

North Pacific Fisheries Commission
1st Meeting of the Small Scientific Committee on North Pacific Armorhead

18-19 April 2016
Tokyo, Japan

FINAL REPORT

Agenda Item 1. Opening of Meeting

1. The 1st Meeting of the Small Scientific Committee on North Pacific Armorhead (SSC NPA01) took place in Tokyo, Japan and was attended by Members from China, Japan, Republic of Korea, and the Russian Federation, and a party that has not yet ratified the Convention (United States of America) and observers.
2. There was a one-minute silence in memory of those families affected by the recent earthquakes in southern Japan.

Agenda Item 2. Selection of Chair and Rapporteur

3. Dr. Taro Ichii was selected as the Chair. Mr. Peter Flewwelling was selected as Rapporteur with support provided from Japan.

Agenda Item 3. Adoption of Agenda

4. The provisional agenda was adopted without amendment. The Chair reviewed the indicative schedule and noted his proposed approach for the informal industry-NPFC Participants meeting.

Agenda Item 4. Review of fisheries through presentation of Annual Reports

5. Participants made reports with respect to their bottom fisheries in their Annual Reports with particular reference to North Pacific armorhead (*Pentaceros wheeleri*). Japan, Republic of Korea, and Russian Federation provided short discussions on the highlights of their bottom fisheries referring to NPFC01-2016-AR-Annual Summary Table on Bottom Fisheries. USA noted it has ceased fishing for several years to rebuild the stock in the Emperor Seamounts area. Current experience for 2016 did not show high catches.

Agenda Item 5. Progress in the development of stock assessments and adaptive management approach for North Pacific Armorhead

6. Japan presented NPFC01-2016-SSC-NPA01-WP01. Japan calculated past stock and catch dynamics for NPA, from 2005 – 2015, under management rules of fixed catch limit (CL) and adaptive management (AM) to examine the effectiveness of AM schemes for NPA using the Japanese fishery as an example of the management target. The calculations included revised CL based on stock status within the fishing season. Characteristics of the four management rules tested included:

- Rule 1) Fixed CL 15,000 mt management which proved less effective in stock recovery
- Rule 2) Fixed CL 5,200 mt management which proved less effective in stock recovery and rational use because of over exploitation during low stock level periods and under exploitation in large recruitment years
- Rule 3) AM starting with CL 2,000 mt (revised up to 5,200 or 15,000 mt according to recruitment level – May, June and July) which was effective in both stock recovery and maintaining the harvest rate at moderate levels
- Rule 4) AM with starting CL 15,000 mt which found that delays in CL revision could have large impacts on stock dynamics and harvest rates.

7. Results suggested that:

- a. AM is more effective for increasing and stabilizing NPA stock and catch than fixed CL management,
- b. AM starting with a low CL level is robust over uncertainties in NPA life history and fisheries, and
- c. AM starting with a high CL level is difficult to implement because stock dynamics and harvest rates are highly dependent on the timing of CL revision.

It was noted that there were merits and challenges with each scenario and these were presented to the meeting.

8. Japan presented NPFC01-2016-SSC-NPA01-WP02 which estimated the recruitment period of NPA based on the temporal variation in CPUE and fatness index (FI) from 2010 to 2014. It is noted that CPUE and FI can provide useful inputs to detect timing and level/trend of recruitment. Findings included:

- a. Recruitment of this species probably started in between January and March, because the percentage of higher FI individuals ($FI \geq 0.3$) that represent new recruit increased in these months.
- b. Nominal CPUEs increased between February and April in accordance with the rise of the percentage of higher FI individuals in large recruitment years.

These results suggest the possibility for detection of strong recruitment based on the trends in nominal CPUE from January to April.

9. Generally, Participants noted that NPFC01-2016-SSC-NPA01-WP01 was a good exercise in the development of stock assessments and adaptive management approach for North Pacific Armorhead. It was also noted that in a data poor fishery, such as NPA, many

challenges would arise that could be addressed as more data became available. Some of the challenges raised included: the merits of increasing the number of scenarios; inclusion of biological data as it became available, e.g., recruitment relationship between spawning biomass and stock size; environmental factors; changing harvesting behavior or strategies of fishermen; and determining how to address management issues such as varying control of the opening and closing, or adjustment of the fishery in a multi-national perspective. These issues would be addressed as such data became available to revise the current model.

