North Pacific Fisheries Commission

NPFC-2023-SWG MSE PS04-Final Report

North Pacific Fisheries Commission
4th Meeting of the Joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific Saury (SWG MSE PS)

31 August – 2 September 2023
Port Vila, Vanuatu

REPORT

Agenda Item 1. Introductory items

1.1 Opening of the meeting

1. The 4th meeting of the joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific Saury (SWG MSE PS) was held in a hybrid format, with participants attending in-person in Port Vila, Vanuatu, or online via WebEx. The meeting was attended by Members from Canada, China, the European Union, Japan, the Republic of Korea, the Russian Federation, Chinese Taipei, the United States of America, and the Republic of 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) and Mr. Derek Mahoney (Canada), the co-Chairs of the SWG MSE PS.

2. Mr. Mahoney opened the meeting and welcomed the participants.

3. Mr. Felix Toa Ngwango, Principal Compliance Officer of the Vanuatu Fisheries Department, welcomed the participants to Vanuatu and stated that their presence was an expression of their shared commitment to the advancement of collective goals. He also noted that SSC PS11 had concluded successfully with highly fruitful discussions, and hoped that this momentum and spirit of cooperation would be maintained during the SWG MSE PS. Lastly, Mr. Ngwango expressed his hope that the collective efforts of the SWG MSE PS would contribute to the wellbeing of the Pacific saury stock.

1.2 Adoption of agenda

4. 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

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
Web www.npfc.int

5. The Science Manager, Dr. Aleksandr Zavolokin, outlined the meeting arrangements.

6. Mr. Alex Meyer was selected as rapporteur.

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

2.1 SWG MSE PS03

7. Dr. Kitakado (hereafter "co-Chair") presented the outcomes and recommendations from the SWG MSE PS03 meeting.

2.2 SSC PS11

8. The co-Chair presented the outcomes and recommendations from the 11th Meeting of the Small Scientific Committee on Pacific Saury (SSC PS11).

2.3 COM07

2.3.1 CMM 2023-08 for Pacific Saury

9. The Science Manager presented the outcomes from the 7th Commission meeting, including an overview of Conservation and Management Measure (CMM) 2023-08 for Pacific Saury.

2.3.2 NPFC Performance Review

10. The Science Manager presented an overview of the NPFC Performance Review and outlined some recommendations from the Performance Review report that concern Pacific saury.

11. The co-Chair informed the SWG MSE PS that, in consultation with Mr. Mahoney, he would draft the proposed response to these recommendations while liaising with the SC Chair and the Secretariat by the next SWG MSE PS meeting in January 2024.

2.3.3 Resolution on Climate Change

12. The Science Manager presented an overview of the Resolution on Climate Change.

Agenda Item 3. Overview of MSE

3.1 Roles of SWG MSE PS in the NPFC process

3.2 Basic principles of MSE

3.3 Roles of harvest control rules (HCRs) and management procedures (MPs)

13. The co-Chair presented an overview of an MSE process (NPFC-2023-SWG MSE PS04-IP01), including the role of the SWG MSE PS, the basic principles of an MSE, the roles of harvest control rules (HCR) and management procedures (MP), and the advantages of MPs under MSE over traditional approaches.

14. The SWG MSE PS noted that tuning is often a part of other regional fisheries management organizations' (RFMOs') MSE processes but that the SSC PS had agreed not to conduct tuning as there are still multiple candidate HCRs being considered and it is not possible to set the tuning criteria.

15. The SWG MSE PS noted the importance of using consistent terminology when discussing the MSE process and that sometimes, multiple terms are used to describe the same concept, for example "performance indicators," "performance measures," and "performance metrics," which can cause confusion. In this particular case, the SWG MSE PS indicated its preference for the term "performance indicators."

3.4 Examples in other RFMOs

16. Pew gave a presentation on examples of MSE processes from other RFMOs and publicly available resources for better understanding the MSE process (NPFC-2023-SWG MSE PS04-OP01).

17. The SWG MSE PS suggested that it may be worthwhile reviewing other RFMOs' MSE processes for other species that, like Pacific saury, are short-lived.

