



North Pacific Fisheries Commission

NPFC-2022-SWG MSE PS02-Final Report

**2nd Meeting of the Joint SC-TCC-COM Small Working Group on
Management Strategy Evaluation for Pacific Saury (SWG MSE PS)
REPORT**

12 - 13 September 2022

October 2022

This paper may be cited in the following manner:

Small Working Group on Management Strategy Evaluation for Pacific Saury. 2022. 2nd Meeting Report. NPFC-2022-SWG MSE PS02-Final Report. 18 pp. (Available at www.npfc.int)

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WebEx

REPORT

Agenda Item 1. Introductory items

1.1 Opening of the meeting

1. The 2nd meeting of the joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific Saury (SWG MSE PS) took place in the format of video conferencing via WebEx, and was attended by Members from Canada, China, Japan, the Republic of Korea, the Russian Federation, Chinese Taipei, and Vanuatu. The Pew Charitable Trusts (Pew) attended as an observer. Dr. Larry Jacobson participated as an invited expert. The meeting was chaired by Dr. Toshihide Kitakado (Japan) who is the co-Chair of the SWG MSE PS. Dr. Kitakado opened the meeting and welcomed the participants.

1.2 Adoption of agenda

2. The agenda was adopted without revision (Annex A). The List of Documents and List of Participants are attached (Annexes B, C).

1.3 Meeting logistics

3. The Science Manager, Dr. Aleksandr Zavolokin, outlined the meeting arrangements.
4. Mr. Alex Meyer was selected as rapporteur.

Agenda Item 2. Overview of the outcomes of previous NPFC meetings

2.1 SWG MSE PS01

5. The Chair presented the outcomes and recommendations from the SWG MSE PS01 meeting (NPFC-2022-SWG MSE PS02-IP01).

2.2 SSC PS09

6. The Chair presented the outcomes and recommendations from the 1st Intersessional Meeting of

the Small Scientific Committee on Pacific Saury (SSC PSint01; NPFC-2022-SWG MSE PS02-WP01) and the 9th Meeting of the Small Scientific Committee on Pacific Saury (SSC PS09).

Agenda Item 3. Development of an interim harvest control rule (HCR) as a short-term task

7. The SWG MSE PS noted that the provisions of Article 3(b) and 3(c) of the Convention and paragraph 7, Annex II, of the 1995 United Nations Fish Stock Agreement provide a framework for discussions of the HCR and MSE, specifically that management measures shall ensure that fisheries resources are maintained at or restored to levels capable of producing maximum sustainable yield (MSY), that measures shall be based on a precautionary approach, and that the fishing mortality rate which generates MSY should be regarded as a minimum standard for limit reference points.

3.1 Management objectives

8. The SWG MSE PS reviewed the three types of management objective discussed at SWG MSE PS01: recovery of the stock, avoiding unsustainable state of the stock, and achieving high and stable catch. The SWG MSE PS agreed to continue to base discussions around these three objectives below, putting higher priority on (a);
 - (a) Recovery of the stock:
 - i. The stock status is recovered above B_{tar} within “xx” years with “pp” probability (for example, xx could be 2-5 and pp could be >80%);
 - ii. The stock status is maintained above the B_{tar} level over “yy-yy” years with “qq” probability.
 - (b) Avoiding unsustainable state of the stock:
 - i. The annual probability that the stock drops below B_{lim} should not exceed “pp” probability;
 - ii. The annual probability that the fishing mortality exceeds F_{lim} should not exceed “pp” probability.
 - (c) Achieving high and stable catch:
 - i. Catch is high and stable as much as possible;
 - ii. Maximum interannual variation of TAC over yy period should be less than xx%.

3.2 Reference points and tuning criteria

9. The SWG MSE PS considered the list of preliminary reference points discussed at the SSC PSint01 and developed it further, as shown below. The SWG MSE PS agreed that the list of ranges for biological reference points contains typical values but is purposely wide for computational, discussion and exploratory purposes. The default values are for demonstration purposes. Neither implies any advice or decision about recommended harvest guidelines for

Pacific saury.

