.ac.jp

CANADA

Eddy Kennedy
Adviser
Department of Fisheries and Oceans Canada
Tel: 2507563360
E-mail: Eddy.Kenndy@dfo-mpo.gc.ca

CHINA

Siquan TIAN
Head of Delegation
Shanghai Ocean University
Tel: +86-21-61900221
E-mail: sqtian@shou.edu.cn

Chuanxiang HUA
Alternative Representative
Shanghai Ocean University
Tel: +86-18512186362
E-mail: cxhua@shou.edu.cn

Bai LI
Alternative Representative
Shanghai Ocean University
E-mail: bai.li@maine.edu

Lianyong FANG
Alternative Representative
China Overseas Fisheries Association
E-mail: admin1@tuna.org.cn

Yong CHEN
Adviser
Shanghai Ocean University
E-mail: cheny@shou.edu.cn

Xjchen CHEN
Adviser
Shanghai Ocean University
E-mail: xjchen@shou.edu.cn

Xiaoxue DU
Adviser
Shanghai Ocean University
Tel: +86-15800718516
E-mail: 532054501@qq.com

Yangyang CHEN
Adviser
Shanghai Ocean University
Tel: +86-1312236193
E-mail: 601812855@qq.com

Zhou FANG
Adviser
Shanghai Ocean University
Tel: +86-13248263281
E-mail: zfang@shou.edu.cn

Na LI
Adviser
Shanghai Ocean University
Tel: +86-13122412661
E-mail: 694705972@qq.com

Mengying LIU
Adviser
Shanghai Ocean University
Tel: +86-18017872811
E-mail: lmy_spongebob@163.com

Wei YU
Adviser
Shanghai Ocean University
Tel: +86-18817590945
E-mail: wyu@shou.edu.cn

Libin DAI
Adviser
Shanghai Ocean University
Tel: +86-13671730800
E-mail: 644318716@qq.com

Mengyao WU
Adviser
Shanghai Ocean University
Tel: +86-18817772117
E-mail: 971366877@qq.com

Peng CHEN
Adviser
Shanghai Ocean University
Tel: +86-18801771401
E-mail: pengchen@yeah.net

Lyu Ze HUA
Adviser
Shanghai Ocean University
Tel: +86-15121047687
E-mail: zhlw@shou.edu.cn

Tongjia QI
Adviser
Shanghai Ocean University
Tel: +86-18817570524
E-mail: vocal_tongjia@163.com

Leilei ZOU
Interpreter
Shanghai Ocean University
Tel: +86-15692165709
E-mail: llzou@shou.edu.cn

JAPAN

Toshihide IWASAKI
Head of Delegation
Tohoku National Fisheries Research Institute
Tel: +81-178-33-1500
E-mail: tiwasaki@affrc.go.jp

Taro ICHII
Alternative Representative
National Research Institute of Far Seas Fisheries
Tel: +81-45-788 7500
E-mail: ichii@affrc.go.jp

Masashi KIYOTA
Alternative Representative
National Research Institute of Far Seas Fisheries

Tel: +81-45-788 7505
E-mail: kiyo@affrc.go.jp

Shiroh YONEZAKI
Adviser
National Research Institute of Far Seas Fisheries
Tel: +81-45-788 7501
E-mail: yonez@affrc.go.jp

Momoko ICHINOKAWA
Adviser
National Research Institute of Fisheries Science
E-mail: ichimomo@affrc.go.jp

Kengo TANAKA
Adviser
Fisheries Agency
E-mail: kengo_tanaka880@maff.go.jp

Hideaki KIDOKORO
Adviser
Tohoku National Fisheries Research Institute
E-mail: kidokoro@affrc.go.jp

Kiichiro KAZAWA
Adviser
National saury stick-held-dipnet fishery co-operation
E-mail: zen@samma.jp

Naohiko AKIMOTO
Adviser
Japan Overseas Fishing Association
E-mail: naohiko@sol.dti.ne.jp

KOREA

Seok-Gwan CHOI
Head of Delegation
National Institute of Fisheries Science
E-mail: sgchoi@korea.kr

Eunjung KIM
Alternative Representative
National Institute of Fisheries Science
E-mail: eunjung.hawaii@gmail.com

Sanggyu SHIN
Adviser
National Institute of Fisheries Science
E-mail: gyuyades82@gmail.com

Sangdeok CHUNG
Adviser
National Institute of Fisheries Science
E-mail: sdchung@korea.kr

RUSSIA

Kirill KOLONCHIN
Head of Delegation
Russian Federal Research Institute of Fisheries and Oceanography
E-mail: kolonchin@vniro.ru

Igor MELNIKOV
Alternative Representative
Pacific Scientific Research Fisheries Centre
Tel: +7-9147047863
E-mail: igor.melnikov@tinro-center.ru

Pavel AFANASYEV
Adviser
Russian Federal Research Institute of Fisheries and Oceanography
E-mail: afanasiev@vniro.ru

Vladimir KULIK
Adviser
Pacific Scientific Research Fisheries Centre
E-mail: vladimir.kulik@tinro-center.ru

Dmitrii ANTONENKO
Adviser
Pacific Scientific Research Fisheries Centre
Tel: +7-9146978130
E-mail: dmantonenko@yandex.ru

CHINESE TAIPEI

Shih-Hsun LIN
Head of Delegation
Fisheries Agency
E-mail: shihhsun@ms1.fa.gov.tw

Mei-Chin JUAN
Adviser
Fisheries Agency
E-mail: meichin@ms1.fa.gov.tw

Wen-Bin HUANG
Adviser
National Dong Hwa University
E-mail: bruce@mail.ndhu.edu.tw

Chih-Hao HSIEH
Adviser
National Taiwan University
E-mail: chsieh@ntu.edu.tw

Tang-Huei LEE
Adviser
Taiwan Squid Fishery
E-mail: nancy@squid.org.tw

Chun-Chieh HUNG
Adviser
F.C.F. Fishery Co., Ltd.
E-mail: henry@fcf.com.tw

USA

Loh-Lee LOW
Adviser
NOAA (Retired)
Tel: +1-2063847518
E-mail: LowLohLee@gmail.com

OBSERVERS

VANUATU

Lucy Joy ANDREA
Alternative Representative
Department of Fisheries
Tel: +678-33025
E-mail: ljoy@vanuatu.gov.vu

Kevin LIN
Alternative Representative
Ming Dar Fishery Co., Ltd.
E-mail: kevin.mdfc@msa.hinet.net

FAO

Chris O'BRIEN
ABNJ Deep Seas Project, FAO
E-mail: chris.obrien@fao.org

NPAFC

Igor MELNIKOV
Pacific Scientific Research Fisheries Centre
Tel: +7-9147047863
E-mail: igor.melnikov@tinro-center.ru

PICES

Vladimir KULIK
Pacific Scientific Research Fisheries Centre
E-mail: vladimir.kulik@tinro-center.ru

NPFC SECRETARIAT

Dae-Yeon MOON
Executive Secretary
Tel: +81-3-5479-8717
E-mail: dymoon@npfc.int

Aleksandr ZAVOLOKIN
Science Manager
Tel: +81-3-5479-8717
E-mail: azavolokin@npfc.int

Peter FLEWWELLING
Compliance Manager
Tel: +81-3-5479-8717
E-mail: pflewwelling@npfc.int

Yuko YOSHIMURA-TAKAMIYA
Executive Assistant
Tel: +81-3-5479-8717
E-mail: ytakamiya@npfc.int

