North Pacific Fisheries Commission

Item 2.1 Overview of the outcomes of SWG MSE PS06

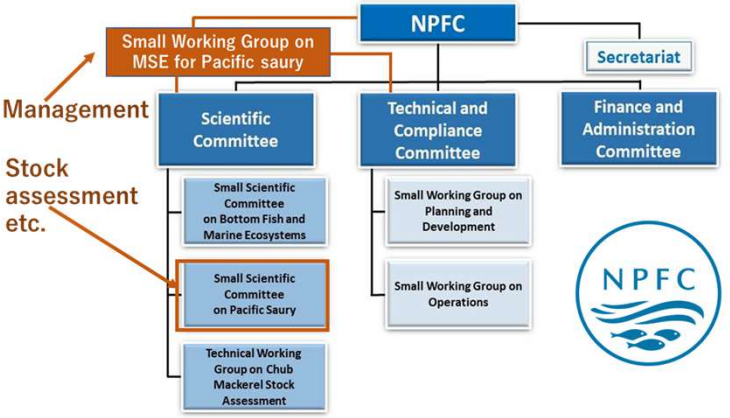
Co-chairs: Derek Mahoney (Canada) and Toshihide Kitakado (Japan)

Objectives stipulated in ToR of SWG MSE PS

Short-Term Objectives: within one to two years (completed in April 2024) :

a) **develop draft interim management objectives** and a **draft interim harvest control rule (HCR)** that meets such objectives to report to the Commission (preferably before the 8th Commission annual meeting); and

b) **evaluate the robustness of the draft interim harvest control rule** with consideration of possible uncertainties including effects of climate changes.



Mid-Term Objectives: within three to five years:

a) develop **draft mid- to long-term management objectives** by setting the **target and limit reference points** for the population status as well as by defining “overfishing” and “overfished” for the sustainable use of the Pacific saury stock;

b) assess the feasibility of establishing a **management procedure through an MSE**

SWG MSE PS 06 (13-14 February 2025 @Remote)

[43 participants] (NPFC-2025-SWG MSE PS 06 – Report)

Agenda Item 1. Introductory items
- 1.1 Opening of the meeting
- 1.2 Adoption of agenda
- 1.3 Meeting logistics

Agenda Item 2. Overview of the outcomes of previous NPFC meetings
- 2.1 SWG MSE PS05
- 2.2 COM08
- 2.3 SSC PS13 and 14

Agenda Item 3. Overview of MSE
- 3.1 Roles of SWG MSE PS in the NPFC process
- 3.2 Basic principles of MSE

Agenda Item 4. Review of results of the adopted HCR
- 4.1 TAC for 2024
- 4.2 HCR-generated TAC for 2025

Agenda Item 5. Discussion toward development of management procedures (MPs) as a mid-term goal
- 5.1 Management objectives
- 5.2 Operating models
- 5.3 Management procedures
- 5.4 Performance indicators

Agenda Item 6. Other matters

Agenda Item 7. Timeline and future process
- 7.1 Timeline
- 7.2 Future process with assistance of SSC PS
- 7.3 Workplan till SSC PS15&16 and SWG MSE PS07 meetings

Agenda Item 8. Recommendations to the Commission

Agenda Item 9. Adoption of report

Agenda Item 10. Close of the meeting

AGENDA ITEM 4. REVIEW OF RESULTS OF THE ADOPTED HCR

4.1 TAC FOR 2024
4.2 HCR-GENERATED TAC FOR 2025

CMM 2024-08

NPFC

North Pacific Fisheries Commission

CMM 2024-08

(Entered into force 15 May 2024)

CONSERVATION AND MANAGEMENT MEASURE FOR PACIFIC SAURY

The North Pacific Fisheries Commission (NPFC),

Reaffirming the General Principles, Article 3 of the Convention, in particular, paragraph (b) stipulating that measures are adopted, based on the best scientific information available, to ensure that fisheries resources are maintained at or restored to levels capable of producing maximum sustainable yield, and paragraph (f) stipulating that preventing or eliminating overfishing and excess fishing capacity and ensuring that levels of fishing effort or harvest levels are based on the best scientific information available and do not exceed those commensurate with the sustainable use of the fisheries resources;

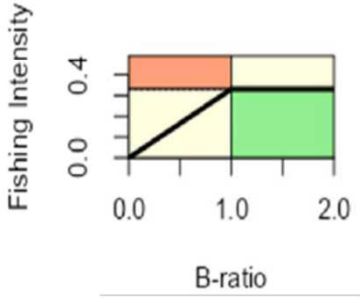


Figure 1. Illustration of the interim HCR.