Reference point	Default value	Potential range
$B_{tar} = c * B_{MSY}$	$c = 1$	$c = 0.8 - 1.2$
$B_{lim} = c * B_{MSY}$	$c = 0.35$	$c = 0.2 - 0.5$
$F_{tar} = c * F_{MSY}$	$c = 1$	$c = 0.8 - 1.2$
$F_{lim} = c * F_{MSY}$	$c = 1.35$	$c = 1.2 - 1.5$

3.3 Conditioning of operating models (OMs)

10. The SWG MSE PS noted the previous discussions on the conditioning of OMs in the SWG MSE PS01 and the SSC PSint01 and agreed to continue this work.

3.4 Listing up possible/candidate HCRs and constraints therein

11. The SWG MSE PS considered the three HCR options discussed at the SSC PSint01 and developed them further, together with implementation schedules, as described in Annex D. The SWG MSE PS agreed to continue to develop the HCR options, while indicating initial preference for Option 2.

12. Two of the HCR options (Options 2 and 3) would allow for the adjustment of the total allowable catch (TAC) based on the stock assessment result one year ago during the fishing season. The SWG MSE PS noted that being able to make such an adjustment is important in light of the biological characteristics of Pacific saury, namely its short lifespan and interannual fluctuation in recruitment strength. At the same time, the SWG MSE PS noted that a mid-season TAC adjustment could be challenging for managers and industry, and that various options, such as constraints on the level of adjustment or limiting the making of adjustments only to exceptional circumstances, should be considered. The SWG MSE PS noted that it is essential for such discussions to be held among scientists and managers, and encouraged both Member scientists and managers to attend future meetings.

3.5 Performance measures

13. The SWG MSE PS reviewed the performance measures discussed at the SWG MSE PS01 and agreed to continue to base discussions around them. The possible performance measures reflecting the management objectives are as follows:
 - (a) Recovery of the stock:
 - i. Probabilities that the stock status is above B_{tar} at 1, 2, ..., 5, 10, 15 years after the HCR is implemented;
 - ii. Probabilities that the stock status is in Kobe green quadrant at 5, 10, 15 years after the

HCR is implemented.

(b) Avoiding unsustainable state of the stock:

- i. Probabilities that the stock status is below B_{lim} at 1, 2, ..., 5, 10, 15 years after the HCR is implemented;
- ii. Probabilities that the fishing mortality exceeds F_{lim} at 1, 2, ..., 5, 10, 15 years after the HCR is implemented.

(c) Achieving high and stable catch:

- i. Average catch by 1-5, 6-10, 11-15 years after the HCR is implemented;
- ii. Annual catch variation by 5, 10, 15 years after the HCR is implemented;
- iii. Probabilities that the TAC hits the predetermined maximum change by 5, 10, 15 years after the HCR is implemented.

3.6 Simulation platform

14. The SWG MSE PS reaffirmed the usefulness of the Shiny application and recommended that the Commission ensure the adequate allocation of funds, as soon as possible, for the development of a simulation platform for the evaluation of HCR. Funding for support of HCR analyses by the SSC PS may be required as well.

15. The SWG MSE PS noted that the seasonal pattern of catches should be considered in testing potential adjustments to quotas in year t set in year $t-1$. Under Option 2, survey and preliminary CPUE data for year t would become available for use in adjustments at the first assessment meeting in August when the survey data become available. This implies that managers might adjust the TAC in late August or early September. A cursory examination showed that seasonal patterns in catch vary between Members and years. The fraction of total seasonal catch by August or September may be considerable in some years, limiting the Commission's ability to reduce catch in some cases. There are three technical points to note with respect to seasonal catch patterns in HCR simulation analyses under Option 2:

- (a) Seasonal catch patterns may generally affect the efficacy of adjustment procedures.
- (b) Efficacy may vary from year to year.
- (c) If seasonal patterns are deemed important, they might be simulated based on observed patterns and able to account for possible implementation errors.