Mervin OGAWA
Data Coordinator
Tel: +81-3-5479-8717
E-mail: mogawa@npfc.int

Alexander MEYER
Rapporteur, Urban Connections
Tel: +81-3-6432-5691
E-mail: meyer@urbanconnections.jp

Annex D

REVISION FOR CONSERVATION AND MANAGEMENT MEASURE 2016-06 FOR BOTTOM FISHERIES AND PROTECTION OF VULNERABLE MARINE ECOSYSTEMS IN THE NORTHEASTERN PACIFIC OCEAN

The North Pacific Fisheries Commission (NPFC):

Seeking to ensure the long term conservation and sustainable use of the fishery resources of the Northeastern Pacific Ocean and, in so doing, protect the vulnerable marine ecosystems that occur there, in accordance with the Sustainable Fisheries Resolutions adopted by the United Nations General Assembly (UNGA) including, in particular, paragraphs 66 to 71 of the UNGA59/25 in 2004, paragraphs 69 to 74 of UNGA60/31 in 2005, paragraphs 69 and 80 to 91 of UNGA61/105 in 2006, and paragraphs 113 to 124 of UNGA64/72 in 2009;

Recalling that paragraph 85 of UNGA 61/105 calls upon participants in negotiations to establish regional fisheries management organizations or arrangements with the competence to regulate bottom fisheries to adopt permanent measures in respect of the area of application of the instruments under negotiation;

Noting that North Pacific Fisheries Commission has previously adopted interim measures for the Northeastern Pacific Ocean;

Conscious of the need to adopt permanent measures for the Northeastern Pacific Ocean to ensure that this area is not left as the only major area of the Pacific Ocean where no such measures are in place;

Hereby adopt the following Conservation and Management Measure (CMM) for bottom fisheries of the Northeastern Pacific Ocean while working to develop and implement other permanent management arrangements to govern these and other fisheries in the North Pacific Ocean.

Scope

1. These Measures are to be applied to all bottom fishing activities throughout the high seas areas of the Northeastern 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 east of the line of 175 degrees W longitude (here in after called “the eastern part of the Convention Area”) including all such areas and marine species other than those species already covered by existing international

fisheries management instruments, including bilateral agreements and Regional Fisheries Management Organizations or Arrangements.

For the purpose of these Measures, the term vulnerable marine ecosystems is to be interpreted and applied in a manner consistent with the International Guidelines on the Management of Deep Sea Fisheries on the High Seas adopted by the FAO on 29 August 2008 (see Annex 2 for further details).

2. The implementation of these Measures shall:
   a. be based on the best scientific information available in accordance with existing international laws and agreements including UNCLOS and other relevant international instruments,
   b. establish appropriate and effective conservation and management measures,
   c. be in accordance with the precautionary approach, and
   d. incorporate an ecosystem approach to fisheries management. ~~Actions by Members of the Commission~~

3. Actions by Members of the Commission

Members of the Commission will take the following actions in respect of vessels operating under its Flag or authority in the area covered by these Measures:

   a. Conduct the assessments called for in paragraph 83(a) of UNGA Resolution 61/105, in a manner consistent with the FAO Guidelines and the Standards and Criteria included in Annex 2;
   b. Submit to the SC their assessments conducted pursuant to subparagraph (a) of this paragraph, including all relevant data and information in support of any such assessment, and receive advice and recommendations from the SC, in accordance with the procedures in Annex ~~2~~3;
   c. Taking into account all advice and recommendations received from the SC, determine whether the fishing activity or operations of the vessel in question are likely to have a significant adverse impact on any vulnerable marine ecosystem;
   d. If it is determined that the fishing activity or operations of the vessel or vessels in question would have a significant adverse impact on vulnerable marine ecosystems, adopt conservation and management measures to prevent such impacts on the basis of advice and recommendations of the SC, which are subject to adoption by the Commission;
   e. Ensure that if any vessels are already engaged in bottom fishing, that such assessments have been carried out in accordance with paragraph 119(a)/UNGA RES 2009, the determination called for in subparagraph (c) of this paragraph has been rendered and, where appropriate, managements measures have been implemented in accordance with the advice and recommendations of the SC, which are subject to adoption by the Commission;
   f. Further ensure that they will only authorize fishing activities on the basis of such assessments

and any comments and recommendations from the SC;

g. Prohibit its vessels from engaging in directed fishing on the following orders: Alcyonacea, Antipatharia, Gorgonacea, and Scleractinia as well as any other indicator species for vulnerable marine ecosystems as may be identified from time to time by the SC and approved by the Commission;

h. In respect of areas where vulnerable marine ecosystems are known to occur or are likely to occur, based on the best available scientific information, ensure that bottom fishing activities do not proceed unless conservation and management measures have been established to prevent significant adverse impacts on vulnerable marine ecosystems;

i. Limit fishing effort in bottom fisheries on the Eastern part of the Convention Area to the level of a historical average (baseline to be determined through consensus in the SC based on information to be provided by Members) 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 dependent on new SC advice;

j. Further, considering accumulated information regarding fishing activities in the Eastern part of the Convention Area, in areas where, in the course of fishing operations, cold water corals or other indicator species as identified by the SC that exceed 50Kg 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 2 nautical miles, so that additional encounters with VMEs are unlikely. All such encounters, including the location and the species in question, shall be reported to the Secretariat, who shall notify the other Members of the Commission so that appropriate measures can be adopted in respect of the relevant site. It is agreed that the cold water corals include: Alcyonacea, Antipatharia, Gorgonacea, and Scleractinia, as well as any other indicator species for vulnerable marine ecosystems as may be identified from time to time by the SC and approved by the Commission.

~~3.~~4. All assessments and determinations by any Member as to whether fishing activity would have significant adverse impacts on vulnerable marine ecosystems, as well as measures adopted in order to prevent such impacts, will be made publicly available through agreed means.

Control of Bottom Fishing Vessels

~~4.~~5. Members will exercise full and effective control over each of their bottom fishing vessels operating in the high seas of the Northeastern Pacific Ocean, including by means of fishing licenses, authorizations or permits, and maintenance of a record of these vessels as outlined in the Convention and applicable CMM.

~~5.~~6. New and exploratory fishing will be subject to the exploratory fishery protocol included as Annex 1.

Scientific Committee (SC)

~~6.~~7. Scientific Committee will provide scientific support for the implementation of these CMMs.

Scientific Information

~~7.~~8. The Members shall provide all available information as required by the Commission for any current or historical fishing activity by their flag vessels, including 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 or coordinates of seamounts), and information from scientific observer programmes (see Annexes 4 and 5) to the NPFC Secretariat as soon as possible and no later than one month prior to SC meeting. The Secretariat will make such information available to SC.

~~8.~~9. Scientific research activities for stock assessment purposes are to be conducted in accordance with a research plan that has been provided to SC prior to the commencement of such activities.

Annex 1

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:

(1) 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.

(2) The assessment in (1) 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.

(3) The SC is to review the information and the assessment submitted in (1) above in accordance with "SC Assessment Review Procedures for Bottom Fishing Activities (Annex 3)."

(4) 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.

~~Appendix~~ Annex 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~~ Annex 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[1] 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 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).

[1] "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.