3.5 Quick demonstration of MSE

18. The co-Chair presented a quick demonstration of how an MSE works using a Shiny application.

19. The co-Chair explained that he would make the current version of the Shiny application available to Members as a demonstration tool, so that they could try testing various HCRs and parameters for better understanding the MSE process. He cautioned that the current version does not include the latest data and has not been adjusted to reflect the discussions of SSC PS11. He further explained that, to conduct the final simulations, he would use a tool that has a different user interface to the Shiny application but has the same underlying code, while using the most up-to-date data and updating the specifications to reflect the discussions of SSC PS11 and SWG MSE PS04.

20. The invited expert suggested that it would be useful to keep track of the various runs that Members conduct using the Shiny application and suggested that all output graphs should describe the following information:
    (a) Parameters used
    (b) Date run

(c) Version number of the Shiny application
(d) Name of user
(e) Indication that this is a "draft" simulation

3.6 Discussion

21. The SWG MSE PS agreed that including economic factors, such as relative revenue, cost and profit, as performance indicators, would be useful for communicating the potential impact of different HCRs to managers and stakeholders. However, the SWG MSE PS acknowledged that it may be difficult to develop such performance indicators for the short-term HCR and perhaps they would be more appropriate for the longer-term MSE process.

Agenda Item 4. Review progress on development of an HCR as a short-term task

22. The SWG MSE PS reviewed and finalized the draft specification of simulation for testing HCRs prepared by SSC PS11 (Annex D).

4.1 Management objectives, reference points and tuning criteria

23. The SWG MSE PS reviewed and updated the three types of management objectives discussed at SWG MSE PS01, SWG MSE PS02, and SWG MSE PS03. The SWG MSE PS agreed to continue discussions around these three objectives below, putting higher priority on (a).
    (a) Recovery of the stock (prioritized objective):
        i. The stock status is recovered above B_{tar} within 5 years with 50% probability.
        ii. The stock status is maintained above the B_{tar} level in each of years 6-10 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.

24. The SWG MSE PS noted that numerical specifications such as probabilities and target years stated in the objectives above may require adjustment after the simulation is carried out if none of the evaluated HCRs can meet the management objectives.

25. The SWG MSE PS considered the three target reference points considered by the SSC PS and

agreed to use the target reference point based on B_{MSY}, noting that the Convention stipulates that measures shall ensure fisheries resources are maintained at or restored to levels capable of producing MSY, and that MSY-based reference points are commonly used in many other RFMOs.

4.2 Conditioning of operating models (OMs)

26. The SWG MSE PS noted the previous discussions on the conditioning of OMs by the SWG MSE PS and the SSC PS and updated the OM specifications.

27. The SWG MSE PS agreed to include additional process error assumptions as sensitivity analyses taking into account past periods of high and low productivity. The sensitivity analyses will help to evaluate the potential decadal variation of population dynamics identified in previous studies for the Pacific saury stock.

28. The SWG MSE PS noted that changes in the productivity of the system will violate assumptions of stationarity in models, thus changing MSY, B_{MSY}, F_{MSY} and the speed of stock response to environmental change and/or fishing. This should be explored in future simulations examining the process errors in the determination of stock status and management procedures when developing the future full MSE framework.

29. The SWG MSE PS agreed on a reference scenario and two sensitivity scenarios for simulating the process error as follows:

	Model	**Value**	**Note**	**Scenario**
M1	IID log-normal assumption	Process error ~ N(0, tau^2)	Tau is a median process error CV in 2023 BSSPM.	Reference scenario
M2	IID log-normal assumption with a mean adjustment	Process error ~ N(-0.15, tau^2)		(Sensitivity scenario) "Climate impacts cause negative productivity" scenario
M3	IID log-normal assumption with a mean adjustment	Process error ~ N(0.1, tau^2)		(Sensitivity scenario) "Climate impacts cause positive productivity" scenario

30. The SWG MSE PS noted that asymmetrical assumptions of negative and positive process errors are appropriate because 0.15 is the approximate average of historical process errors during a less productive period and 0.1 is the approximate average of historical process errors during a productive period.

4.3 Candidate HCRs and constraints therein

31. The SWG MSE PS considered the candidate HCRs and the constraints therein. The SWG MSE PS indicated its preference for HCR1 as the short-term HCR. The SWG MSE PS agreed to also run simulations to test HCR0 as a contrast for evaluating HCR1. The SWG MSE PS reaffirmed the potential value of HCR2 and HCR3 in that they allow for the adjustment of the total allowable catch based on the stock assessment result one year ago during the fishing season, which is important in light of Pacific saury's short lifespan and interannual fluctuation in recruitment strength, but recognized that their development and analysis would require additional time and that they were therefore not appropriate for consideration for the short-term HCR. The required analyses will be deferred until after the development of age-structured models, which may alleviate some of the problems with lags in the management process.