3.7 Template for presentation of results

16. The SWG MSE PS agreed to defer the development of a template for the presentation of results to its next meeting.

3.8 Other matters

17. No other matters were discussed.

Agenda Item 4. Initial discussion toward development of management procedures (MPs) for the mid-term goal

4.1 Management objectives and some constraint conditions for the regulation of fishery

18. The SWG MSE PS agreed to focus on its short-term goal until sufficient progress is made and to defer discussions on its mid-term goal.

19. The SWG MSE PS noted that efforts should be made to ensure as smooth a transition as possible from the short-term goal when setting the HCR to the mid-term goal when developing the MPs.

20. The SWG MSE PS noted Pew's suggestion that the NPFC should work toward establishing an MSE process based on an ecosystem framework that takes into account environmental factors.

4.2 Technical matters on operating models, MPs, performance measures and simulation

21. The SWG MSE PS reaffirmed that it will continue to work to develop an age-structured stock assessment model, without going into technical details.

Agenda Item 5. Implementation schedule and safeguard for exceptional circumstances

5.1 Implementation schedule of an HCR

22. The implementation schedules for the three HCR options are described in Annex D.

23. The SWG MSE PS agreed to analyze a relatively limited range of simple HCRs used in other fisheries. These approaches use an F_{MSY} proxy applied at high biomass levels and a single $B_{threshold}$ value to reduce F as biomass approaches zero. The F_{MSY} proxy approach reduces the need for difficult policy decisions because it is generally recognized that healthy stocks can be fished at maximum sustainable levels, particularly if F is reduced as biomass declines to relatively low levels. The Commission's decision regarding $B_{threshold}$ levels must be based on policy and scientific considerations including simulation results. However, the analyses and range of options considered can be guided and reduced using precedents in other fisheries. This approach recognizes the need to implement an improved approach for Pacific saury in the near term (1-2 years) and it will be possible to improve it later. A simple approach is expected to perform relatively well.

24. The SWG MSE PS agreed that the short 2-year lifespan of Pacific saury and the assessment cycle with one-year delay are expected to reduce HCR performance. To overcome this point,

the SWG MSE PS considered Options 2 & 3, which could modify the quota in year t (originally set in year t-1) with survey and preliminary data from the current year. This is an important but potentially difficult task complicated by scientific and management cycles, and data availability. Nevertheless, the SWG MSE PS agreed to concurrently estimate the potential performance gains from in-season adjustments under Options 2 and 3 and provide concrete proposals. Meanwhile, the SWG MSE PS will also consider the administrative and procedural requirements for in-season adjustments.

25. The SWG MSE PS requested the SSC PS to conduct the technical work in relation to developing the HCR and MPs.

5.2 Mid-term plan of implementation and its review process

26. The SWG MSE PS noted that normally after the completion of HCR and MPs, reviews are conducted within the timeframe of two to three years, but considering the nature of Pacific saury, regular review might be warranted at the beginning of this time period.

5.3 Definition of exceptional circumstances

27. The SWG MSE PS noted that exceptional circumstances can be the population dynamics falling beyond the range of the confidence interval and the unavailability of fisheries independent surveys.

28. The SWG MSE PS noted that the finalized HCR should include definitions of exceptional circumstances.

Agenda Item 6. Other matters

6.1 Capacity building

29. The SWG MSE PS agreed to defer discussions on capacity building to its next meeting.
30. The SWG MSE PS suggested that being able to hold in-person meetings would facilitate more effective hands-on capacity building.

6.2 Others

31. No other matters were discussed.

Agenda Item 7. Timeline and future process

7.1 Timeline

32. The SWG MSE PS reviewed and revised the timeframe agreed to at SWG MSE PS01 (Annex

F).

7.2 Future process with assistance of SSC PS

7.3 Workplan till SWG MSE PS03 meeting

33. The SWG MSE PS recommended that its next meeting be held in person, if possible, and be funded by the Commission if needed.