(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, i~~For example, 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 ES-NHR area~~, or ~~each~~ an individual seamount in the ~~ES-NHR area~~Convention 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~~ two types of fishing gear are currently used by ~~the~~ members of the Commission in the NE ~~ES-NHR~~ area, namely long-line hook and long-line trap~~, 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~~ The footprint of the bottom fisheries (fished seamounts) is identified based on the available fishing record. The following seamounts have been identified as fished seamounts at some point in the past: Brown Bear, Cobb, Warwick, Eickelberg, Pathfinder, Miller, Murray, Cowie, Surveyor, Pratt, and Durgin. ~~The following seamounts have been identified as fished seamounts: Suiko, Showa, Youmei, Nintoku, Jingu, Ojin, Northern Koko, Koko, Kinmei, Yuryaku, Kammu, Colahan, and C-H. Since the use of most of these gears in the ES-NHR area dates back to the late-1960s and 1970s, it~~ 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.

(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 coldwater corals, e.g., reef builders and coral forest including: stony corals (scleractinia), alcyonaceans and gorgonians (octocorallia), 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).

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, 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)

Annex 3

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.

Annex 4

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. Tag Return Monitoring

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

E. 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.

Annex 5

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 vessel data are to be collected for each observed trip:
   a) Current vessel flag.
   b) Name of vessel.
   c) Name of the Captain.
   d) Name of the Fishing Master.
   e) Registration number.
   f) International radio call sign (if any).
   g) Lloyd's / IMO number (if allocated).
   h) Previous Names (if known).
   i) Port of registry.
   j) Previous flag (if any).
   k) Type of vessel.
   l) Type of fishing method(s).
   m) Length (m).
   n) Beam (m).
   o) Gross register tonnage (international tonnage).
   p) Power of main engine(s) (kilowatts).
   q) Hold capacity (cubic metres).
   r) Record of the equipment on board which may affect fishing power factors (navigational equipment, radar, sonar systems, weather fax or satellite weather receiver, sea-surface temperature image receiver, Doppler current monitor, radio direction finder).
   s) Total number of crew (all staff, excluding observers).

3. The following observer data are to be collected for each observed trip:
   a) Observer's name.
   b) Observer's organisation.
   c) Date observer embarked (UTC date).
   d) Port of embarkation.
   e) Date observer disembarked (UTC date).
   f) 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 (<=1hr or >1hr)
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.
v) Record of sensitive benthic species in the trawl catch, particularly vulnerable or habitat-forming species such as sponges, sea-fans or corals.

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 for the set.
i) Bottom (seabed) depth at start of set.
j) Bottom (seabed) depth at end of set.
k) Number of hooks 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 seample, 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, immature, unsexed)
   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^3)) of each listed benthic species caught in the fishing operation.
   c) An overall estimate of the total quantity (weight (kg) or volume (m^3)) 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:

Species	Priority (1 highest)
Primary target species (such as North Pacific armorhead and splendid alfonsin)	1
Other species typically within top 10 in the fishery (such as mirror dory, and oreos)	2
Protected species	3
All other species	4

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.
    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.

Annex E

REVISION OF CMM 2016-05
CONSERVATION AND MANAGEMENT MEASURE
FOR BOTTOM FISHERIES AND PROTECTION OF VULNERABLE MARINE ECOSYSTEMS IN THE NORTHWESTERN PACIFIC OCEAN

Abstract:

The description of the area of closure of the southeastern portion of Koko Seamount as a precautionary measure to protect possible VMEs in the area was agreed by the Members that fished on Koko Seamount during the Preparatory Conference in Busan in 2009, however the precise coordinates were not reflected in actual CMM 2016-05 for Bottom Fisheries and Protection of Vulnerable Marine Ecosystems in the Northwestern Pacific Ocean approved by the Commission in 2016.

The purpose of this revision is to include the coordinates of that portion of the southeastern Koko Seamount.

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;

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 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 these fisheries on marine species and VMEs;

Concerned about possible adverse impacts of unregulated expansion of bottom fisheries on marine species and VMEs in the western part of the Convention Area.

Adopts the following Conservation and Management Measure:

1. Scope

A. Coverage

These Measures are to be applied to all bottom fishing activities 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 (here in after called “the western part

of the Convention Area") including all such areas and marine species other than those species already covered by existing international fisheries management instruments, including bilateral agreements and Regional Fisheries Management Organizations or Arrangements.

B. Management target

Bottom fisheries conducted by vessels operating in the western part of the Convention Area.

2. General purpose

Sustainable management of fish stocks and protection of VMEs in the western part of the Convention Area.

The objective of these Measures 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. These measures shall set out 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 re-evaluate, and as appropriate, revise, the definition based on further consideration of the work done through FAO and by NPFC.

3. Principles

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.

4. Measures

Members of the Commission shall take 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 refrain from 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 Deep-sea 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 orders: Alcyonacea, Antipatharia, Gorgonacea, and Scleractinia 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.

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 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 2 nautical miles, so that additional encounters with VMEs are unlikely. All such encounters, including the location and the species in question, shall be

reported to the Secretariat, who shall notify the other Members of the Commission so that appropriate measures can be adopted in respect of the relevant site. It is agreed that the cold water corals include: Alcyonacea, Antipatharia, Gorgonacea, and Scleractinia.

H. C-H seamount and Southeastern part of Koko seamount, specifically for the latter seamount, 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 precautionary for potential VME conservation. Fishing in these areas requires exploratory fishery protocol (Annex 1).

I. Ensure that the distance between the footrope of the gill net and sea floor is greater than 70 cm.

J. Apply a bottom fisheries closure from November to December

K. Limit annual catch of North Pacific armorhead to 15,000 tons for Japan

5. Contingent Action

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 para 4 (C).

6. Scientific Information

To facilitate the scientific work associated with the implementation of these measures, each Member of the Commission shall undertake:

A. Collection of Information for purposes of defining the footprint

In implementing paragraphs 4A and 4B, the 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 Interim Data Handling and Data Sharing Protocol. To support assessments of the fisheries and refinement of conservation and management measures, Members of the Commission are to provide update information on an annual basis.

B. Collection of Information

(i) Collection of scientific information from each bottom fishing vessel operating in the western part of the Convention Area.

a. Catch and effort data

b. Related information such as time, location, depth, temperature, etc.

(ii) As appropriate the collection of information from research vessels operating in the western part of the Convention Area.

a. Physical, chemical, biological, oceanographic, meteorological, etc.

b. Ecosystem surveys.

(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.

7. Control of bottom fishing vessels

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.

8. Observers

All vessels authorized to bottom fishing in the western part of the Convention Area shall carry an observer on board.

Annex 1

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:

(1) 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.

(2) The assessment in (1) 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.

(3) The SC is to review the information and the assessment submitted in (1) above in accordance with "SC Assessment Review Procedures for Bottom Fishing Activities (Annex 3)."

(4) 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.

Annexppendix 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)

Annexppendix 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[2] 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 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

[2] "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.

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 ES-NHR 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 C-H. 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.

(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 coldwater corals, e.g., reef builders and coral forest including: stony corals (scleractinia), alcyonaceans and gorgonians (octocorallia), 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).

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, 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)

Annex 3

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.

Annex 4

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. Tag Return Monitoring

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

E. 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.

Annex 5

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 vessel data are to be collected for each observed trip:
   a) Current vessel flag.
   b) Name of vessel.
   c) Name of the Captain.
   d) Name of the Fishing Master.
   e) Registration number.
   f) International radio call sign (if any).
   g) Lloyd's / IMO number (if allocated).
   h) Previous Names (if known).
   i) Port of registry.
   j) Previous flag (if any).
   k) Type of vessel.
   l) Type of fishing method(s).
   m) Length (m).
   n) Beam (m).
   o) Gross register tonnage (international tonnage).
   p) Power of main engine(s) (kilowatts).
   q) Hold capacity (cubic metres).
   r) Record of the equipment on board which may affect fishing power factors (navigational equipment, radar, sonar systems, weather fax or satellite weather receiver, sea-surface temperature image receiver, Doppler current monitor, radio direction finder).
   s) Total number of crew (all staff, excluding observers).