CATCH MANAGEMENT

5. The interim harvest control rule (HCR) for Pacific saury is as attached in Annex I.

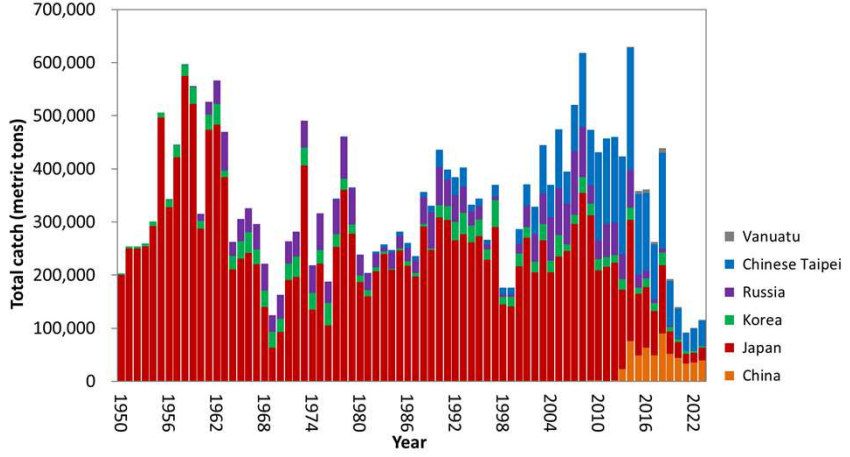
6. The interim HCR is applied until the establishment of a management procedure to be recommended through an MSE process by the Joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific Saury (SWG MSE PS), or unless otherwise decided by the Commission. The SWG MSE PS and the SC shall review the performance of the interim HCR every year based on the best scientific information available, particularly the latest stock assessment results, and provide a recommendation for the Commission, as necessary.

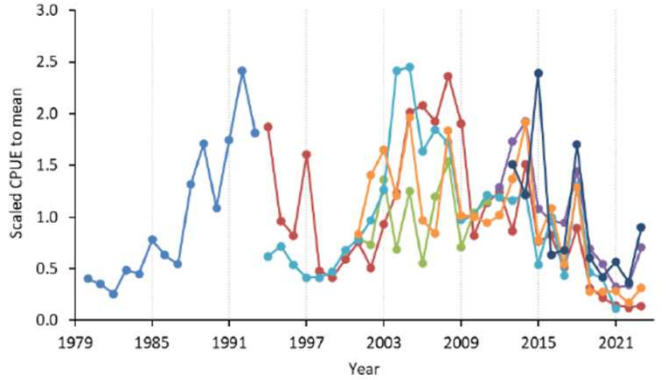
7. For 2024, Members of the Commission agreed that the annual catch of Pacific saury in the entire area (the Convention Area and the areas under their jurisdiction adjacent to the Convention Area) should not exceed 225,000 metric tons, as calculated using the interim HCR in Annex I.

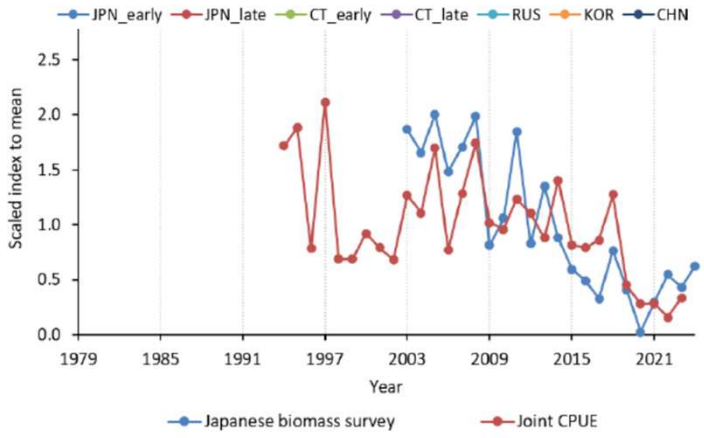
8. In 2024, the annual total allowable catch (TAC) of Pacific saury in the Convention Area shall be limited to 135,000 metric tons.