32. Regarding additional elements for the specification of HCRs, the SWG MSE PS agreed to add consideration of a range of constraints, including no constraint, for the maximum allowable change (MAC) in TAC.

4.4 Performance indicators

33. The SWG MSE PS reviewed and updated the performance indicators discussed at SWG MSE PS01, SWG MSE PS02, and SWG MSE PS03 (Annex D).

4.5 Simulation platform

34. The co-Chair reiterated that he would update the simulation platform with the most up-to-date data and specifications that reflect the discussions of SSC PS11 and SWG MSE PS04.

4.6 Template for presentation of results

35. The SWG MSE PS agreed to continue to discuss how to present the results of the MSE, noting the importance of clear communication and ease of understanding.

4.7 Other matters

36. No other matters were discussed.

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

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

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

37. 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.

Agenda Item 6. Implementation schedule and safeguard for exceptional circumstances

6.1 Implementation schedule of an HCR

38. The SWG MSE PS reviewed and maintained the implementation schedule agreed to at the SWG MSE PS03 meeting (Annex D).

6.2 Mid-term plan of implementation and its review process

39. 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.

6.3 Definition of exceptional circumstances

40. The SWG MSE PS agreed not to define exceptional circumstances at this time. The SWG MSE PS noted that it would review the results of the MSE simulations at its next meeting and could consider whether or not the definition of exceptional circumstances is necessary at that time.

Agenda Item 7. Other matters

41. The SWG MSE PS noted the importance of capacity building efforts, such as multiple rounds of workshops, to facilitate deeper understanding of MSE and associated elements, such as HCRs by managers and stakeholders including the possible need for resources from NPFC.

Agenda Item 8. Timeline and future process

8.1 Timeline

42. The SWG MSE PS reviewed the timeframe agreed to at SWG MSE PS03 and updated it (Annex E).

8.2 Future process with assistance of SSC PS

43. The SWG MSE PS noted that the results of the MSE simulation would be presented at SSC PS12 for technical feedback and that the final results would be presented at SWG MSE PS05.

8.3 Workplan till SWG MSE PS05 meeting

44. The SWG MSE PS re-affirmed a workplan of intersessional activities until the 5th SWG MSE PS meeting and 8th Commission meeting (Annex E).

Agenda Item 9. Recommendations to the Commission

45. The SWG MSE PS recommends that the Commission consider capacity building efforts to facilitate deeper understanding of MSE and HCRs by managers and stakeholders, such as

holding multiple rounds of workshops.

46. The SWG MSE PS confirmed that the invited expert, Dr. Larry Jacobson, would be invited to the next SWG MSE PS meetings.

47. The SWG MSE PS reaffirmed that future meetings should include scientists, managers and stakeholders to facilitate communication and completion of this important work.

Agenda Item 10. Adoption of report

48. The SWG MSE PS04 Report was adopted by consensus.

Agenda Item 11. Close of the meeting

49. The co-Chair thanked the participants for their constructive engagement and productive discussions, the invited expert for his guidance, the Secretariat and the rapporteur for their support, and Vanuatu for its hospitality.

50. The meeting closed at 10:35 on 2 September 2023, Port Vila time.

Annexes:

Annex A – Agenda
Annex B – List of documents
Annex C – List of participants
Annex D – Specification of simulation for testing HCRs
Annex E – Timeline and tasks

Annex A

Agenda

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4.3 Candidate HCRs and constraints therein

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4.6 Template for presentation of results

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8.2 Future process with assistance of SSC PS

8.3 Workplan till SWG MSE PS05 meeting

Agenda Item 9. Recommendations to the Commission

Agenda Item 10. Adoption of report

Agenda Item 11. Close of the meeting

Annex B

List of documents

MEETING INFORMATION PAPERS

Document Number	Title
NPFC-2023-SWG MSE PS04-MIP01	Meetings Information
NPFC-2023-SWG MSE PS04-MIP02	Provisional Agenda
NPFC-2023-SWG MSE PS04-MIP03 (Rev. 1)	Annotated Indicative Schedule