10. Comments from Participants on NPFC01-2016-SSC-NPA01-WP02 noted the difficulties in comparing CPUE and Fatness Indices; the lack of data since the USA and earlier Japanese studies on the subject which may not have included ecological factors, and the need to update some of the reference studies. It was noted that Japanese scientific observer data are available since 2009 and commercial catch and effort from the 1990s enable further analysis of the proposed model against data from years of high recruitment to test its validity.
11. Japan referenced two information papers: NPFC01-2016-SSC-NPA01-Inf01a,b - History, Biology NPA and NPFC01-2016-SSC-NPA01-Inf02a,b- Prey Use , reprints of journal articles for background information on biology and ecology of NPA.

Agenda Item 6. Collection and integration of data and information from fisheries

12. SSC NPA sought inputs on the collection and integration of data and information from the fisheries into a management scheme, with the following resultant suggestions:
 - a. Investigate other models for the management of NPA, however, in the interim;
 - b. Develop a harvest control rule for the Adaptive Management Strategy for NPA to enable NPFC to set catch limits that reflect changes in recruitment levels each year;
 - c. Such development would require refinement of individual Participant data collection requirements to address simple catch and effort data with an agreement on a standard for a common unit to record effort; and
 - d. Consider methods to ensure enough speed and interval (e.g., every ten days) of reporting required for implementing the Adaptive Management Strategy.
13. An informal meeting was held with fishermen from Japan, scientists and managers to gain further input into the issues noted in paragraph 12. The summary of the informal meeting is attached as Annex D. Key issues raised by industry included:
 - a. Initial catch limit for AM strategy is critical for business planning;
 - b. Mechanism for timely revision of catch limit to catch up with the possible recruitment;
 - c. Equitability of AM scheme across all Members is needed to meet the 'fairness' principle and make the scheme acceptable to industry.

Analysis of past and future data on relationships between NPA recruitment and occurrence of juvenile NPA observed by the neon flying squid fishery would assist in pre-season stock assessments.

Agenda Item 7. Discussion on current Interim Measures and Voluntary Measures for Sustainable Use and Recovery of North Pacific Armorhead

14. The Secretariat, in consultation with Japan, prepared a draft conservation and management measure for the Northwestern Pacific Ocean (NPFC01-2016-SSC-NPA01-WP03a) in an attempt to assist Participants in reviewing current interim and voluntary measures for this area and move them forward towards a more formal management mechanism, a conservation management measure(s) (CMM) for endorsement to the Scientific Committee (SC) and adoption by the Commission, and final submission to the UNGA meeting in November 2016.
15. SSC NPA addressed Paragraph 4 of the proposed CMM focusing on the scientific aspects of the interim measures. The following were proposed under Paragraph 4:
 - a. Paragraph 4 A now read:

Limit fishing effort in bottom fisheries in the western part of the Convention Area to a level agreed in February 2007 in terms of number of fishing vessels and other parameters which reflect the level of fishing effort, fishing capacity or potential impacts on marine ecosystems.
 - b. Para 4 B, C, D, E, and F remain unchanged.
 - c. Para 4 G now read:

C-H seamount is closed for conservation of fish stocks. Part of the southeastern slope of Koko seamount is closed precautionary for potential VME conservation. Fishing in these areas requires exploratory fishery protocol
 - d. Para 4 H remain unchanged.
 - e. Para 4 I now read:

Bottom fisheries closure from November to December.
 - f. Para 4 J remain unchanged.

Agenda 8. Recommendations to 1st Session of the Scientific Committee

16. The SSC NPA recommends the following to SC for endorsement to the 2st Annual Session of the Commission or advice:
 - a. Although NPFC continues to investigate various management strategies, in the interim, SSC NPA recommends it develop the Adaptive Management approach for NPA and refine data collection schemes accordingly;
 - b. Under the Paragraph 4 - Measures of the proposed CMM on Bottom Fisheries – the following paragraphs be changed:
 - i. Paragraph 4 A – Limit Fishing effort in bottom fisheries in the western part of the Convention Area to a level agreed in February 2007 in terms of number of fishing vessels and other parameters which reflect the level of fishing effort, fishing capacity or potential impacts on marine ecosystems.
 - ii. Paragraph 4 G - C-H seamount is closed for conservation of fish stocks. Part of the southeastern slope of Koko seamount is closed precautionary for potential VME conservation. Fishing in these areas requires exploratory fishery protocol

iii. Paragraph 4 I – Bottom fisheries closure from November to December.

All other clauses under paragraph 4 remain unchanged.

17. China suggested that such changes should not be made to the proposed CMM revised from the interim measures until conclusions based on best scientific information available would be reached by consensus.

Agenda 9. Other Matters

18. The Secretariat updated the meeting on the status of the NPFC report to the UN noting that an interim report was forwarded on 2 March for review in August of 2016.