Data set used in 2024 assessment (updated in SSC13, Aug 2024)

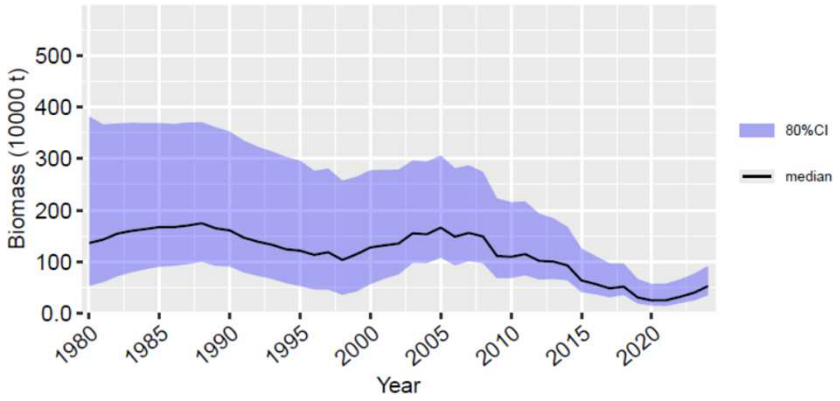
- Time series of total catch
- Time series of fishery-independent abundance index
- Time series of fishery-dependent abundance indices
  - Each member's CPUE
  - Joint CPUE

