**North Pacific
Fisheries Commission**

NPFC

AGENDA ITEM 3. REVIEW THE ADOPTED HCR AND ITS RESULTS

## 3.1 TAC FOR 2025

3.2 HCR-GENERATED CATCH LEVEL FOR 2026

3.3 REVIEW OF THE ADOPTED HCR

42. The SSC PS noted that <u>non-stationary assumptions regarding stock productivity</u> should be examined in future assessments, as several key biological processes of Pacific saury are influenced by environmental change. In addition, <u>the assumption of hyperdepletion in CPUE</u> indices should be explored, given evidence such as substantial seasonal and interannual variability in fleet dynamics, which may indicate that fishing fleets do not consistently or promptly locate the main fish habitat.

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

Unconstrained CL = 75,741 mt
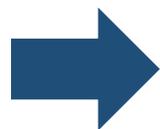
Results in 2025 assessment

	Median	Lower10%	Upper10%
C_2024 (10000 t)	15.556	15.556	15.556
AveC_2022_2024	12.463	12.463	12.463
AveF_2022_2024	0.258	0.137	0.414
F_2024	0.272	0.150	0.431
FMSY	0.269	0.130	0.444
MSY (10000 t)	38.165	30.860	45.319
F_2024/FMSY	1.027	0.719	1.526
AveF_2022_2024/FMSY	0.971	0.712	1.371
K (10000 t)	294.397	178.813	593.103
B_2024 (10000 t)	57.200	36.107	103.568
B_2025 (10000 t)	69.460	45.090	119.897
AveB_2023_2025	58.238	37.756	103.933
BMSY (10000 t)	142.100	91.670	266.603
BMSY/K	0.486	0.385	0.617
B_2024/K	0.197	0.127	0.282
B_2025/K	0.238	0.143	0.364
AveB_2023_2025/K	0.202	0.128	0.288
B_2024/BMSY	0.403	0.280	0.562
B_2025/BMSY	0.488	0.314	0.725
AveB_2023_2025/BMSY	0.411	0.285	0.573

Unconstrained CL = 91,180 mt

12.1 Application of the adopted HCR

The interim HCR for Pacific saury under CMM 2025-08 For Pacific Saury was used to calculate the annual catch level in the 2026 fishing year, while noting the lack of endorsement from China. Based on assessment inputs from Japan and Chinese Taipei, the unconstrained annual catch level for 2026 = $(B_{2025}*F_{MSY}*(B_{2025}/B_{MSY}))$ = 91,180 mt. Based on the adopted HCR, the constrained 2026 catch level would be 0.9 x 202,500 = 182,250 mt.

Chinese Taipei stated that based on thorough comparisons of recent stock assessment results across years and alternative model scenarios, contributing Members' assessments indicate substantial uncertainties in the estimation of key stock status indicators, including biomass, fishing mortality, and reference points F_{MSY} and B_{MSY}. In this regard, the estimated annual catch level derived from the interim HCR is subject to considerable uncertainty and potential error. While the HCR provides a consistent framework for translating stock status into management advice, the resulting calculated annual catch level should be interpreted with caution.

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

*12.1 Application of the adopted HCR*

The interim HCR for Pacific saury under CMM 2025-08 For Pacific Saury was used to calculate the annual catch level in the 2026 fishing year, while noting the lack of endorsement from China. Based on assessment inputs from Japan and Chinese Taipei, the unconstrained annual catch level for 2026 = $(B_{2025}*F_{MSY}*(B_{2025}/B_{MSY})) = 91{,}180$ mt. Based on the adopted HCR, the constrained 2026 catch level would be $0.9 \times 202{,}500 = 182{,}250$ mt.