3. The following observer data are to be collected for each observed trip:
   a) Observer's name.
   b) Observer's organisation.

c) Date observer embarked (UTC date).
d) Port of embarkation.
e) Date observer disembarked (UTC date).
f) 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 (<=1hr or >1hr)
   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.
   v) Record of sensitive benthic species in the trawl catch, particularly vulnerable or habitat-forming species such as sponges, sea-fans or corals.

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 for the set.
   i) Bottom (seabed) depth at start of set.
   j) Bottom (seabed) depth at end of set.
   k) Number of hooks 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 seample, 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, immature, unsexed)
   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^3)) of each listed benthic species caught in the fishing operation.
   c) An overall estimate of the total quantity (weight (kg) or volume (m^3)) 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:

Species	Priority (1 highest)
Primary target species (such as North Pacific armorhead and splendid alfonsin)	1
Other species typically within top 10 in the fishery (such as mirror dory, and oreos)	2
Protected species	3
All other species	4

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.
   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.

Annex F

Scientific Projects proposed by the Scientific Committee

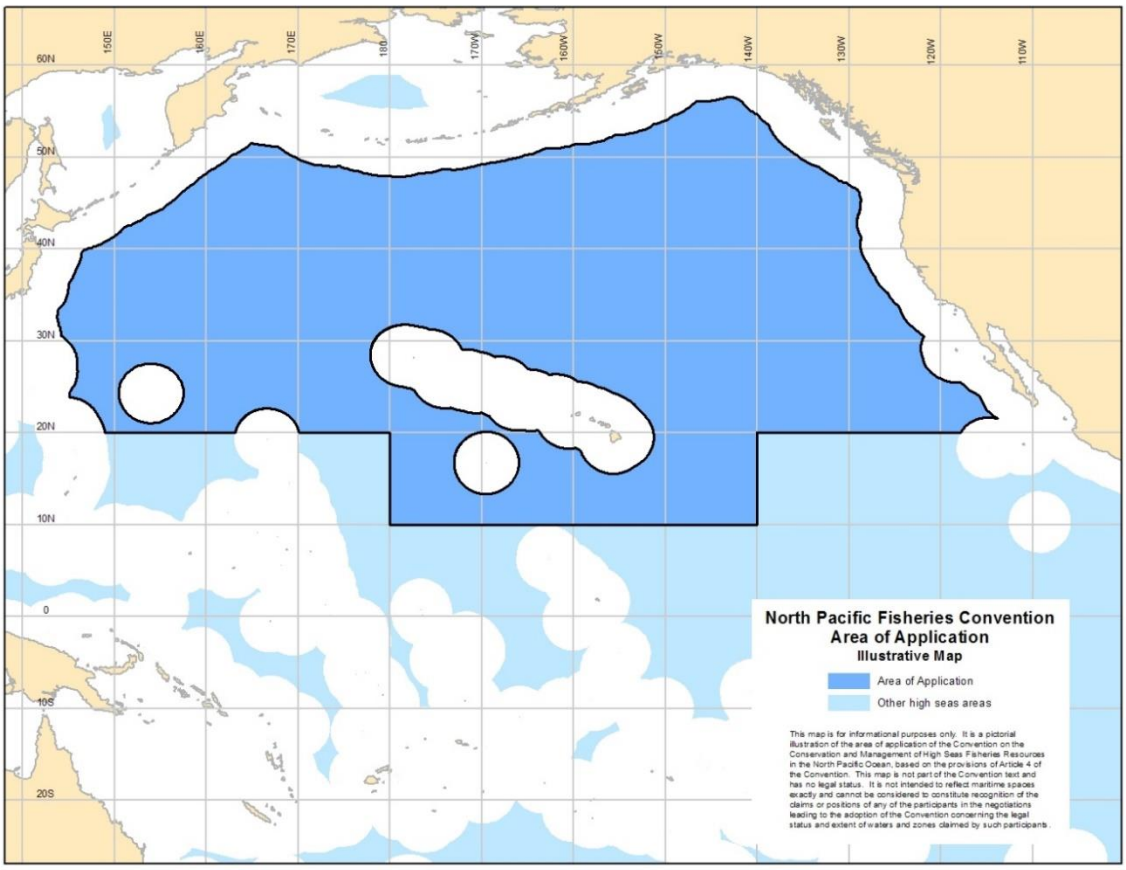
#	Project	Time	Rough estimation of required funds
1	VME workshop (SAI + data)	2018	1,240,000 JPY (about 10,000 USD) and also supported by ABNJ project, FAO
2	VME identification guide (printing and travel costs of key developers)	2017	1,180,000 JPY (about 9,500 USD)
3	GIS database/module as a part of NPFC database management system for spatial management of bottom fisheries and VMEs	?2018-2019	For ArcGIS: 5,470,000 JPY – about 44 thousand USD (first year: license fee+ spatial analysis) and 1,120,000 JPY – about 9 thousand USD (subsequent year: maintenance fee per year). Solutions other than ArcGIS should be considered.
4	TWG PSSA meeting (meeting costs and travel cost for 2 participants of each Member)	Every year from 2017-2021	2,490,000 JPY (about 20,000 USD)
5	Expert to review Pacific saury stock assessment (probably consultant fee and travel cost)	TBD later	TBD
6	Observer Program		TBD
7	Chub mackerel meeting (meeting costs and travel cost for 2 participants of each Member)	Every year, TBD by the Commission	2,490,000 JPY (about 20,000 USD)
8	MSE workshop	TBD	TBD
9	Special Science Project Fund		All unspent scientific funds to use for future projects identified above for 2018 and subsequent years.

Annex G

North Pacific Fisheries Commission
Scientific Committee

2017-2021 Research Plan

1.0 CONTEXT



Illustrative Map of the North Pacific Fisheries Commission Convention Area

Article 10, Section 4(a) of the *Convention on the Conservation and Management of High Seas Fisheries Resources in the North Pacific Ocean* states that the Scientific Committee (SC) will "recommend to the Commission a research plan including specific issues and items to be addressed by the scientific experts or by other organizations or individuals, as appropriate, and identify data needs and coordinate activities that meet those needs."

An initial draft of this work plan was presented for review during the 4th Preparatory Conference and a subsequent discussion was held by a small working group to establish science priorities for the NPFC. This plan draws on those discussions and was updated by the SC Chair based on the progress made by NPFC since that Conference.

The development of multi-year science research or work plans is common across regional fisheries management organizations as well as domestic fisheries science agencies. This draft plan draws on such examples, and has been developed for consideration by the SC before it may be adopted by the Commission.

2.0 OBJECTIVES

The research plan is intended to guide the work of the Scientific Committee by identifying key research priorities and associated areas of work to be undertaken or maintained. The plan should also serve to: ensure efficient utilization of scarce resources within the Commission; inform Parties' domestic research planning as a means to complementing the Commission's science activities; and, help the Commission identify potential sources of external funding.

It is not intended as an exhaustive plan describing all research activities that may be carried out by Parties, nor is it intended to preclude work already taking place. The plan should support the Commission's primary objective (*Article 2* in the Convention), which 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 plan should also help the Scientific Committee fulfill its functions as specified in the Convention.