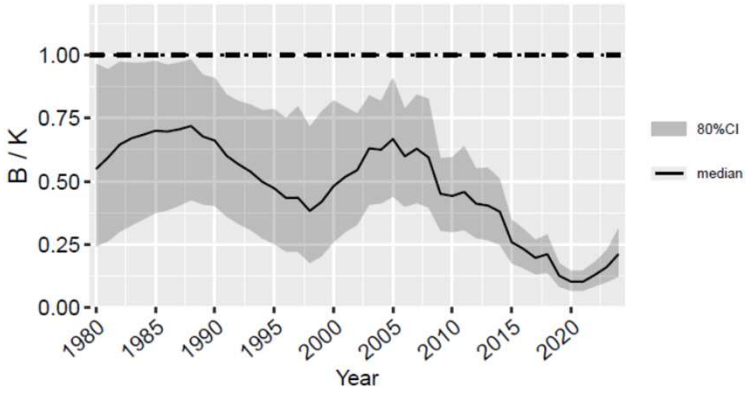


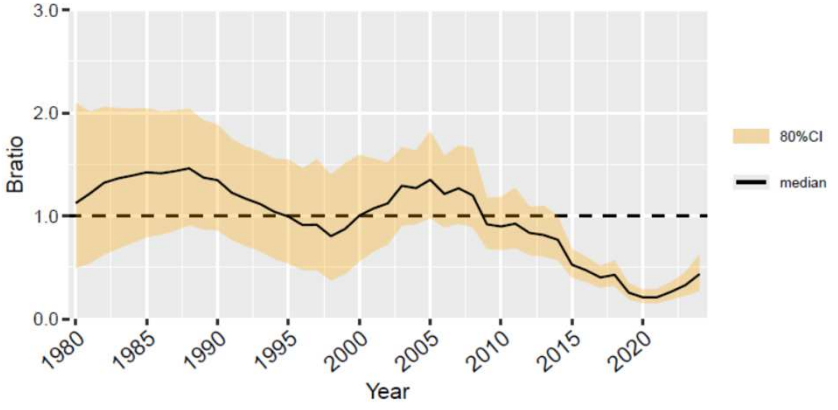


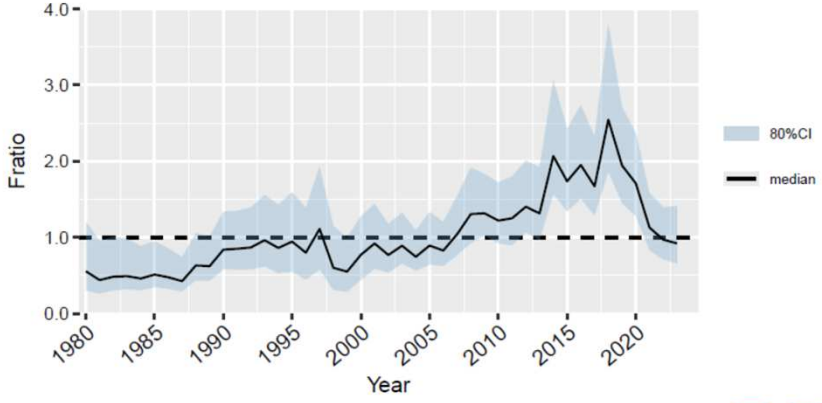


Combined and separate results



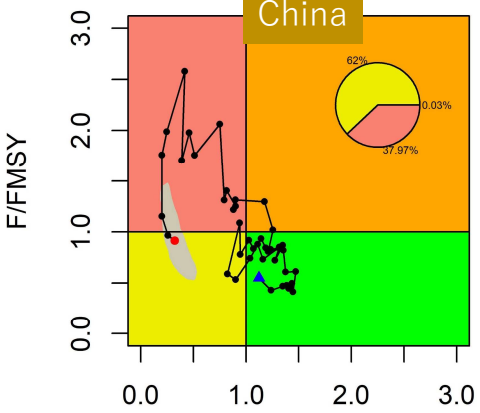




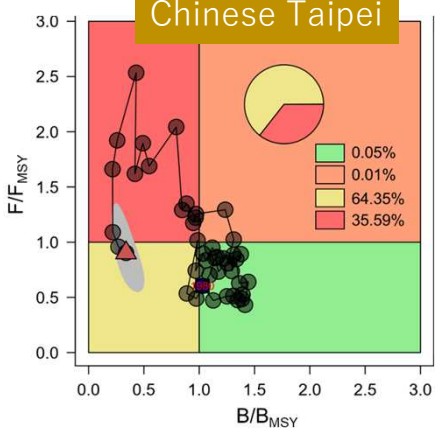


Separate and combined Kobe plots

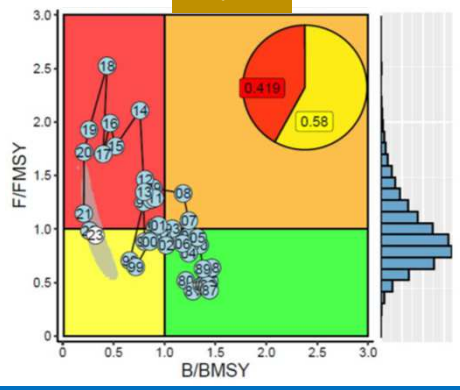
China



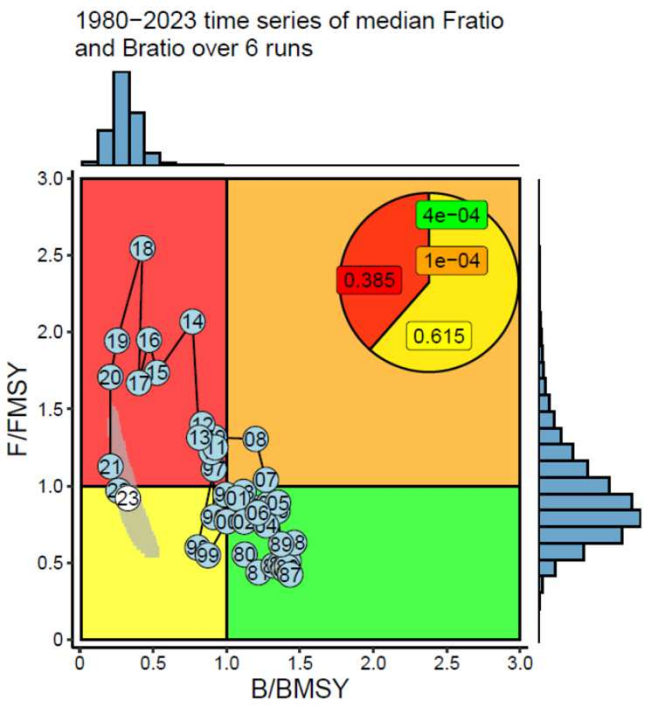
Chinese Taipei



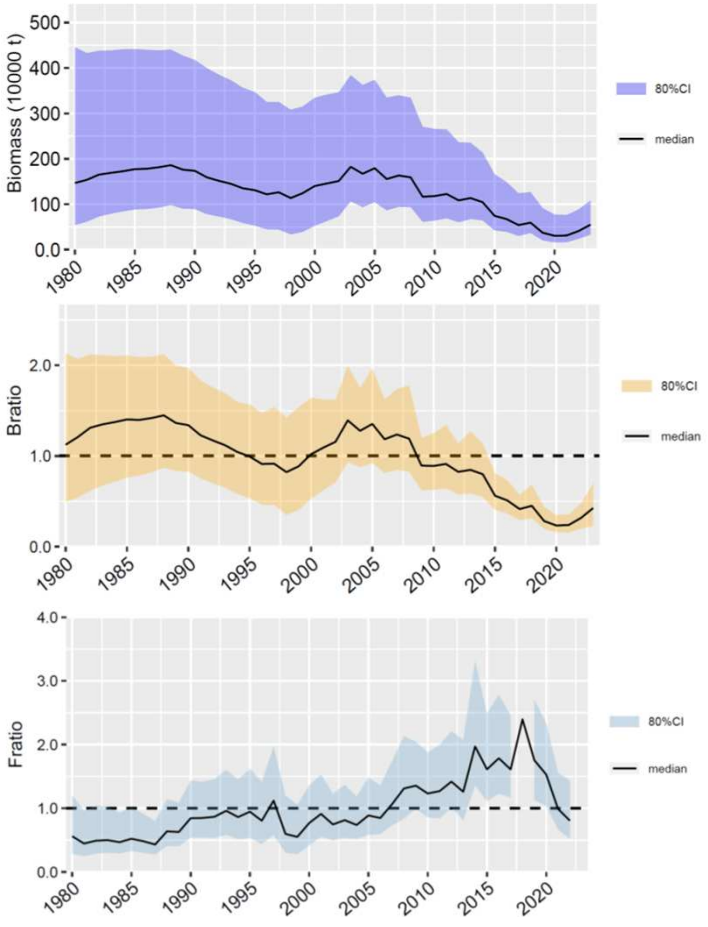
Japan