Agenda Item 8. Recommendations to the Commission

34. The SWG MSE PS02 recommends that:

- (a) the Commission ensure the adequate allocation of funds for the development and utilization of a simulation platform for the evaluation of HCR.
- (b) the next SWG MSE PS meeting be held in person, back-to-back with the annual Commission meeting, and be funded by the Commission if needed.
- (c) the Commission endorse the timeframe for 2024 including the proposed meetings and tasks (Annex F).

35. The SWG MSE PS requested the Secretariat to include the above funding requests in the revised 2022 budget for presentation at the Special Commission meeting on 18 October 2022.

36. The SWG MSE PS agreed that future meetings should include both scientists and managers to facilitate communication and completion of this important work.

Agenda Item 9. Adoption of report

37. The SWG MSE PS02 Report was adopted by consensus.

Agenda Item 10. Close of the Meeting

38. The meeting closed at 12:55 on 13 September 2022, Tokyo time.

Annex A – Agenda

Annex B – List of documents

Annex C – List of participants

Annex D – Proposed options of Harvest Control Rules

Annex E – Timeframe of NPFC meetings toward setting a Harvest Control Rule

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- 4.2 Technical matters on operating models, MPs, performance measures and simulation

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- 7.1 Timeline

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Agenda Item 8. Recommendations to the Commission

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List of Documents

MEETING INFORMATION PAPERS

Symbol	Title
NPFC-2022-SSC PS09-MIP01	Meeting Information
NPFC-2022-SWG MSE PS02-MIP02	Provisional Agenda
NPFC-2022-SWG MSE PS02-MIP03 (Rev. 1)	Annotated Indicative Schedule

REFERENCE DOCUMENTS

Symbol	Title
NPFC-2022-SSC PS09-Report	Draft report of SSC PS09
NPFC-2022-SWG MSE PS01-Final Report	1st Meeting of the Joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific Saury (SWG MSE PS) Report

WORKING PAPERS

Symbol	Title
NPFC-2022-SWG MSE PS01-WP01	Meeting Summary of the 1st intersessional meeting of the SSC PS in 2022

INFORMATION PAPERS

Symbol	Title
NPFC-2022-SWG MSE PS02-IP01	Co-Chair's presentation from SWG MSE PS01