3.0 PRIORITY RESEARCH AREAS

In addition to discussions held during the Preparatory Conference (referenced above) followed by the Commission and Scientific Committee after their establishment, the identification of priority research areas draws largely from the Commission's Convention, which outlines specific functions for the Scientific Committee in *Article 10, Section 4*. These priority research areas are subject to the approval of the Commission, and may be revisited and/or revised as deemed appropriate by the Commission. Proposed five-year work plans for each priority area are available in the attached Annex I.

The proposed priority research areas are:

1. Stock assessments for target fisheries and bycatch species

2. Ecosystem approach to fisheries
3. Vulnerable Marine Ecosystems
4. Data collection, management and security

3.1 Stock Assessments

Rationale

Accurate stock assessments are critical in helping to ensure the long-term conservation and sustainable use of fisheries resources in the Convention Area. One of primary functions of the Commission is setting total allowable catch or total allowable level of fishing effort, and as per *Article 7-1(b)*, this is to be in "accordance with the advice and recommendations of the Scientific Committee".

Consistent with this, *Article 10-4(b)* states that one of the functions of the Scientific Committee is to "regularly plan, conduct and review the scientific assessments of the status of fisheries resources in the Convention Area, identify actions required for their conservation and management, and provide advice and recommendations to the Commission".

Finally, *Article 10-4(i)* states that the Committee shall also "develop rules and standards, for adoption by the Commission, for the collection, verification, reporting, and the security of, exchange of, access to and dissemination of data on fisheries resources, species belonging to the same ecosystem, or dependent upon or associated with the target stocks and fishing activities in the Convention Area".

The Scientific Committee should endeavour to understand the current status and trends in production of populations of priority species as agreed by the 2nd Commission meeting in 2016, as well as factors that may affect future trends.

Areas of work

- **Development of baseline assessment of the status of priority stocks**
- **Review of existing data standards in relation to stock assessments (e.g. Annual Report template, future vessel monitoring system)**
- Stock delineation of important commercial species for the purpose of providing advice for the determination of management units

- For each commercial species, determination of data requirement, including data availability and data gaps; identification, where possible, of strategies to fill the data gaps, including for bycatch
- Development of a standardized method to provide advice to the Commission
- Development of assessment models by species and research as required to determine various assessment parameters

3.1.1. Pelagic fish stock assessment

Rationale

Pelagic fish and squids are primary fisheries resources for NPFC Members. They comprised more than 99% of total catch of species covered by the Convention. Many of them are migratory species with wide geographical distributions which include both EEZs of the North Pacific Rim countries and High Seas. Management of such stocks requires close cooperation among Members concerned to ensure sustainable use and conservation of fisheries resources.
Four fish species and two squid species were recognized by the Scientific Committee as priority species: Pacific saury *Cololabis saira*, Chub mackerel *Scomber japonicus*, Spotted mackerel *Scomber australasicus*, Japanese sardine *Sardinops melanostictus*, Neon flying squid *Ommastrephes bartramii*, Japanese flying squid *Todarodes pacificus*.

Areas of work

- Completion of stock assessment for Pacific saury and development of the framework and timeline for its regular improvement and update
- Conducting stock assessment for Chub mackerel and other priority species considering their top-down prioritization (Spotted mackerel - Japanese sardine - Neon flying squid - Japanese flying squid) and available funds and capacity
- Identification of data gaps, determination of activities to address those gaps and development of standards and mechanisms for data collection and verification

3.1.2. Bottom fish stock assessment

Rationale

Data used for traditional stock assessment are sparse for bottom fish, and it is unlikely that traditional methods will be applicable for most deepwater species in the Convention Area. In

addition, some bottom species have unique life cycles, sporadic recruitment patterns and irregular spawning-recruitment relationships that also makes difficult accurate stock assessment. All these require specific approaches for management and sustainable use of bottom fisheries resources.
More than ten bottom species have been exploited by fisheries in the Convention Area last decade. Two fish are recognized as priority species: North Pacific armorhead (NPA) *Pentaceros wheeleri*, Splendid alfonsino *Beryx splendens*.

Areas of work

- Review of approaches applicable for stock assessment of target bottom species and investigate various management strategies
- Further development of the Adaptive Management approach for NPA and mechanism for its implementation
- Identification of data needs and establishment of activities to fill data gaps

3.2 Ecosystem Approach to Fisheries

Rationale

Article 3 (c) in the Convention states that: "In giving effect to the objective of this Convention, the following actions shall be taken individually or collectively as appropriate:
(c) adopting and implementing measures in accordance with the precautionary approach and an ecosystem approach to fisheries, and in accordance with the relevant rules of international law, in particular as reflected in the 1982 Convention, the 1995 Agreement and other relevant international instruments".

Article 7-1 (c,d) in the Convention states that the Commission shall: "adopt, where necessary, conservation and management measures for species belonging to the same ecosystem or dependent upon or associated with the target stocks"; and, "adopt, where necessary, management strategies for any fisheries resources and for species belonging to the same ecosystem or dependent upon or associated with the target stocks, as may be necessary to achieve the objective of this Convention."

Article 10-4 (d) states that the Scientific Committee shall "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."

Areas of work

- Formulation of a research plan on how to implement the ecosystem approach to fisheries in the Convention Area
- Vulnerable Marine Ecosystems
- Understand ecological interactions among species
- Ecosystem modelling
- Evaluate impacts of fishing on fisheries resources and their ecosystem components, including bycatch species
- Other issues related to marine ecosystem including marine debris and polution

3.2.1 Vulnerable Marine Ecosystems

Rationale

The identification of vulnerable marine ecosystems is a necessary precursor to implementing measures to protect these ecosystems, and such measures are explicitly called for in the Convention (e.g. *Article 7-1(e)*).

Article 10-4 (e) states that the Scientific Committee shall "develop a process to identify vulnerable marine ecosystems, including relevant criteria for doing so, and identify, based on the best scientific information available, areas or features where these ecosystems are known to occur, or are likely to occur, and the location of bottom fisheries in relation to these areas or features, taking due account of the need to protect confidential information."

Article 7-1 (e) states that the Commission shall "adopt conservation and management measures to prevent significant adverse impacts on vulnerable marine ecosystems in the Convention Area, including but not limited to: measures for conducting and reviewing impact assessments to determine if fishing activities would produce such impacts on such ecosystems in a given area; measures to address unexpected encounters with vulnerable marine ecosystems in the course of normal bottom fishing activities; and as appropriate, measures that specify locations in which fishing activities shall not occur."

To date, Japan, Russia, Korea, the US and Canada have completed a report on identification of VMEs and an assessment of impacts caused by bottom fishing activities on VMEs and marine species. The Scientific Committee may build on these reports, which will be kept up to date by respective Parties.

Areas of work

- **Review existing NPFC standards on VME data collection, including guidelines set forth in the CMMs for bottom fisheries and protection of vulnerable marine ecosystems in the northwestern and northeastern Pacific Ocean (CMM 2016-05 and CMM 2016-06), and determine if any modifications to these standards are needed in the short-term and/or longer term**
- **Review of Encounter Protocol for bottom fisheries on Vulnerable Marine Ecosystems**
- Determination of data requirements and identification of what data may be collected through commercial fishing operations
- Develop consensus on criteria used to identify VMEs and how this might be applied in the NPFC (note that guidelines from the FAO are already referenced in Annex 2 of the CMM 2016-05 and CMM 2016-06)
- Analysis of known or suspected VMEs in the Convention Area
- Surveys of VMEs for data collection
- Development of a framework to conduct assessments of Impacts of Bottom Fishing Activities on Vulnerable Marine Ecosystems

3.2.1.1 Review of Encounter Protocol for bottom fisheries on Vulnerable Marine Ecosystems

Rationale

The purposes of VME encounter protocols in NPFC Convention Area include:
• Ensuring early detection and protection of potential VMEs within an existing fishing area;
• Ensuring early detection and protection of potential VME within an unfished area;
• Documenting information on known occurrences of VME indicators within the Convention Area.