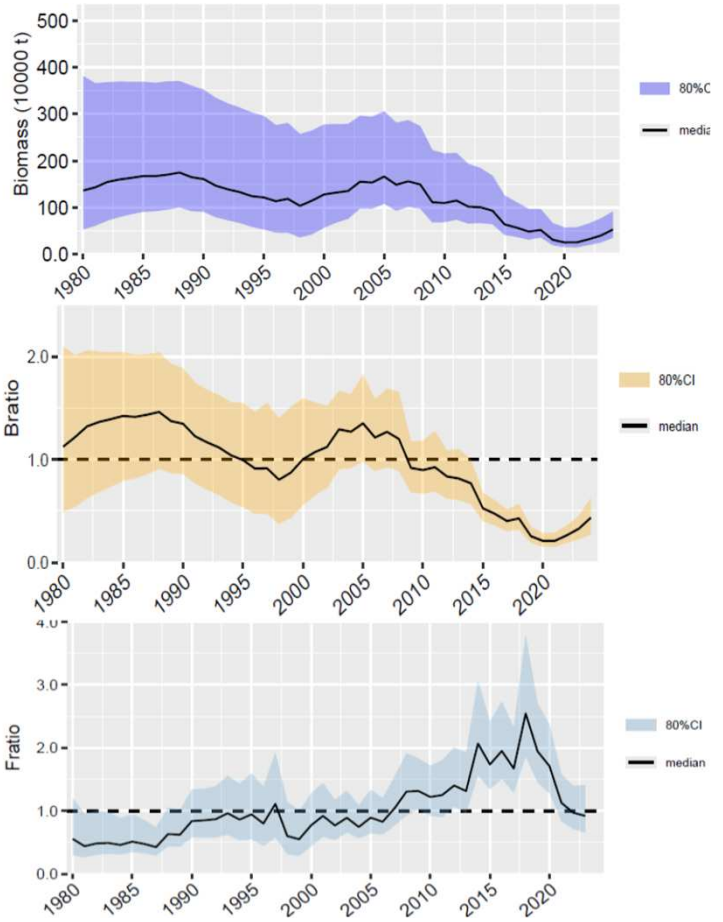
Combined



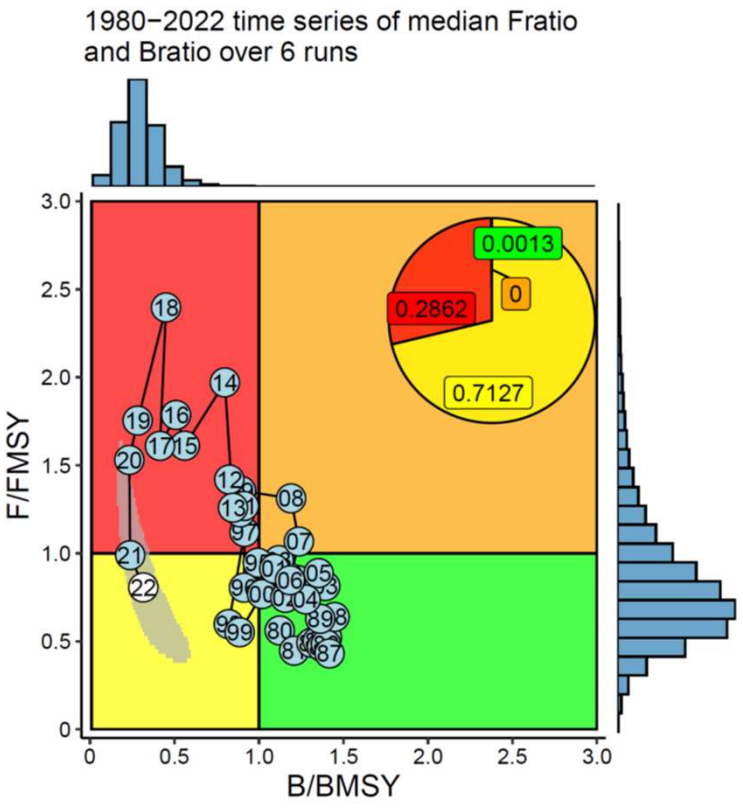
Results in 2023



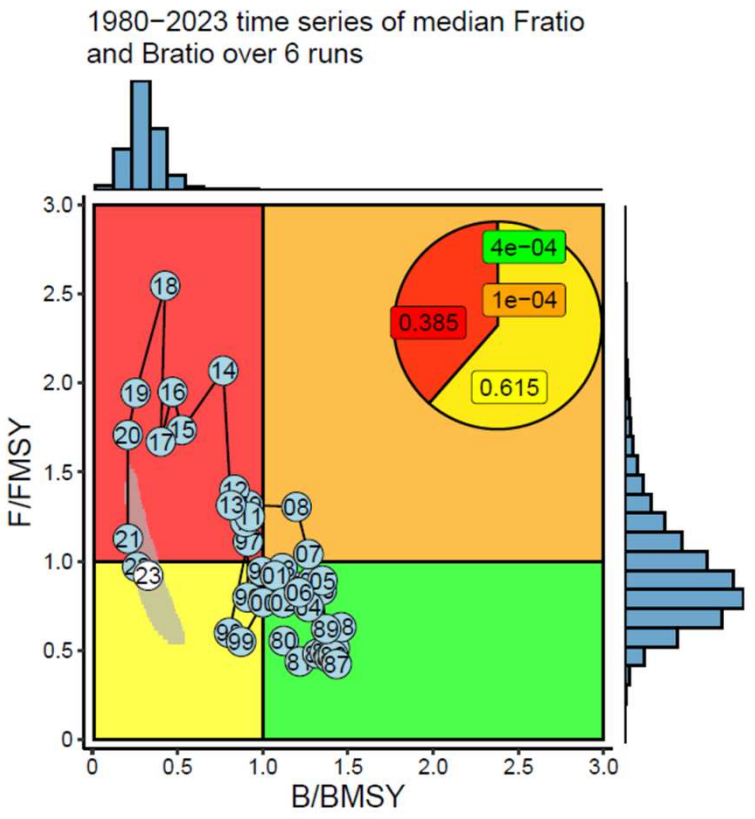
Results in 2024



2023 assessment



2024 assessment



Application of HCR in SSC-PS

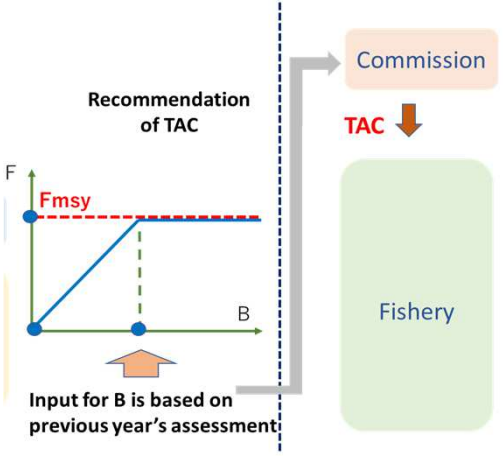
Item 12. Development of recommendations to improve conservation and management of Pacific saury stock

12.1 Application of the adopted HCR to set a TAC in 2025

63. The SSC PS **used the interim harvest control rule (HCR)** for Pacific saury adopted by NPFC in April 2024 under **CMM 2024-08** for Pacific Saury to calculate TAC in the 2025 fishing year. Based on inputs from the assessment, (unconstrained) $TAC_{2025} = (B_{2024} * F_{MSY} * (B_{2024}/B_{MSY}) = 75{,}741$ mt. Based on the adopted HCR, the TAC will be constrained to change by no more than 10% from one year to the next. The constrained 2025 TAC would be 0.9 x 225,000 = 202,500 mt.