List of Participants

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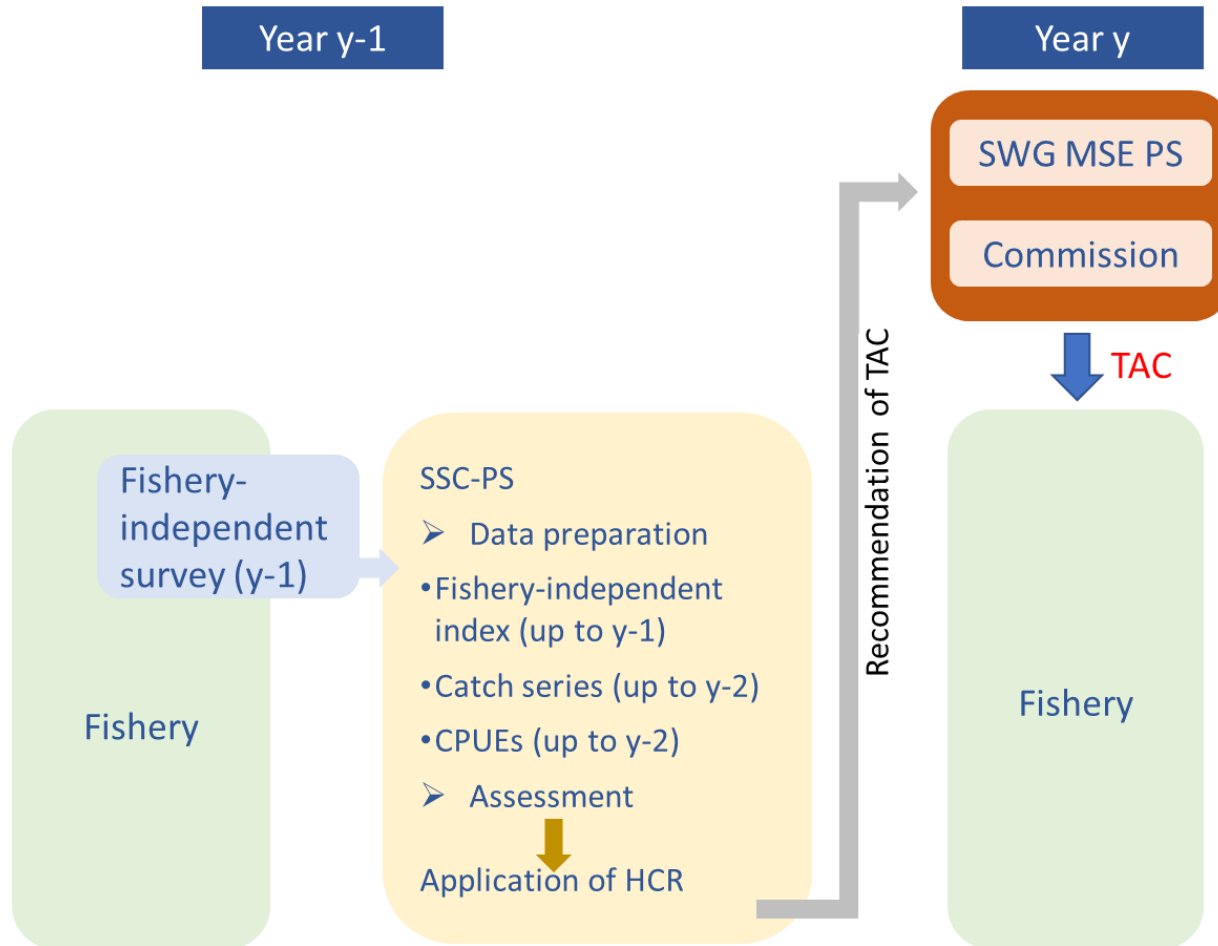
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