Development of the Encounter Protocol progressed through the Science Working Group and Scientific Committee meetings as well as intersessional activities. VME encounter protocols are incorporated in the CMMs for bottom fisheries and protection of vulnerable marine ecosystems in the northwestern and northeastern Pacific Ocean, CMM 2016-05 and CMM 2016-06, specifically in Para 4(g) and 3(j), respectively.

Areas of Work

Consideration of the following subjects of research and analyses are recommended to further refine encounter protocols in the Convention Area (as notified in Appendix C, NPFC01-2016-SSC-

VME01- Final Report):

- Other taxa, topographical, geographical and geological features that may indicate the presence of VMEs;
- Taxon-specific encounter thresholds and reporting;
- Framework for evaluating the effectiveness of encounter protocols;
- Tiered approach with different encounter protocols associated with different thresholds;
- Gear-specific thresholds to reflect differences in catchability;
- Gear-specific move-on distances to reflect type of gear;
- Different reporting requirements for different catches;
- Tiered approach to reporting bycatch of VME indicator taxa;
- Different encounter protocols for existing and new fishing areas

3.3 Data collection, management and security

Rationale

Many issues related to data collection, management and security are incorporated into the previous categories in Section 3 above. Nevertheless, the Commission has been still setting up and most policies, rules and standards have not been developed yet. Consequently, the Scientific Committee shall pay much attention to these issues at this early stage of its development.

Article 10, paragraph 4 (i) in the Convention states that the functions of the Scientific Committee shall be to: "develop rules and standards, for adoption by the Commission, for the collection, verification, reporting, and the security of, exchange of, access to and dissemination of data on fisheries resources, species belonging to the same ecosystem, or dependent upon or associated with the target stocks and fishing activities in the Convention Area".

Areas of work

- Review of data standards related to stock assessments and other relevant data, including VME data collection and vessel monitoring systems
- Identify data sources to meet data needs for priority areas of work above and develop programs for data collection
- Develop data security policy including data handling and sharing protocol, information confidentiality classification and access control security guideline

4.0 IMPLEMENTATION AND REVIEW

Monitoring the implementation of this Research Plan will be the responsibility of the Chair of the Scientific Committee in collaboration with the Chairs of the Small Scientific Committees and Executive Secretary. Members of the Commission and the Secretariat will share responsibility for implementation of the Plan.

Full implementation of the Research Plan will likely be beyond the means of the Commission's core budget. Extra-budgetary funds from voluntary contributions of Members and other sources will be required and actively sought by the Commission. Nevertheless, adoption of the Plan by the Scientific Committee and subsequent strong support from the Commission is a prerequisite to securing the necessary extra-budgetary funds.

[An independent external review of the Plan may periodically be requested by the SC. The Scientific Committee will be responsible for preparing the terms of reference for the review. The Scientific Committee will present the report of the review to the next regular session of the Commission.]

5.0 SCIENTIFIC COLLABORATION WITH OTHER ORGANIZATIONS

While not included as a priority, *Article 21* of the Convention addresses cooperation with other organizations or arrangements. It calls on the Commission to cooperate, as appropriate, on matters of mutual interest with FAO, other specialized agencies of the FAO and relevant RFMOs. Further, the Commission is called on to develop cooperative working relationships, including potential agreements, with intergovernmental organizations that can contribute to its work.

Article 10 also speaks to this issue in clauses five and six, stating that the Scientific Committee may exchange information on matters of mutual interest with other relevant scientific organizations or arrangements, and that the Committee shall not duplicate the activities of other scientific organizations and arrangements that cover the Convention Area.

The impetus to collaborate is made stronger by the prospect of limited research funding in the Commission, at least in the short-term, but it is also in the best interests of the Commission to seek synergies with other organizations with mutual interests and similar membership (e.g. North Pacific Marine Science Organization and North Pacific Anadromous Fish Commission).

Activities could include:

- Evaluate reports of International Organizations that may be relevant to the functioning of the Scientific Committee
- Identify other organizations with relevant mandates and activities
- Formalize relationships with these organizations (e.g. MOUs, standing invitations to meetings)
- Identify potential funding opportunities

ANNEX I

Five-Year Work Plan for each Priority Area

1. Stock assessments for target fisheries and bycatch species

	2017	2018	2019	2020	2021
Pacific saury	Completed stock assessment (provisional) through TWG PSSA meeting	Evaluate the quality of the data for stock assessment; Update stock assessment and recommendations to Commission to improve conservation and management of Pacific saury	Update/ benchmark stock assessment and recommendations to Commission to improve conservation and management of Pacific saury	Update/ benchmark stock assessment and recommendations to Commission to improve conservation and management of Pacific saury	Update/ benchmark stock assessment and recommendations to Commission to improve conservation and management of Pacific saury
Chub mackerel	Review of Members' national research on stock status and fisheries through CM workshop; Establish TWG for Chub mackerel				
Spotted mackerel		Collect data and monitor situation for further analyses			
Japanese sardine		Collect data and monitor situation			

		for further analyses			
Neon flying squid		Collect data and monitor situation for further analyses			
Japanese flying squid		Collect data and monitor situation for further analyses			
North Pacific armorhead	1. Adopt Adaptive Management process 2. Develop work plan to implement the Adaptive Management process 3. Assess and monitor the status of the stock 4. Conduct affiliated research	1. Develop harvest control rules to conserve stock 2. Assess and monitor the status of the stock 3. Conduct affiliated research	1. Implement harvest control rules 2. Assess and monitor the status of the stock 3. Conduct affiliated research	1. Review monitoring and survey designs 2. Assess and monitor the status of the stock 3. Conduct affiliated research	1. Evaluate Adaptive Management process and refine harvest control rules 2. Assess and monitor the status of the stock 3. Conduct affiliated research
Splendid alfonsino		1. Review monitoring and assessment of the stock 2. Conduct affiliated research	1. Conduct comprehensive stock assessment	1. Develop harvest control rules and management advice	1. Assess and monitor the status of the stock 2. Conduct affiliated research

2. Ecosystem approach to fisheries

	2017	2018	2019	2020	2021
1. Review existing NPFC standards on VME data collection		VME workshop			
2. VME encounter protocols	Identification of fished and unfished areas; Analysis of fishery bycatch in the fished areas	VME workshop	Refinement of encounter protocols for fished areas	Development of encounter protocols for exploratory fishing in unfished areas	
3. Determination of data requirements	Development and validation of the data templates	VME workshop	Review and revise data templates		
4. Develop consensus on criteria used to identify VMEs		VME workshop	Revision of the VME indicator taxa and identification criteria		
5. Analysis of known or suspected VMEs in the CA	Screening out potential VME sites on fished seamounts	VME workshop	Establishment of the conservation framework for known VMEs		
6. Surveys of VMEs for data collection	Data collection through scientific surveys and	Data collection through scientific surveys and	Data collection through scientific surveys and	Data collection through scientific surveys and	Data collection through scientific surveys and

	observers	observers	observers	observers	observers
7. Development of a framework to conduct assessments of Impacts of Bottom Fishing Activities on VMEs	Exploration of the SAI assessment methods for VMEs in the western CA	VME workshop Assessment of the bottom fishery impacts on VMEs	Refinement of the VME conservation measures for the existing fishing grounds	Reinforcement of the experimental fishing protocols for unfished areas	