REFERENCE DOCUMENTS

Document Number	Title
NPFC-2023-SSC PS11-Draft Report	Draft SSC PS11 meeting report including specifications in Annex I
NPFC-2023-SSC PS11-RP02	2nd intersessional SSC PS meeting summary
NPFC-2023-SSC PS11-RP03	3rd intersessional SSC PS meeting summary
CMM 2023-08	CMM 2023-08 for Pacific Saury
	NPFC Performance Review
	Resolution on Climate Change
NPFC-2023-SWG MSE PS03-Final Report	SWG MSE PS03 report

INFORMATION PAPERS

Document Number	Title
NPFC-2023-SWG MSE PS04-IP01	What is “Management Strategy Evaluation”?

OBSERVER PAPERS

Document Number	Title
NPFC-2023-SWG MSE PS04-OP01	Management Procedure Education & Outreach Tools

Annex C

List of participants

CO-CHAIRS

Toshihide KITAKADO
kitakado@kaiyodai.ac.jp

Derek MAHONEY
derek.mahoney@dfo-mpo.gc.ca

CANADA

Chris ROOPER
chris.rooper@dfo-mpo.gc.ca

Janelle CURTIS
Janelle.Curtis@dfo-mpo.gc.ca

CHINA

Ce LIU
liuce@cofa.net.cn

Yong CHEN
yong.chen.2@stonybrook.edu

Libin DAI
644318716@qq.com

Chuanxiang HUA
cxhua@shou.edu.cn

Qiuyun MA
qyma@shou.edu.cn

EU

Karolina MOLLA GAZI
karolina.mollagazi@wur.nl

JAPAN

Takumi FUKUDA
takumi_fukuda720@maff.go.jp

Kazuhiro OSHIMA
oshima_kazuhiro28@fra.go.jp

Taiki FUJI
fuji_taiki65@fra.go.jp

Midori HASHIMOTO
hashimoto_midori91@fra.go.jp

Hiroshi KUBOTA
kubota_hiroshi89@fra.go.jp

Hiroomi MIYAMOTO
miyamoto_hiroomi47@fra.go.jp

Chiaki MIZUGAKI
chiaki_mizugaki010@maff.go.jp

Shin-Ichiro NAKAYAMA
nakayama_shinichiro16@fra.go.jp

Miyako NAYA
naya_miyako88@fra.go.jp

Shuya NAKATSUKA
nakatsuka_shuya49@fra.go.jp

Shingo OTA
shingo_ota810@maff.go.jp

Satoshi SUYAMA
suyama@affrc.go.jp

Wataru TANOUE
wataru_tanoue550@maff.go.jp

Haruo TOMINAGA
haruo_tominaga170@maff.go.jp

Yukiya UCHIDA
yukiya_uchida230@maff.go.jp

Kyutaro YASUMOTO
kyutaro_yasumoto890@maff.go.jp

KOREA

Jeongseok PARK
jeongseokpark@korea.kr

Hyejin SONG
hyejinsong@korea.kr

RUSSIA

Vladimir KULIK
vladimir.kulik@tinro.ru

Igor CHERNIENKO
chernienko.igor@gmail.com

CHINESE TAIPEI

Yi-Jay CHANG
yjchang@ntu.edu.tw

Jhen HSU
jhenhsu@ntu.edu.tw

Wen-Bin HUANG
bruce@gms.ndhu.edu.tw

USA

Erin BOHABOY
erin.bohaboy@noaa.gov

VANUATU

Lucy Andrea JOY
ljoy@fisheries.gov.vu

Falma AIVIJI
falma.pala19@gmail.com

Kevin LIN
kevin.mdfc@msa.hinet.net

Ngwele JEYALDA
njeyalda@fisheries.gov.vu

Mei-Chin JUAN
meichin.mdfc@gmail.com

Ada SOKACH
akettner@fisheries.gov.vu

OBSERVERS

THE PEW CHARITABLE TRUSTS

Dave GERSHMAN
dgershman@oceanfdn.org

Ashley WILSON
awilson@pewtrusts.org

INVITED EXPERT

Larry JACOBSON
larryjacobson6@gmail.com

RAPPORTEUR

Alex MEYER
meyer@urbanconnections.jp

SECRETARIAT

Robert DAY
rday@npfc.int

Alex ZAVOLOKIN
azavolokin@npfc.int

Sungkuk KANG
skang@npfc.int

Natsuki HOSOKAWA
nhosokawa@npfc.int

Annex D

Specification of simulation for testing HCRs

1. Management Objectives

The SWG MSE PS **agreed** to continue to base discussions around the three objectives of (a) recovery of the stock, (b) avoiding unsustainable state of the stock, and (c) achieving high and stable catch, with putting a high priority on (a) given the current stock condition.