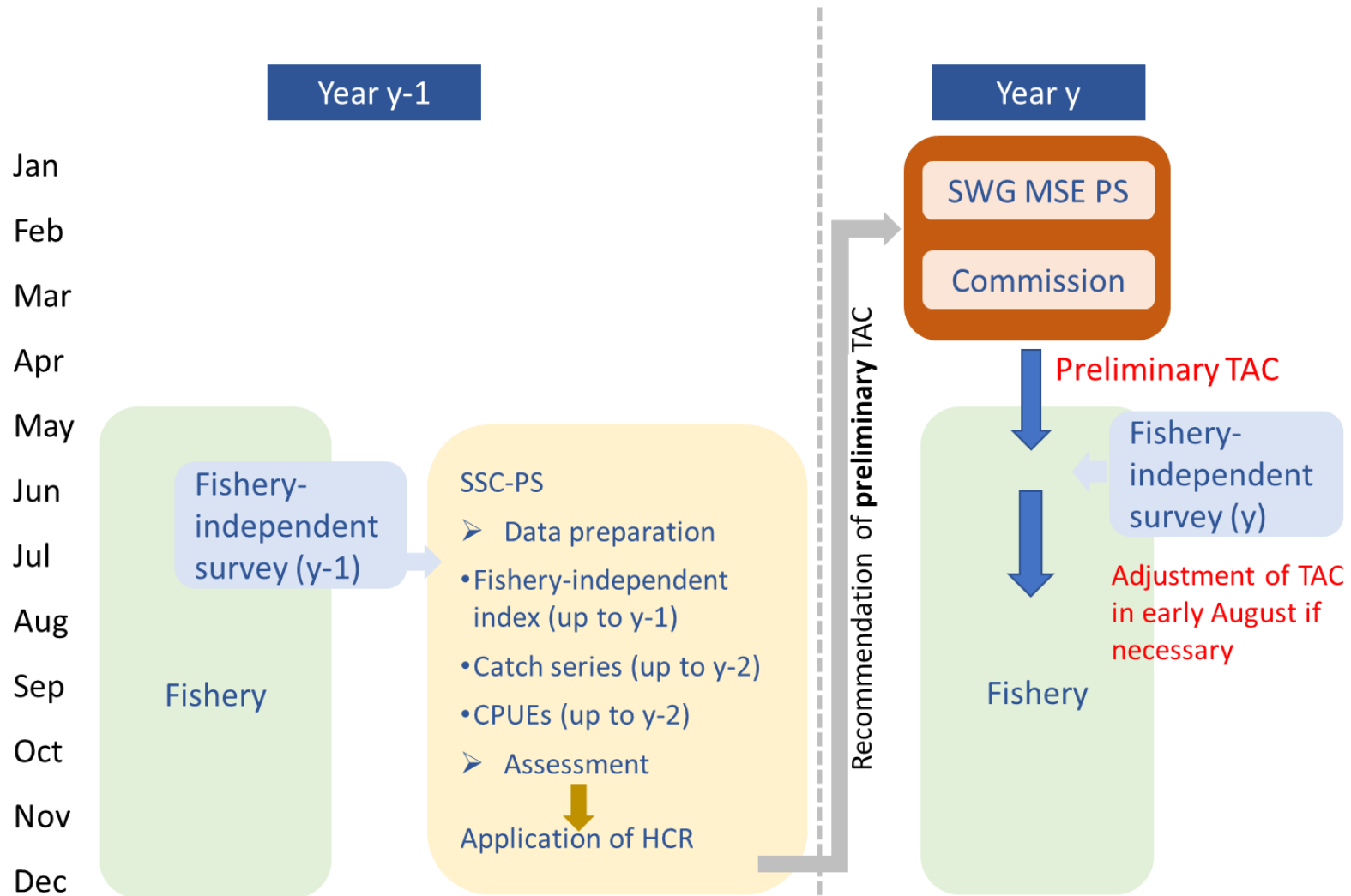
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Proposed options of Harvest Control Rules