3. Data collection, management and security

	2017	2018	2019	2020	2021
Data standards	Finalize data collection templates Pacific saury and continue development for bottom fisheries (trawl, gillnet, longline)	Develop data collection templates for chub mackerel, squid and crab fisheries	Revision of data collection templates if necessary	Revision of data collection templates if necessary	Revision of data collection templates if necessary
Data collection	Identifying data needs and data gaps	Identifying data needs and data gaps; enhancement of data collection: fisheries, surveys, Observer program	Identifying data needs and data gaps; enhancement of data collection: fisheries, surveys, Observer program	Identifying data needs and data gaps; enhancement of data collection: fisheries, surveys, Observer program	Identifying data needs and data gaps; enhancement of data collection: fisheries, surveys, Observer program

Data security	Information Security Guidelines	Prioritization of areas of the Information Security and Management System and development of Information Security and Management regulations	Development of Information Security and Management regulations	Development of Information Security and Management regulations	Development of Information Security and Management regulations

4. Other*

	2017	2018	2019	2020	2021
Management Strategy Evaluation					
Data review					

* under development

Annex H

Terms of Reference for the Technical Working Group on Pacific Saury Stock Assessment (TWG PSSA) for 2017-2021

1. To review fishery data
   - Catch series
   - Age/size composition data
   - Others
2. To review fishery-dependent and fishery-independent indices
   - Review/update the existing protocol
   - Review/update the indices
   - Evaluate the quality of the indices
   - Recommendation of future works
3. To review and update biological information/data
   - Stock structure
   - Growth
   - Reproduction and maturity schedule
   - Natural mortality
   - Migration pattern
   - Others
4. To update the stock assessment using "provisional base models" (i.e. Bayesian state-space production models)
   - Review existing protocol
   - Simple update (including projection and evaluation of reference points as well as diagnosis)
   - Consideration of scenarios (for base and sensitivity)
   - Assessment of uncertainty and its implication of management
   - Evaluation/improvement (if necessary) the models
   - Recommendation of the research for future works
5. To explore stock assessment models other than existing "provisional base models"
   - Data invention/availability (including the identification of potential covariates)
   - Initial (and continued) discussion on age-/size/stage-structure models
   - Identification of lack of information/data and limits
   - Recommendation of the research for future works
6. To facilitate data- and code- sharing processes
7. To review/improve presentation of stock assessment results (including stock status summary report in a format to be determined by the Working Group)
8. To explore the design of Management Strategy Evaluation framework

Annex I

Focal points for Scientific Committee and its subsidiary bodies

	Canada	China	Japan	Korea	Russia	Chinese Taipei	USA	Secretariat
Scientific Committee	Eddy Kennedy Eddy.Kennedy@dfo-mpo.gc.ca	Siquan Tian sqtian@shou.edu.cn	**Joji Morishita** jmoris0@kaiyodai.ac.jp	Seok-Gwan Choi sgchoi@korea.kr	Aleksei Baitaliuk aleksei.baitaliuk@tinro-center.ru Pavel Afanasiev afanasiev@vniro.ru	Wen-Bin Huang bruce@mail.ndhu.edu.tw		Aleksandr Zavolokin azavolokin@npfc.int
SSC on Vulnerable Marine Ecosystems	Eddy Kennedy Eddy.Kennedy@dfo-mpo.gc.ca	**Bai Li** bai.li@maine.edu	Masashi Kiyota kiyo@affrc.go.jp	Seok-Gwan Choi sgchoi@korea.kr Eunjung Kim eunjungkim@korea.kr	Vladimir Kulik vladimir.kulik@tinro-center.ru Oleg Katugin oleg.katugin@tinro-center.ru	Wen-Bin Huang bruce@mail.ndhu.edu.tw		Aleksandr Zavolokin azavolokin@npfc.int

SSC on Bottom Fish	Eddy Kennedy Eddy.Kennedy@dfo-mpo.gc.ca	Siquan Tian sqtian@shou.edu.cn	**Taro Ichii** ichii@affrc.go.jp	Seok-Gwan Choi sgchoi@korea.kr Eunjung Kim eunjungkim@korea.kr	Dmitrii Antonenko dmantonenko@yandex.ru Oleg Katugin oleg.katugin@tinro-center.ru	Wen-Bin Huang bruce@mail.ndhu.edu.tw		Aleksandr Zavolokin azavolokin@npfc.int
SSC on Pacific Saury		Siquan Tian sqtian@shou.edu.cn	**Toshihide Iwasaki** tiwasaki@affrc.go.jp	Seok-Gwan Choi sgchoi@korea.kr Eunjung Kim eunjungkim@korea.kr	Vladimir Kulik vladimir.kulik@tinro-center.ru Pavel Afanasiev afanasiev@vniro.ru	Wen-Bin Huang bruce@mail.ndhu.edu.tw		Aleksandr Zavolokin azavolokin@npfc.int
TWG on Pacific Saury Stock Assessment		Siquan Tian sqtian@shou.edu.cn	**Toshihide Kitakado** kitakado@kaiyodai.ac.jp	Jaebong Lee leejb@korea.kr Eunjung Kim eunjungkim@korea.kr	Vladimir Kulik vladimir.kulik@tinro-center.ru Pavel Afanasiev afanasiev@vniro.ru	Wen-Bin Huang bruce@mail.ndhu.edu.tw		Aleksandr Zavolokin azavolokin@npfc.int

TWG on Chub Mackerel		Siquan Tian sqtian@shou.edu.cn	Momoko Ichinokawa ichimomo@affrc.go.jp	Jaebong Lee leejb@korea.kr Eunjung Kim eunjungkim@korea.kr	Vladimir Kulik vladimir.kulik@tinro-center.ru Pavel Afanasiev afanasiev@vniro.ru	Wen-Bin Huang bruce@mail.ndhu.edu.tw		Aleksandr Zavolokin azavolokin@npfc.int
Corresponding Group on DCT for Bottom Fish	Eddy Kennedy Eddy.Kennedy@dfo-mpo.gc.ca	Chuanxiang Hua cxhua@shou.edu.cn	Kota Sawada kotasawada@affrc.go.jp Masashi Kiyota kiyo@affrc.go.jp	**Eunjung Kim** eunjungkim@korea.kr	Vladimir Kulik vladimir.kulik@tinro-center.ru	Wen-Bin Huang bruce@mail.ndhu.edu.tw		Aleksandr Zavolokin azavolokin@npfc.int
Corresponding Group on DCT for Pacific saury		Chuanxiang Hua cxhua@shou.edu.cn	Satoshi Suyama suyama@affrc.go.jp	**Eunjung Kim** eunjungkim@korea.kr	Dmitrii Antonenko dmantonenko@yandex.ru	Wen-Bin Huang bruce@mail.ndhu.edu.tw		Aleksandr Zavolokin azavolokin@npfc.int