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

i. The stock status is recovered above B_{tar} within 5 years with 50% probability;

ii. The stock status is maintained above the B_{tar} level in each of years 6-10 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.

Note: Any numerical specification such as probabilities and target years stated in the objectives above may require adjustment after the simulation is carried out if none of the evaluated HCRs can meet the management objectives.

Table 1. The current list of default value and potential ranges for biological reference points

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

2. Harvest Control Rules (HCRs)

HCR0: TAC_y= Fmsy*$\hat{B}_{y-1}$ (as shown in Figure 1)

HCR1: $TAC_y = a_{y\text{-}1}$*Fmsy*$\hat{B}_{y-1}$, where $a_{y\text{-}1}$=min(1, $\hat{B}_{y-1}/\hat{B}_{msy}$) (as shown in Figure 1)

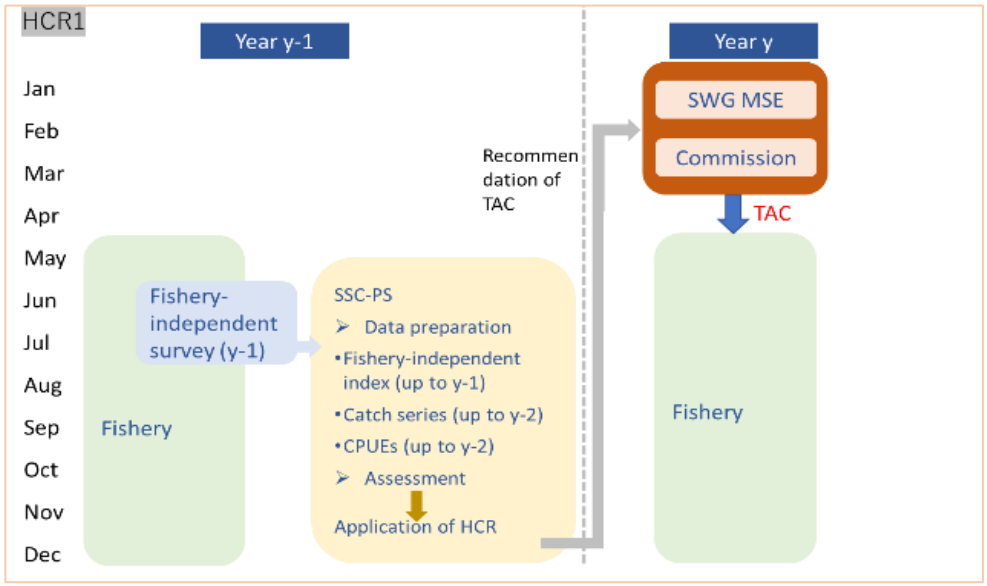


Figure 1. Illustration of the HCR options (HCR0-HCR1).

Table 2. Additional elements for specification of HCRs.

Item	**Options**
Input of B in HCR	1) previous single year 2) average of previous two years
Maximum allowable change (MAC) in TAC over two consecutive years	A) 20, 30, 40% + no constraint for option 1) above B) 20, 25% and + no constraint for option 2) above
Management cycle	1 year

HCR1 (2 options for inputs of B with different MAC options) [4+3]

HCR0 (single B*single max change for a representative option in HCR) [1]

3. Operating models (OMs)

Basic structure

The SWG MSE PS agreed that Option A (the use of the current interim stock assessment model, BSSPM, as a basis with consideration of uncertainties in estimated parameters and process errors) is to be used as the default option. OMs are to be conditioned based on the most recent BSSPM stock assessment results (aggregated over 3 runs =3 Members for each base case).