Agenda 10. Next Meeting

19. The venue and timing of the next meeting of SSC NPA is deferred to SC.

Agenda 11. Adoption of the report

20. The Report of the SSC NPA01 was adopted by consensus on 19 April 2016.

Agenda 12. Close of Meeting

21. The meeting closed at 1754 hrs. on 19 April 2016.

22. The Participants thanked the Chair for his leadership and guidance during the meeting.

Annexes

Annex A	Agenda
Annex B	Annotated Agenda
Annex C	Meeting Participants
Annex D	Summary Of The Informal Discussions With Fishers On Adaptive Management And Other Management Strategies For NPA

North Pacific Fisheries Commission

1st Meeting of the Small Scientific Committee on North Pacific Armorhead

**18-19 April 2016
Tokyo, Japan**

AGENDA

1. Opening of the meeting
2. Selection of Chair and Rapporteur
3. Adoption of Agenda
4. Review of fisheries through presentation of Annual Reports
5. Progress in the development of stock assessments and adaptive management approach for North Pacific Armorhead
6. Collection and integration of data and information from fisheries
7. Discussion on current Interim Measures and Voluntary Measures for Sustainable Use and Recovery of North Pacific Armorhead
8. Recommendations to 1st session of the Scientific Committee
9. Other Matters
 - UN Review of Bottom Fisheries
10. Next meeting
11. Adoption of the Report
12. Close of the Meeting

North Pacific Fisheries Commission
1st Meeting of the Small Scientific Committee on North Pacific Armorhead

18-19 April 2016
Tokyo, Japan

ANNOTATED AGENDA

Agenda Item 1. Opening of Meeting

The meeting will open at 0900 hrs on 18 April 2016. Past Chair shall provide admin details for the meeting (start times, breaks, facilities available – washrooms secretariat, etc.)

Agenda Item 2. Selection of Chair and Rapporteur

Participants will consider to select Chair and Rapporteur for the Meeting and future meetings according to the Rules of Procedure.

Agenda Item 3. Adoption of Agenda

The provisional agenda will be reviewed, amended where appropriate, and adopted.

Agenda Item 4. Review of fisheries through presentation of Annual Reports

Members will be asked to update and highlight information regarding bottom fisheries based on their Annual Report submitted to the Secretariat.

Agenda Item 5. Progress in the development of stock assessments and adaptive management approach for North Pacific Armorhead

Participants will be invited to present on the progress of developing stock assessment and adaptive techniques for North Pacific Armorhead since the WG meeting in 2014.

Agenda Item 6. Collection and integration of data and information from fisheries

In order to improve stock assessment procedures for bottom fish stocks, SWG recognized that there is a need to improve reporting and information collection regarding all fisheries. Participants will discuss ways to improve reporting and collection from fisheries.

Agenda Item 7. Discussion on current Interim Measures and Voluntary Measures for Sustainable Use and Recovery of North Pacific Armorhead

Participants will be invited to discuss current interim and voluntary measures for North Pacific armorhead with a view to refine them to make formal NPFC conservation and management measures which will be considered by the Scientific Committee and the Commission with the final intent being to submit these CMMs as an information paper to the UN Deep Sea Fisheries Review scheduled in November 2016.

Agenda Item 8. Recommendations to 1st session of the Scientific Committee

Participants will agree on recommendations to be submitted to 1st session of the Scientific Committee for its consideration.

Agenda Item 9. Other Matters

- UN Review of Bottom Fisheries

Participants will discuss how to prepare UN Review of Bottom Fisheries and also consider any other issues that are raised under agenda item 3.

Agenda Item 10. Next meeting

Participants will decide the date and place of the next meeting.

Agenda Item 11. Adoption of the Report

The record of the 1st SSC on North Pacific armorhead will be adopted.

Agenda Item 12. Close of Meeting

The meeting will close at 1800 hrs on 19 April 2016.

* An informal meeting between scientists, managers and industry to discuss management measures for North Pacific armorhead will take place in the morning of 19 April 2016.

**NORTH PACIFIC FISHERIES COMMISSION
SMALL SCIENTIFIC COMMITTEE –
NORTH PACIFIC ARMORHEAD MEETING
18-19 April 2016**

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SUMMARY OF THE INFORMAL DISCUSSIONS WITH FISHERS ON ADAPTIVE MANAGEMENT AND OTHER MANAGEMENT STRATEGIES FOR NPA

An informal meeting was held with scientist, managers and Japanese fishermen on 19 April 2016 to exchange information and views about the management of NPA with particular reference to the adaptive management (AM) strategy. Main points of the discussion are summarized below. It should be noted that this summary does not reflect the opinion of all Members and Parties, but represents personal views of the participants.