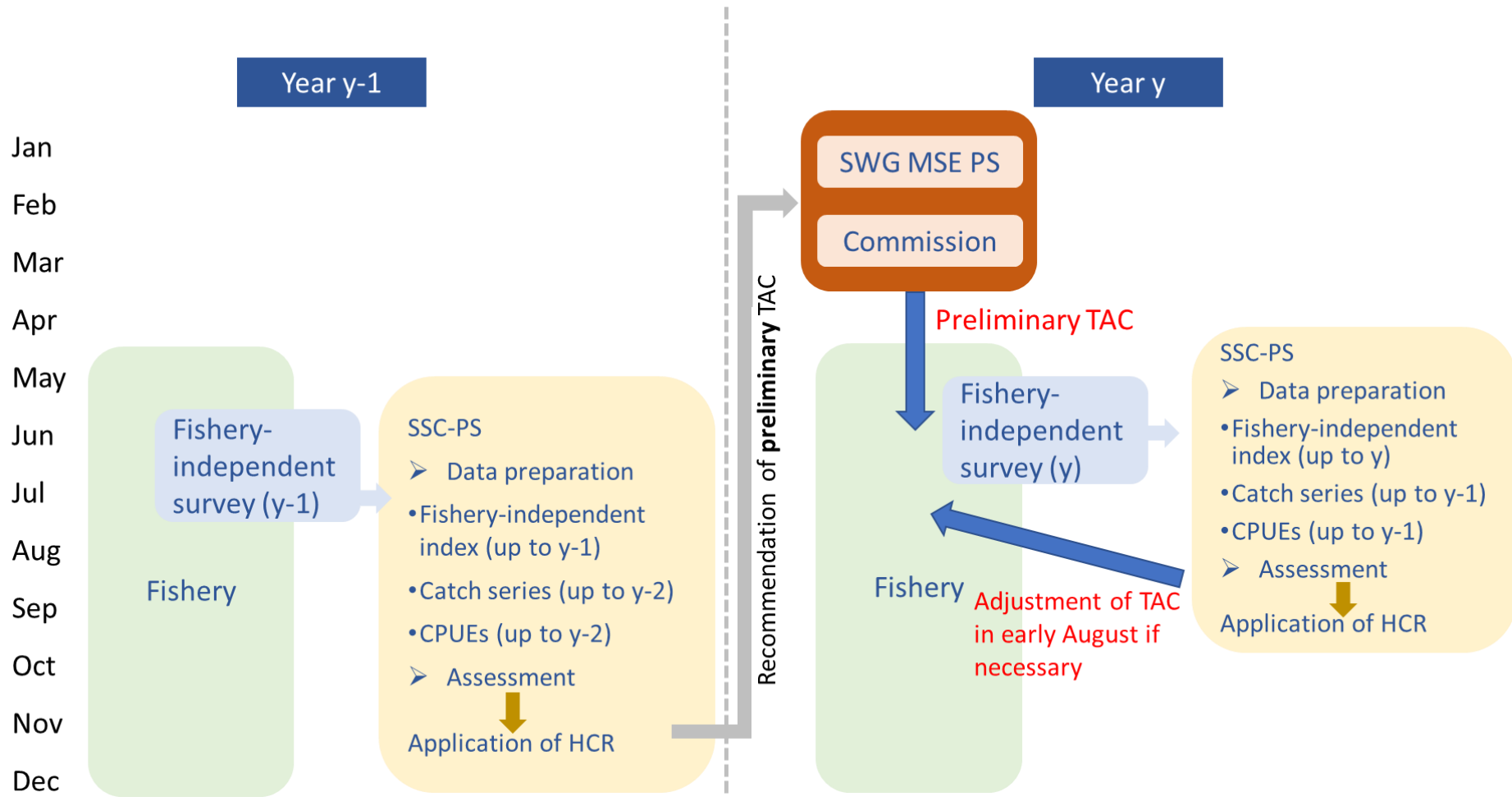
HCR1 (setting TAC based on previous year's assessment)