For application of HCR0 in year y:

Estimate of biomass in previous year (y-1) as $\log(\hat{B}_{y-1}\hat{F}_{msy}) = \log(B_{y-1}F_{msy}) - 0.5\,\sigma^2 + \varepsilon$

For application of HCR1 in year y:

Estimate of B-ratio (B/Bmsy) in previous year (y-1) as

$$\log(\frac{\hat{B}_{y-1}}{\hat{B}_{msy}}\hat{B}_{y-1}\hat{F}_{msy}) = \log(\frac{B_{y-1}}{B_{msy}}B_{y-1}F_{msy}) - 0.5\,\sigma^2 + \varepsilon$$

The error distribution will be assumed by referring the uncertainty in the actual computation.

Table 3. Specification of OMs for generating future data as input for HCR

Item	Value	Note
Catch in 2023 TAC in 2023	C2023 (actual)? TAC2023 = 150,000 (tons)	Preliminary number will be available in Dec meeting.
Terminal year in OM conditioned by the 2023 BSSPM using the actual data (B2023)	1) Use MCMC samples over 3 Members' runs in each base case 2) Use a median value over 3 Members' runs in each base case	
Intrinsic rate of increase (r)	Ditto	
Carrying capacity (K)	Ditto	
Shape parameter (z)	Ditto	
Fmsy in future application of HCR	See the formula and figures above.	
B (one year time lag)	See the formula and figures above.	
B/Bmsy	See the formula and figures above.	
Initial year of future simulation	2024	
Implementation error	None	

Process errors accounting for environmental effects

Table 4. Assumptions for process errors

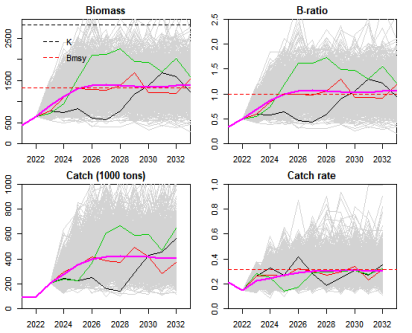
	Model	Value	Note	
M1	IID log-normal assumption	Process error ~ N(0, tau^2)	Tau is a median process error CV in 2023 BSSPM.	Reference scenario
M2	IID log-normal assumption with a mean adjustment	Process error ~ N(-0.15, tau^2)		(Sensitivity scenario) "Climate impacts cause negative productivity" scenario
M3	IID log-normal assumption with a mean adjustment	Process error ~ N(0.1, tau^2)		(Sensitivity scenario) "Climate impacts cause positive productivity" scenario

4. Performance indicators for evaluating HCRs (tables and figures are only illustrative purposes)

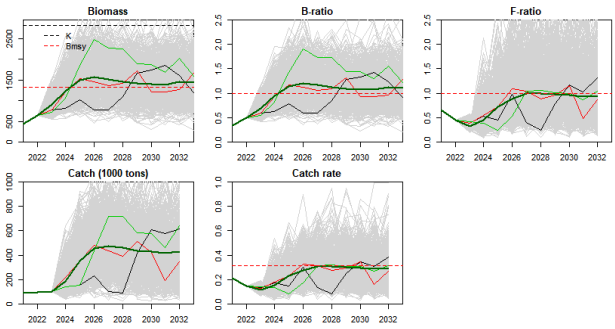
1) Time series plots for Biomass, Bratio, Fratio, catch and catch rate. Time trajectories of several

key performance indicators for HCR0, HCR1. The thick line is the median of 1000 simulations, and the three colored lines in each plot show example trajectories (add lines for 10% lower bound).