64. The SSC PS noted that the unconstrained TACs calculated from the interim HCR for 2024 (73,490 metric tons) and 2025 (75,741 metric tons) are quite similar. This issue could persist in future years and complicate stakeholders' expectations about stock rebuilding and status. Improvements to the modeling and HCR approaches, as described elsewhere in this report, are important because they would help avoid such problems.

Reference points and key parameters



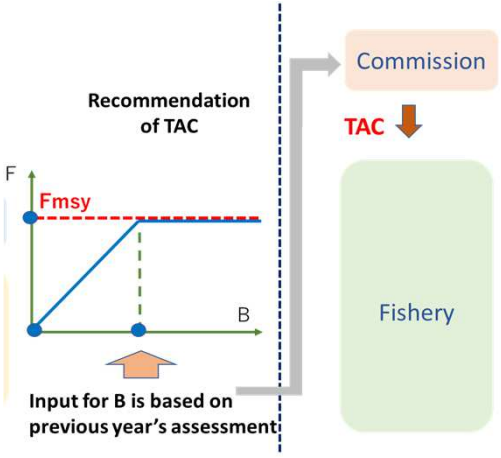
2023 assessment

	Median
C_2022 (10000 t)	10.009
AveC_2020_2022	11.066
AveF_2020_2022	0.337
F_2022	0.245
FMSY	0.314
MSY (10000 t)	39.657
F_2022/FMSY	0.806
AveF_2020_2022/FMSY	1.111
K (10000 t)	264.054
B_2022 (10000 t)	40.820
B_2023 (10000 t)	54.940
AveB_2021_2023	42.410
BMSY (10000 t)	128.100
BMSY/K	0.481
B_2022/K	0.155
B_2023/K	0.209
AveB_2021_2023/K	0.163
B_2022/BMSY	0.316
B_2023/BMSY	0.426
AveB_2021_2023/BMSY	0.331

2024 assessment

	Median
C_2023 (10000 t)	11.836
AveC_2021_2023	10.352
AveF_2021_2023	0.328
F_2023	0.297
FMSY	0.330
MSY (10000 t)	39.440
F_2023/FMSY	0.920
AveF_2021_2023/FMSY	1.008
K (10000 t)	248.067
B_2023 (10000 t)	39.875
B_2024 (10000 t)	52.763
AveB_2022_2024	41.563
BMSY (10000 t)	120.100
BMSY/K	0.485
B_2023/K	0.161
B_2024/K	0.212
AveB_2022_2024/K	0.169
B_2023/BMSY	0.328
B_2024/BMSY	0.435
AveB_2022_2024/BMSY	0.345

Reference points and key parameters



2023 assessment

	Median
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Summary of discussions

11. …..Based on inputs from the assessment, TAC2025 = ($B2024*F^{MSY}*(B^{2024}/B^{MSY})$ 75,741 mt. Based on the interim HCR, the TAC will be constrained to change by no more than 10% from one year to the next. The constrained 2025 TAC would be 0.9 x 225,000 = 202,500 mt.

12. The SWG MSE PS reviewed the application and endorsed the TAC calculation.

Some notes:

- China raised concerns that scaling issues in the BSSPM model could affect long-term stock projections and the interim HCR
- Other Members pointed out that the projected TAC trends were not substantially different from robustness tests considering reduced stock productivity.