1. Points raised by Fishermen on the management of NPA

a. General views on fishery management

Fishermen expressed their willingness to have an appropriate stock management regime that will ensure long-term sustainable use of fish stocks in the Emperor Seamounts area. They noted such management regime should be based upon the common understanding of the shared utilization of fish stocks among multiple fleets and fishing parties.

Fishermen raised important elements for the management of fishery and fish stocks:

- Incorporation and reflection of the opinions of fisherman in management.
- Transparency and equitability of fishery management among fishing fleets and Parties;
- Consideration of sustainability of fishery that ensure economic profitability.
- Freezing of the number of fishing vessels as noted in the interim measures until the NPA stock is rebuilt.
- Consideration of other factors that may cause the decline of the NPA stock besides overexploitation by fishery (e.g., environmental change).

b. Comments on adaptive management

Fishermen generally showed positive views for the consideration of AM, but they also expressed concern about catch level (CL) setting, timing and procedures for CL revision, and impacts on economic aspects of the industry.

- The starting level of CL and its revision protocols have the greatest impacts on fishing operations. Notification of the initial CL gives fishermen the opportunity to prepare.
- The CL should be large enough to ensure the profitability of individual fishing vessels. In this respect, an AM rule starting with medium CL level may be helpful to fishers.
- Measures to allocate the CL to individual vessels should be considered for preventing excessive competition among fishers.
- Early determination and notification of the initial CL gives opportunities for the fishing industry to construct business plans for maximizing market values of the NPA products.
- Revision of the CL needs to be conducted rapidly to minimize the delay and waste of time in fishing operations in years with large recruitment.

Pros and cons and concerns about the four examples of fixed CL and AM rules were summarized in Table 1 from the perspective of scientists. This table was distributed to Participants.

c. Questions and comments on the biology of NPA

Based on their experience at sea, fishermen provided several questions and comments on the biology of NPA.

- Fishermen suggested the possible relationship between the observation of juvenile NPA aggregating to electric lights of neon flying squid jigging vessels in the western North Pacific in summer and subsequent large recruitment two years after the observation. Scientists discussed about the possibility of pre-season assessment of NPA recruitment size including acoustic surveys and analyses of past and future data collected by squid fisheries.
- Fishermen asked a question about the relationship between NPA recruitment and oceanic environment and the possibility of recruitment prediction in the future. Scientists explained the difficulty in predicting recruitment levels based upon the spawning stock biomass and the available oceanographic data although some studies have suggested the possible relationship between NPA recruitment and environmental index such as PDO (Pacific Decadal Oscillation).
- Fishermen also asked about the target level of the biomass of spawners under AM strategy for NPA. A scientist noted the difficulty in setting the target level of the biomass of spawners as a management objective for rebuilding the NPA stock, albeit setting of the management objective among stakeholders is the key component of the AM that implement a recursive “Plan-Do-Monitoring” cycle in course of the fishing operations.

2. Comments raised by managers:

- AM should be adopted by NPFC and thus applied to all NPFC members.
- Assuming TAC revision procedure follows analyzing catch data in the beginning of the season and issue the revised TAC according to an adopted rule, one concern is that normal NPFC reporting and decision making procedures (e.g. reporting to SC and the SC sends its agreed recommendation to the Commission for its decision) may not quick enough to action the revision during the same season. It would be necessary to develop a new decision mechanism. One idea would be to give authorization to issue the revised TAC to the Executive Secretary.

Table 1. Pros and cons and concerns about the four examples of fixed CL and AM rules from the perspectives of scientists

Comparative table of management rules about NPA ² From SSC-NPA01 WP01/J					
Management rules	Stock recovery	Catch control (harvest rate)	Merit/demerit	From fisherman	From manager
<Rule 1> Fixed CL: 15000 mt	Less effective	Overexploitation during low stock level periods			
<Rule 2> Fixed CL: 5200 mt	Less effective	Overexploitation during low stock level periods	Low harvest level in sporadic recruitment year spoil the profit of fisherman		
<Rule 3> AM starting with low CL Revised CL up to middle/high level	Effective (Especially with SRR)	Maintain the harvest rate at moderate levels Reduce the risk of extreme poor catch in low stock level	Little influences of CL revision timing on stock and catch dynamics		
<Rule 4> AM starting with high CL Revised CL down to low /middle level	If the CL is revised in May, stock recovery could be expected similar to rule 3	High harvest rates increase catch amounts Overexploitation during low stock level periods	Delay of CL revision has large impacts on stock dynamics and harvest rates; especially CL revision in July is similar to the rule 1		

AM starting with low level CL is more effective to recover the NPA stock and to increase and stabilize the commercial catch than other managements