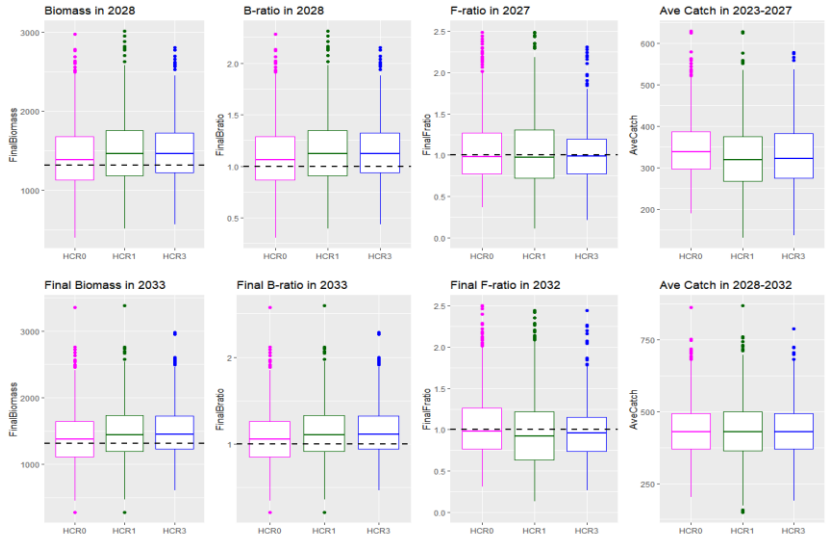
HCR0



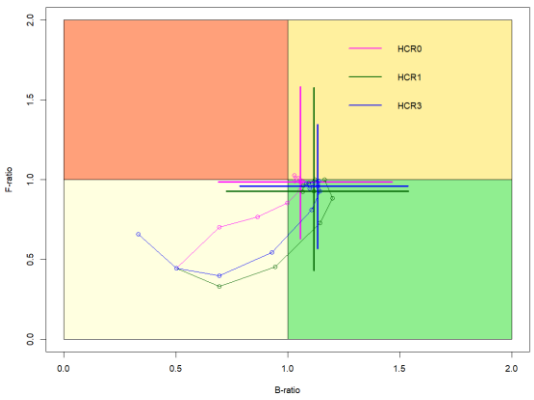
HCR1



2) Box plots of performance indicators for. Note that, in this simulation, no restriction was placed on the maximum value of change in consecutive years.



3) Trade-off plots 1: Time trajectories of B- and F-ratios for HCR0 and HCR1 from 2024 to 2033. Each cross refers to the 80% interval for both indices in 2033.



4) Trade-off plots 2: Bratio against the average catch (to come)

5) Tables for Pr(B > Btar), Pr(B < Blim) and Pr(F > Flim) relevant to the objectives (a) and (b) with the default reference points (Btar=Bmsy, Blim=0.35, and Flim=1.35Fmsy). Note that all the probabilities related to the biomass are calculated for the biomass at the beginning of year.

(a) Recovery of the stock:

i. Probabilities that the stock status is above B_{tar} at 1, 2,…, 10years after the HCR is implemented;

ii. Probabilities that the stock status is in Kobe green quadrant at 1, 2,…, 10 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, …, 10 years after the HCR is implemented;

ii. Probabilities that the fishing mortality exceeds F_{lim} at 1, 2, …, 10 years after the HCR is implemented.

(c) Achieving high and stable catch:

i. Average catch by 1-5, 6-10 years after the HCR is implemented;

ii. Annual catch variation by 5, 10 years after the HCR is implemented;

iii. Probabilities that the TAC hits the predetermined maximum change by 5, 10 years after the HCR is implemented.

Pr(B > Btar)

Year	HCR0	HCR1
2021	0.000	0.000
2022	0.000	0.000
2023	0.024	0.024
2024	0.282	0.396
2025	0.487	0.665
2026	0.554	0.710
2027	0.573	0.706
2028	0.567	0.633
2029	0.539	0.588
2030	0.518	0.575
2031	0.521	0.578
2032	0.566	0.618
2033	0.563	0.620

P(Kobe green)

Year	HCR0	HCR1
2021	0.000	0.000
2022	0.000	0.000
2023	0.024	0.024
2024	0.267	0.380
2025	0.393	0.539
2026	0.374	0.467
2027	0.343	0.396
2028	0.351	0.365
2029	0.319	0.348
2030	0.295	0.334
2031	0.334	0.372
2032	0.370	0.415

Pr(B < Blim)

Year	HCR0	HCR1
2021	1.000	1.000
2022	0.000	0.000
2023	0.000	0.000
2024	0.000	0.000
2025	0.000	0.000
2026	0.002	0.001
2027	0.001	0.000
2028	0.001	0.000
2029	0.000	0.002
2030	0.003	0.003
2031	0.002	0.001
2032	0.002	0.001
2033	0.003	0.001

Pr(F > Flim)

Year	HCR0	HCR1
2021	0.000	0.000
2022	0.000	0.000
2023	0.000	0.000
2024	0.023	0.008
2025	0.062	0.051
2026	0.109	0.119
2027	0.127	0.163
2028	0.138	0.168
2029	0.135	0.145
2030	0.140	0.142
2031	0.134	0.132
2032	0.127	0.123