Agenda Item 5. Discussion toward development of management procedures (MPs) as a mid-term goal

5.1 Management objectives
5.2 Operating models
5.3 Management procedures
5.4 Performance indicators

Draft table of elements that could be considered when developing a full MP in the MSE for Pacific saury

Items	Development of interim HCR	Development of full MP
Management objectives	• Primary (recovery) • Secondary (avoid risk) • Tertiary (catch)	The three main objectives will be used as previously agreed. Members may also consider additional objectives relating to the following. • Categories: Stock Status (e.g. B, PGK, Abundance), Safety (Avoiding Blim), Yield (catch) stability, socio-economic (incl. consideration of aspirations of SIDS) and ecological/ecosystem • Achieve robustness under climate changes.
Operating models	BSSMP • Age: aggregated over life • Space: combined over EEZ & CA • Time: annual	Age-structured models (SS3, other state-space models) • Age: 0/1 • Space: so far combined • Time: so far annual (seasonal/monthly) • Include key uncertainties (M, S-R, selectivity…) May consider some spatial elements (i.e. distribution shift) for investigating spatial management (depending on progress on new modelling)

Draft table of elements that could be considered when developing a full MP in the MSE for Pacific saury

Items	Development of interim HCR	Development of full MP
HCRs and MPs	• Set an annual TAC • Just HCR assuming availability of unbiased estimates	• Set an annual TAC • Model-based (incl. assessment) or empirical MPs or combined • May need to consider spatial allocation particularly for juvenile protection • Evaluate advantages and disadvantages of constraints such as existing MAC and a minimum TAC (particularly in light of scale and climate uncertainties)
Main input (incl. assessment)	• Estimates of key reference points from BSSPM analyses	• Estimates of key reference points from BSSPM or others • Address uncertainty in estimates

Draft table of elements that could be considered when developing a full MP in the MSE for Pacific saury

Items	Development of interim HCR	Development of full MP
Time lag btw data & implementation	• 1-yr (survey) • 2-yrs (fisheries CPUE)	• Use the most recent CPUE and survey information from the current fishing year? • Consider the use of an in-season adjustment if possible
Climate impacts	• Considered as robustness case	• Routinely use as part of reference models or robustness testing • Explicitly link climate effects and biological parameters that affect stock size & productivities
Meta rules and others	• No definition of exceptional circumstances	• Develop definition of exceptional circumstances

Recommendations to the Commission (SWG-MSE-PS 06)

Agenda Item 8. Recommendations to the Commission

19. The SWG MSE PS recommends that the Commission note the TAC calculated for 2025 (paragraph 11).

20. The SWG MSE PS recommends that an invited expert be invited to the next SWG MSE PS meeting.

21. The SWG MSE PS recommends that the Commission endorse the holding of SWG MSE PS07 for one or two days between SC10 and COM10 in a virtual or hybrid format

22. The SWG MSE PS recommends that the Commission reaffirm the importance of including scientists, managers, and stakeholders at future meetings to facilitate communication and completion of this important work.

Schedule 2025-27

Meeting	Date	Task	Note
COM09	24-27 Mar 2025	• Review outcomes and recommendations from SWG MSE PS 06	In-person (hybrid)
Intersessional work (SSC-PS)	April-June 2025	• Development of age-structured models (as a part of work on conditioning of OMs)	Virtual
WG NSAM (SSC-PS)	July 2025	• Review further progress on age-structured modelling	In-person (hybrid)
SSC PS15	Sep 1-5, 2025	• Review abundance indices etc. • Review progress on new assessment models • Review progress on review of HCR works **(specifically issues on BSSPM)** • **Prepare for demonstration of empirical HCRs (if possible)**	Virtual
Intersessional work (SSC-PS)	Oct-Nov 2025	• Review further progress on age-structured modelling • Review further progress on evaluation of HCRs **(specifically issues on BSSPM)**	Virtual
SSC PS16	Dec 11-14, 2025	• **Update BSSPM analyses and update HCR-generated TAC for 2026** • **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)** • **Try to finalize specification of OMs for meeting the mid-term tasks on MSE**	In-person (hybrid)
SWG MSE PS 07	Jan/Feb 2026	• **Prepare for simple demonstration of MPs including empirical one** • **Review OMs and develop list of candidate MPs** • **Dialogue between managers, scientists and stakeholders**	?
COM10	2026	• Review outcomes and recommendations from SWG MSE PS 07	In-person (hybrid)
SC PS17-19, WG NSAM	2026	• Conduct technical works	
SWG MSE PS 8-9	Summer 2026 Winter 2027	• **Finalize evaluation of performance of candidate MPs** • **Recommendations of a few MPs to COM10**	In-person (hybrid)
COM11	2027	• Adoption of CMM on MP?	In-person (hybrid)

Acknowledgements

- All the participants for their constructive and dedicated discussion
- Larry Jacobson (invited expert)
- Alex Meyer (rapporteur)
- NPFC Secretariat team for excellent preparation and assistance