Information on several catch series including HCR-recommended and actual TACs

- As a reference, the unconstrained annual catch level calculated from the interim HCR for 2026 increased by about 20% from 2025 (from 75,741 MT to 91,180 MT).
- The Chair provided the comparison of 1) theoretical unconstrained annual catch level calculated based on HCR under CMM 2024-08 using 2025 assessment results, 2) unconstrained catch level for 2024, 2025 and 2026 computed in 2023, 2024 and 2025 assessments, respectively, 3) actual catch, and 4) TAC actually applied. Theoretical unconstrained catch level in 1) is calculated as if the current HCR was applicable historically and assumes equilibrium reference points estimated in the latest stock assessment from 2025 (NPFC-2025-SSC PS16-IP09).
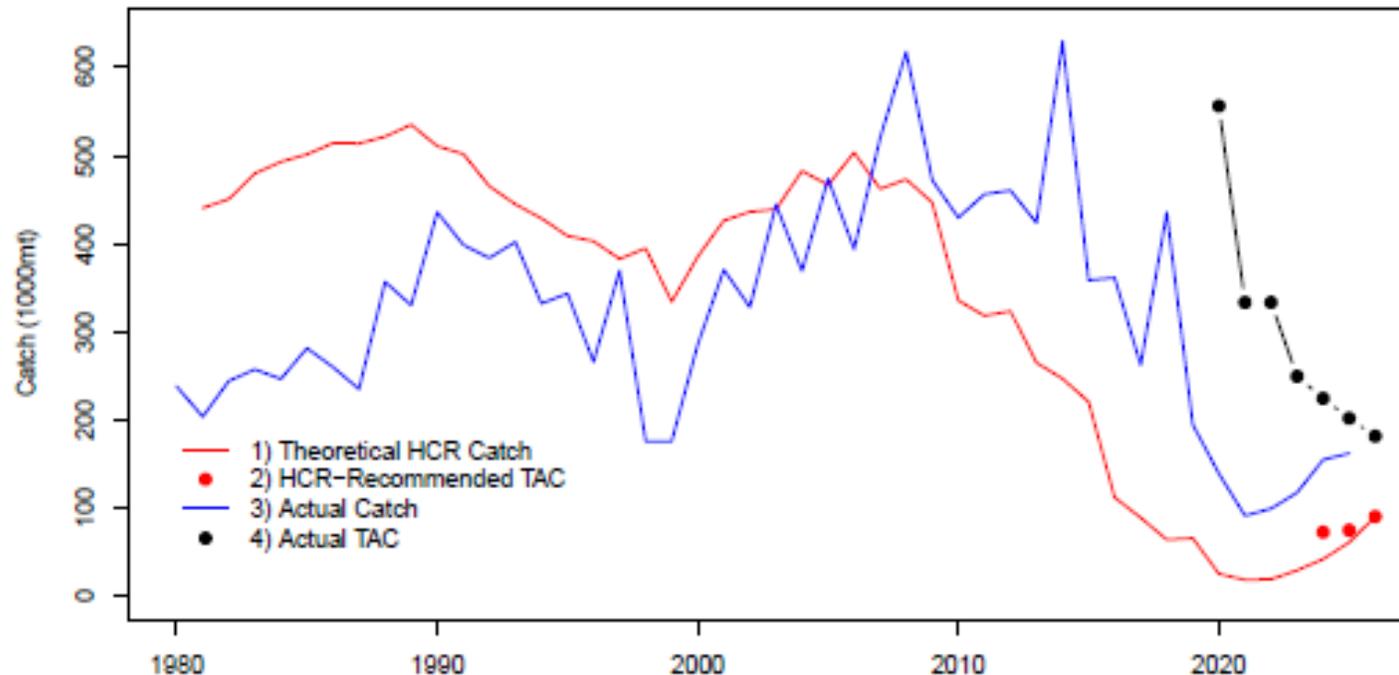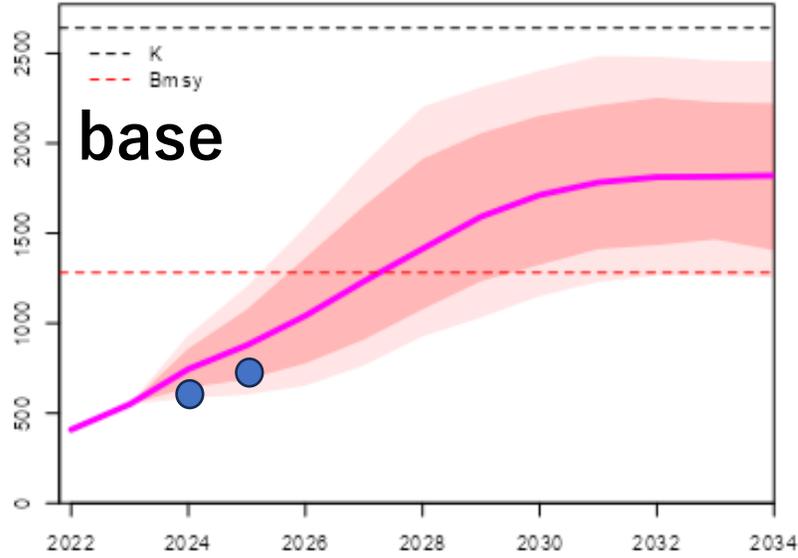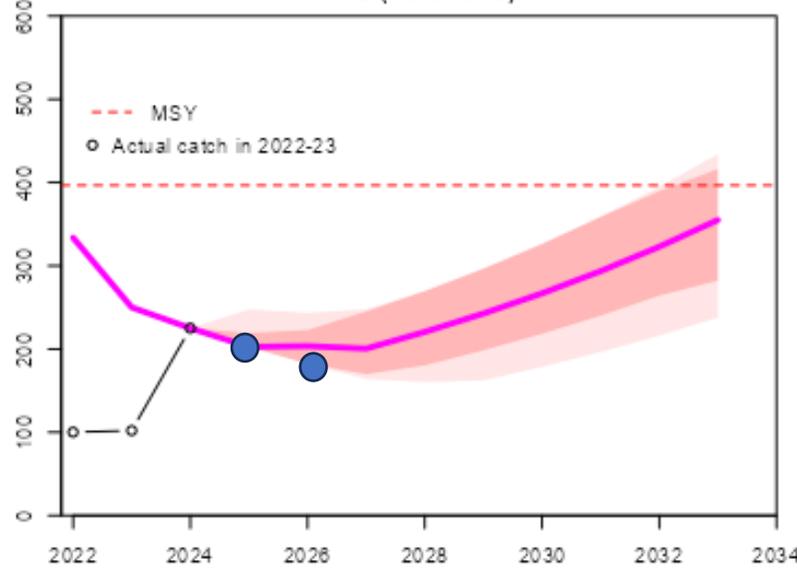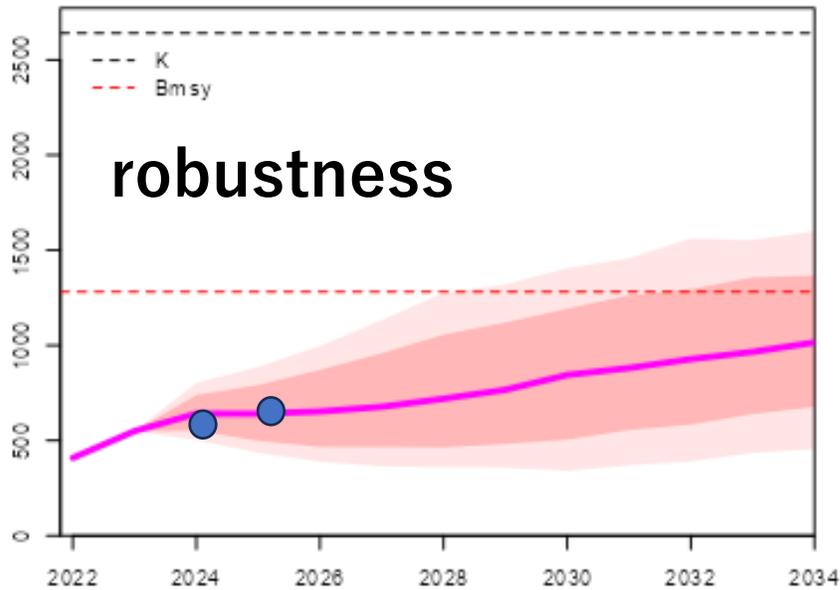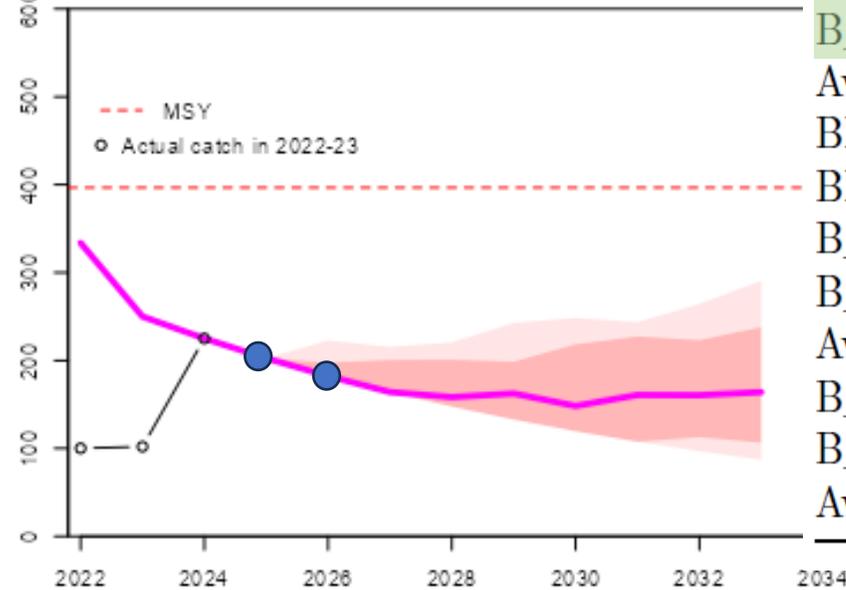
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B_2024/BMSY	0.403
B_2025/BMSY	0.488
AveB_2023_2025/BMSY	0.411