Corresponding Group on Data Security Guidelines	Eddy Kennedy Eddy.Kennedy@dfo-mpo.gc.ca	Chuanxiang Hua cxhua@shou.edu.cn	Toshihide Iwasaki tiwasaki@affrc.go.jp	Seok-Gwan Choi sgchoi@korea.kr Eunjung Kim eunjungkim@korea.kr	Dmitrii Kremenuk d.kremenyuk@fishcom.ru Pavel Afanasyev afanasiev@vniro.ru	Mei-Chin Juan meichin@ms1.fa.gov.tw		**Peter Flewwelling** pflewwelling@npfc.int **Aleksandr Zavolokin** azavolokin@npfc.int
Corresponding Group on Observer Program	Eddy Kennedy Eddy.Kennedy@dfo-mpo.gc.ca	Siquan Tian sqtian@shou.edu.cn	Toshihide Iwasaki tiwasaki@affrc.go.jp	Seok-Gwan Choi sgchoi@korea.kr Jaebong Lee leejb@korea.kr	Dmitrii Kremenuk d.kremenyuk@fishcom.ru Igor Melnikov igor.melnikov@tinro-center.ru	Mei-Chin Juan meichin@ms1.fa.gov.tw		**Aleksandr Zavolokin** azavolokin@npfc.int **Peter Flewwelling** pflewwelling@npfc.int
Joint NPFC-PICES group	Eddy Kennedy Eddy.Kennedy@dfo-mpo.gc.ca	Yong Chen cheny@shou.edu.cn Wei Yu wyu@shou.edu.cn	Toshihide Iwasaki tiwasaki@affrc.go.jp	Seok-Gwan Choi sgchoi@korea.kr Eunjung Kim eunjungkim@korea.kr	Vladimir Kulik vladimir.kulik@tinro-center.ru	Chih-Hao Hsieh chsieh@ntu.edu.tw		Aleksandr Zavolokin azavolokin@npfc.int

SSC – small scientific committee
TWG – Technical Working Group
DCT – data collection templates
Chair/Leader **in bold**.

Annex J

Draft TORs of SSC-VME and SSC-Bottom Fish for the development of technical guidelines that supplement exploratory fishery protocols

a. Develop technical guidelines for preparation and submission of notifications of exploratory fisheries that qualify the information required by Appendix 1.1/Annex 1/ CMM2016-05 and 06

To specify the contents of notification for each gear type.

b. Develop templates for submitting preliminary assessments of the potential for proposed bottom fishing activities to have significant adverse impacts on VMEs

To specify the pre-fishing assessment procedure and requisite information

c. Specify data collection plan and reporting requirement during the course of and after the completion of the proposed exploratory fisheries

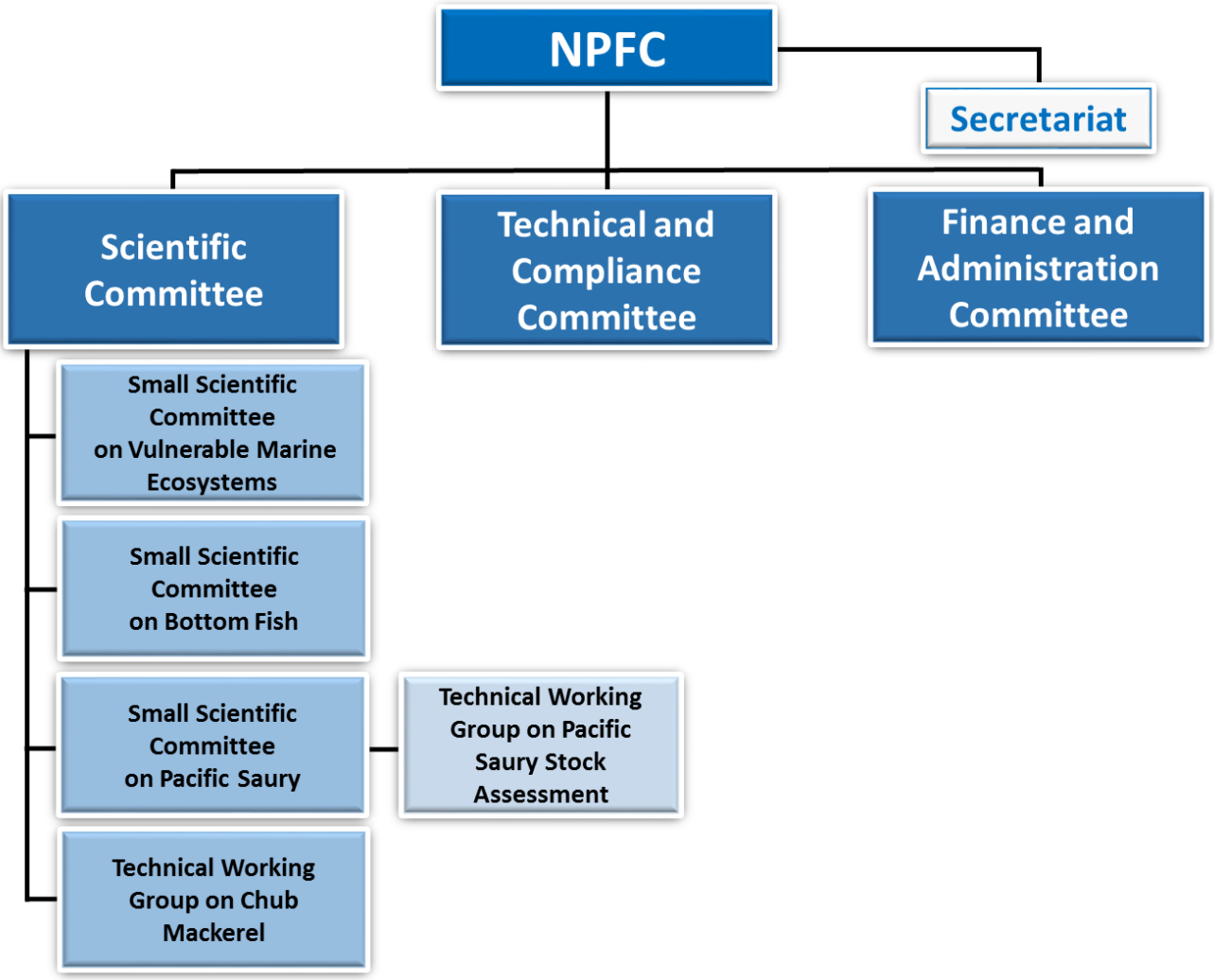
- *Data requirement for gear type unspecified by current CMMs (e.g. crab pot)*
- *Necessity of in/out reports, start/end fishing reports*
- *Necessity of daily/5-day/monthly reports*
- *Requirement for information relevant to bottom fish stocks and bycatch species*

d. Consider procedures to evaluate the impacts of exploratory fishing operations on VMEs (and fish stocks) based on the post-fishing reports.

- *To improve reporting requirements (Appendix 1.2) if it is necessary*

Annex K

North Pacific Fisheries Commission structure for 2017 including proposed revision by the Scientific Committee



Annex L

NPFC Meetings, 2017 – 2018

Meeting	Date	Place	Chair
TCC	10-12 July 2017	Sapporo, Japan	R. Day
FAC	12 July 2017	Sapporo, Japan	?
Commission	13-15 July 2017	Sapporo, Japan	K. Kagawa
TWG CM	4-5 December 2017	Vladivostok, Russia	?
TWG PSSA	6-8 December 2017	Vladivostok, Russia	T. Kitakado
VME Workshop	March 2018	Japan	Co-Chairs L. Low and M. Kiyota
SSCs	April 2018?	?	B. Li/T. Ichii/T. Iwasaki
SC	April 2018?	?	J. Morishita