TAC

Year	HCR0	HCR1
2021	92	92
2022	98	98
2023	205	103
2024	289	215
2025	368	364
2026	419	454
2027	446	481
2028	444	463
2029	439	438
2030	437	426
2031	428	413
2032	433	423

5. Implementation schedule

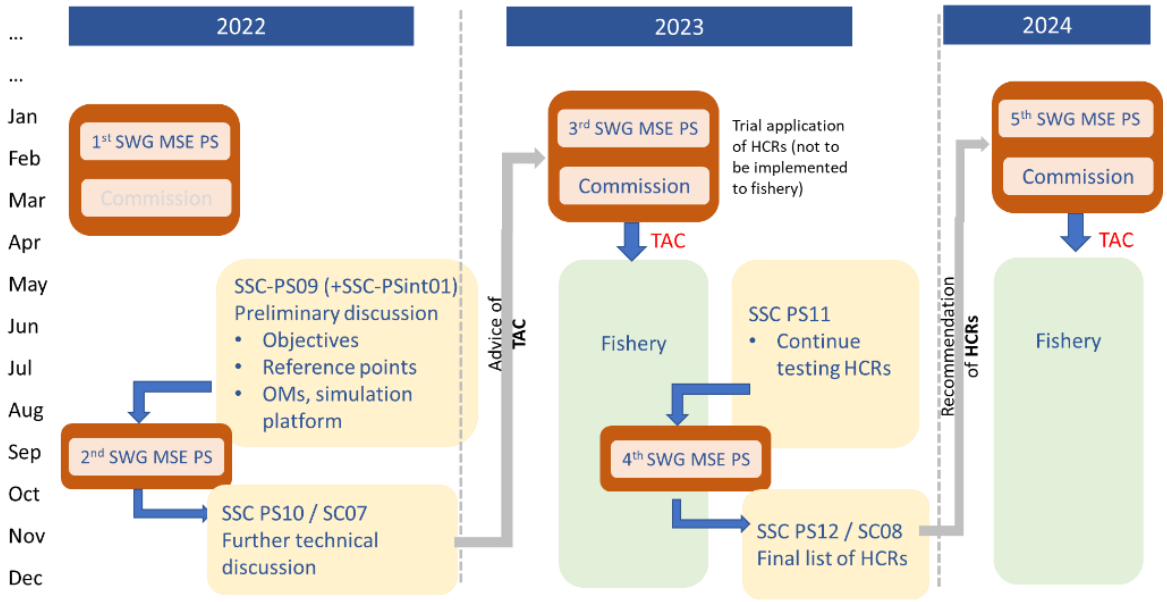


Figure 2. A planned implementation schedule.

Annex E

Timeline and tasks

Meeting	Date	Task	Format
COM07	Mar 22-24, 2023	• Review of management advice from SC • Review and endorsement of SWG MSE PS 01-03 reports	In-person (hybrid)
Intersessional technical work (under SSC PS)	May 30	• Start discussion on CPUE • Review other issues if ready	Virtual
Ditto	June 30	• Review progress on OMs including development of robustness scenarios • Review progress on evaluation of HCRs	Virtual
Ditto	July 27	• Review further progress on OMs • Review further progress on evaluation of HCRs	Virtual
SSC PS11	Aug 28-31	• Review standardized CPUE up to 2022 • Review Japanese survey estimates including 2023 • Review progress on new assessment models and finalize a set of models and specification • Review progress on HCR works • Conduct initial BSSPM analyses to see if there are any gaps between 2022 and 2023 assessments	In-person (hybrid)
SWG MSE PS04	Aug 31-Sep 2	• Review progress on HCR works • Finalize a set of OMs, management objectives and template of performance metrics and candidate HCRs • Capacity building	In-person (hybrid)
Intersessional technical work (under SSC PS)	Oct-Nov	• Review progress on tasks identified in SWG MSE PS 04	Virtual
SSC PS12	Dec 11-14	• Update BSSPM analyses and provide recommendations to 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) • Finalize technical works	In-person (hybrid)
SWG MSE PS05	Jan 18-20, 2024	• Select an HCR and make a recommendation to the Commission	In-person (hybrid)
COM08	Apr 15-18, 2024	• Adoption of CMM on HCR for PS?	In-person (hybrid)