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)

(a) Recovery of the stock (prioritized objective):

    i. The stock status is recovered above B_{tar} within 5 years (by 2024-28) with 50% probability.

    ii. The stock status is maintained above the B_{tar} level in each of years 6-10 (2029-2033) with 50% probability.

(b) Avoiding unsustainable state of the stock (secondary objective):

    i. The annual probability in each of years 6-10 that the stock drops below B_{lim} should not exceed 10%.

    ii. The annual probability in each of years 6-10 that fishing mortality is above F_{lim} should not exceed 10%.

(c) Achieving high and stable catch (tertiary objective):

    i. Average catch over years 6-10 is as high as possible.

    ii. Catch in each of years 6-10 is as stable as possible.

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

NPFC

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

North Pacific Fisheries Commission

AGENDA ITEM 5. OTHER MATTERS

Schedule 2025-27

NPFC

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**	Virtual
COM10	2026	• Review outcomes and recommendations from SWG MSE PS 07	In-person (hybrid)
SC PS17-19, TWG 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)

Schedule (version 1, 2026-27)

Meeting	Date	Task	Note
COM10	Apr 14-17	• Recommend 2026 catch level based on the adopted HCR • Review outcomes and recommendations from SWG MSE PS 07 (including timeline of full MSE)	In-person (hybrid)
SWG NSAM	Jun / July	• Review progress of age-structured modelling (finalize specification) • Review issues arisen for the BSSPM	In-person (hybrid)
SWG MSE PS 08	Sep / Oct	• **Finalize the management objectives** • **Finalize conditioning of OMs (based on age-structured models with consideration of uncertainty of parameters and climate impacts, base and robustness cases)** ==Data-guillotine== • **Develop a list of candidate MPs (model-based, empirical)** • **Finalize performance indicators**	In-person (hybrid)
SSC-PS-17	Dec 15-17	• Prepare data for 2026 assessment (BSSPM, SS3) • **Review results of conditioning of OMs** • **Review results of preliminary runs of MPs**	Virtual
SSC-PS-18	Jan 19-22	• Review results of BSSPM and **application of the adopted HCR for computing 2027 CL (back-up)** • Review results of age-structured models • **Review progress of MSE**	In-person (hybrid)
	Jan / Feb	• **Running MSE and prepare results of performance of MPs**	
SWG MSE PS 09	Late Feb	• **Finalize evaluation of performance of candidate MPs** • **Recommendations of a few MPs to COM11**	In-person (hybrid)
COM11	April 12-15	• Adoption of CMM on MP? • First implementation of MP for 2027 TAC	In-person (hybrid)

Schedule (version 2, 2026-2028)

Meeting	Date	Task	Note
COM10	Apr 14-17	• Recommend 2026 catch level based on the adopted HCR • Review outcomes and recommendations from SWG MSE PS 07 (including timeline of full MSE)	In-person (hybrid)
SWG NSAM	Jun / July	• Review progress of age-structured modelling (finalize specification) • Review issues arisen for the BSSPM	In-person (hybrid)
SWG MSE PS 08	Sep / Oct	• **Re-start discussion on objectives, conditioning of OMs (based on age-structured models with consideration of uncertainty of parameters and climate impacts) and possible types of MPs**	Virtual
SSC-PS-17	Dec 15-17	• Prepare data for 2026 assessment (BSSPM, SS3) • **Review results of conditioning of OMs**	
SSC-PS-18	Jan 19-22	• Review results of BSSPM and **application of the adopted HCR** • Review results of age-structured models (completed) • **Review progress of MSE**	In-person (hybrid)
SWG MSE PS 09	Feb	• **Finalize management objectives** • **Review conditioning of OMs** • **Develop a list of candidate MPs (model-based, empirical)**	Virtual
COM11	April 12-15	• Review progress of MSE	In-person (hybrid)
SWG MSE PS 10	Summer	• **Finalize conditioning of OMs (based on age-structured models with consideration of uncertainty of parameters and climate impacts, base and robustness cases) Data-guillotine** • **Finalize a list of candidate MPs (model-based, empirical)** • **Finalize performance indicators**	In-person (hybrid)
		• **Running MSE and prepare results of performance of MPs (SSC will review in its meeting)**	
SWG MSE PS 11	Jan / Feb	• **Finalize evaluation of performance of candidate MPs** • **Recommendations of a few MPs to COM11**	In-person (hybrid)
COM12	April ?	• Adoption of CMM on MP?	In-person (hybrid)