HCR2 (Hybrid approach with new index)

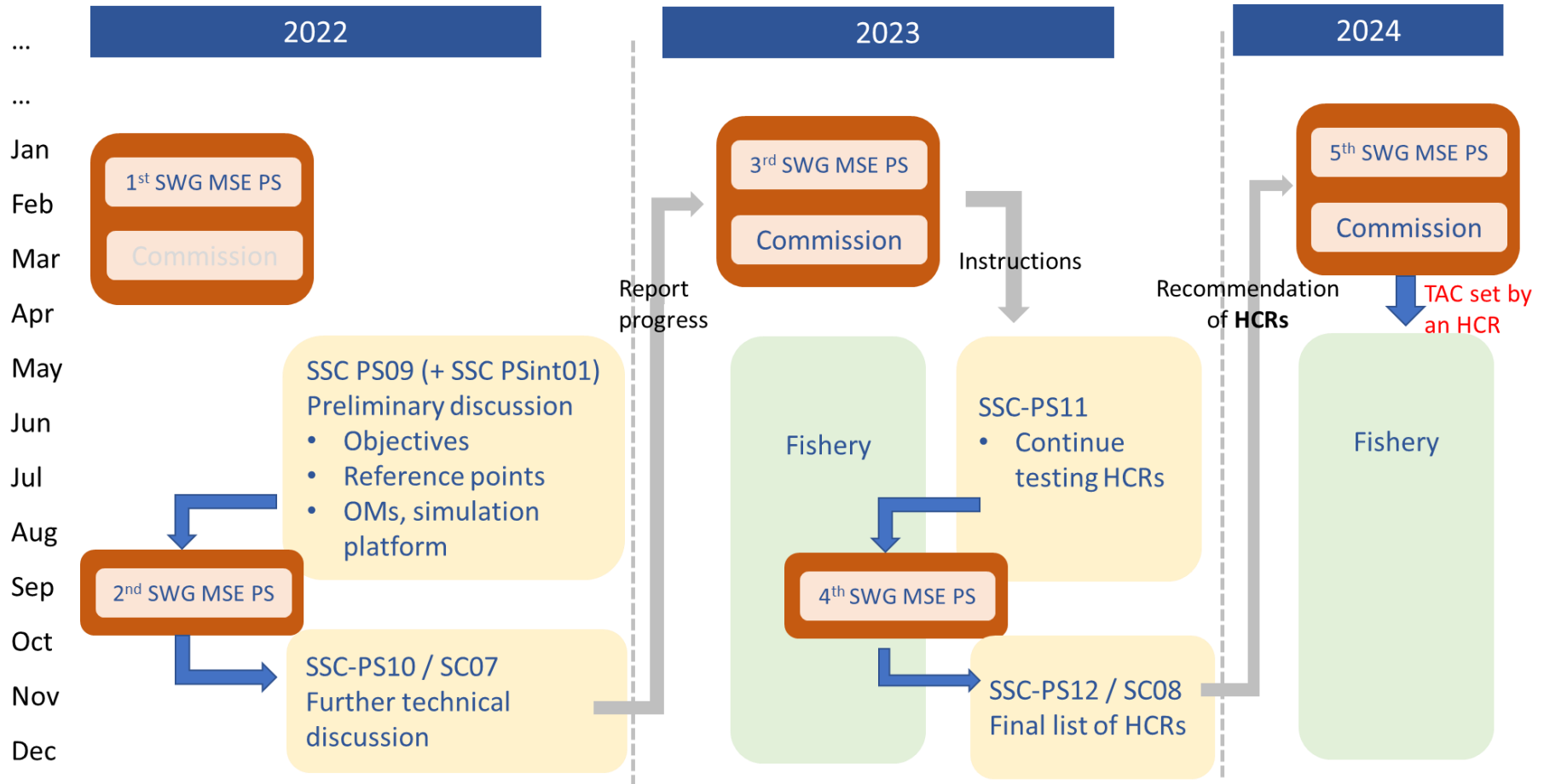


HCR3 (Hybrid approach with new assessment)



Timeframe of NPFC meetings toward setting a Harvest Control Rule

Implementation schedule



Timeline and tasks

Meeting	Date	Task
SWG MSE PS01	Feb 21-22, 2022	<ul style="list-style-type: none"> Objectives, timeline and workplan Establishment of a (small) Task Force for technical works?
COM07 (postponed)	(Mar 28-30, 2022)	<ul style="list-style-type: none"> Review of management advice from SC Review and endorsement of SWG MSE PS01 report
Intersessional technical work		<ul style="list-style-type: none"> Develop concrete proposal of reference points and management objectives Start technical work for developing and evaluating HCRs as a short-term task (conditioning of OMs and list up possible/candidate HCRs)
SSC PS09	Aug 30-Sep 2, 2022	<ul style="list-style-type: none"> Review standardized CPUE up to 2021 Review Japanese survey estimates incl. 2022 Review progress on new assessment models and finalize a set of models and specification Start discussion on development and evaluation of HCR as a short-term task
SWG MSE PS02	Sep 12-13, 2022	<ul style="list-style-type: none"> Feedback on outcomes of intersessional work Capacity building
Intersessional technical work		<ul style="list-style-type: none"> Continue discussions on “reference points and management objectives” and technical work for developing and evaluating HCRs as a short-term task
SSC PS10	Dec 12-15, 2022	<ul style="list-style-type: none"> Update BSSPM analyses and provide recommendations to the SC/COM Review progress on new assessment models and finalize a set of models and specification (relevant to the mid-term MSE work as conditioning of operating models) Continue discussion on development and evaluation of HCR as a short-term task
SWG MSE PS03	Prior to COM08	<ul style="list-style-type: none"> Objectives, reference points, timeline and workplan Continue discussion and dialogue between managers, scientists and stakeholders Provide feedback to SSC PS
COM07	2023	<ul style="list-style-type: none"> Review of management advice from SC Review and endorsement of SWG MSE PS 02 and 03 reports
To be determined	2023	