Report of the 24th Session of the IPHC Scientific Review Board (SRB024)

Meeting held in Seattle, WA, USA, 18-20 June 2024

Commissioners

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Participants in the Session
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INTERNATIONAL PACIFIC HALIBUT COMMISSION

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ACRONYMS

AI	Artificial Intelligence	MSAB	Management Strategy Advisory Board
AM	Annual Meeting	MSE	Management Strategy Evaluation
FISS	Fishery-Independent Setline Survey	OM	Operating Model
IPHC	International Pacific Halibut Commission	SRB	Scientific Review Board
		TCEY	Total Constant Exploitation Yield
MP	Management Procedure	U.S.A.	United States of America

DEFINITIONS

A set of working definitions are provided in the IPHC Glossary of Terms and abbreviations: https://www.iphc.int/the-commission/glossary-of-terms-and-abbreviations

HOW TO INTERPRET TERMINOLOGY CONTAINED IN THIS REPORT

This report has been written using the following terms and associated definitions so as to remove ambiguity surrounding how particular paragraphs should be interpreted.

Level 1: **RECOMMENDED**; **RECOMMENDATION; ADOPTED** (formal); **REQUESTED; ENDORSED; ACCEPTED** (informal): A conclusion for an action to be undertaken, by a Contracting Party, a subsidiary (advisory) body of the Commission and/or the IPHC Secretariat.

Level 2: **AGREED**: Any point of discussion from a meeting which the Commission considers to be an agreed course of action covered by its mandate, which has not already been dealt with under Level 1 above; a general point of agreement among delegations/participants of a meeting which does not need to be elevated in the Commission's reporting structure.

Level 3: **NOTED/NOTING**; **CONSIDERED**; **URGED**; **ACKNOWLEDGED**: General terms to be used for consistency. Any point of discussion from a meeting which the Commission considers to be important enough to record in a meeting report for future reference. Any other term may be used to highlight to the reader of an IPHC report, the importance of the relevant paragraph. Other terms may be used but will be considered for explanatory/informational purposes only and shall have no higher rating within the reporting terminology hierarchy than Level 3.

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EXECUTIVE SUMMARY

The 24th Session of the International Pacific Halibut Commission (IPHC) Scientific Review Board (SRB024) was held in Seattle, WA, USA from 18 to 20 June 2024. The meeting was opened by the Chairperson, Dr Sean Cox (Canada), and the Executive Director, Dr David Wilson.

The following are a subset of the complete recommendations/requests for action from the SRB024, which are provided in full at Appendix IV.

RECOMMENDATIONS

Management strategy evaluation

SRB024–Rec.01 (para. 19) The SRB **NOTED** that the MSE is designed to address the concerns expressed by both the Canadian and USA science advisors and **RECOMMENDED** that the Commission develop a timeline for adopting a MP so that realistic answers to such concerns can be provided.

SRB024–Rec.02 (para. 20) The SRB **RECOMMENDED** a separate meeting between the SRB and Commissioners to clarify the intended use of the MSE and possible processes for adopting a formal MP.

SRB024–Rec.03 (para. 22) The SRB **RECOMMENDED** that the Commission develop a more specific and quantifiable catch objective to replace Objective c) (from AM099–Rec.02) "*Optimize average coastwide TCEY*".

> AM099–Rec.02 (para. 76). *The Commission RECOMMENDED that for the purpose of a comprehensive and intelligible Harvest Strategy Policy (HSP), four coastwide objectives should be documented within the HSP, in priority order:*
>
> a) Maintain the long-term coastwide female spawning stock biomass above a biomass limit reference point (B20%) at least 95% of the time.
>
> b) Maintain the long-term coastwide female spawning stock biomass at or above a biomass reference point (B36%) 50% or more of the time.
>
> c) Optimise average coastwide TCEY.
>
> d) Limit annual changes in the coastwide TCEY.

SRB024–Rec.04 (para. 23) The SRB **RECOMMENDED** that the Commission consider revising Objective b) (from AM099–Rec.02) "*Maintain the long-term coastwide female spawning stock biomass at or above a biomass reference point (B36%) 50% or more of the time*" to utilise a lower percentile than the 50th (median) to reflect concerns associated with the implications of low CPUE for the fishery at the 36% target for relative spawning biomass. A lower percentile better captures the role of uncertainty in this performance measure.

SRB024–Rec.05 (para. 24) **NOTING** that the Operating Model (OM) requires a distribution of harvest across the IPHC Regulatory Areas even though distribution of the TCEY is not a recommended part of the MP, the SRB **RECOMMENDED** capturing uncertainty in future TCEY distribution via the approach described in IPHC-2024-SRB024-07, where the TCEY is distributed similar to what is done annually as part of the decision table construction process in the stock assessment.

SRB024–Rec.06 (para. 25) **RECALLING** paper IPHC-2024-SRB024-03, Appendix A, SRB023-Rec.08 (para. 27), the SRB **RECOMMENDED**:

a) removing "exceptional circumstance" item c because the expected timeline of stock assessments and OM updates will automatically revise biological parameters and processes;

b) removing "exceptional circumstance" item b because:

- even though the operating model is an adequate representation of the coastwide dynamics and is useful for development of a coastwide MP, additional work on the regional stock dynamics needs to be done to improve correspondence with regional observations;
- improving estimation of regional stock dynamics is a longer-term project that the Secretariat will continue to work on with input from the SRB;
- as per paragraph 21, the SRB suggests that the annual TCEY distribution should not be included in a MP.

1. OPENING OF THE SESSION

1. The 24th Session of the International Pacific Halibut Commission (IPHC) Scientific Review Board (SRB024) was held in Seattle, WA, USA from 18 to 20 June 2024, and was open to online observer participation. The list of participants is provided at Appendix I. The meeting was opened by the Chairperson, Dr Sean Cox (Canada), and the Executive Director, Dr David Wilson.

2. The SRB **RECALLED** its mandate, as detailed in Appendix VIII, Sect. I, para. 1-3 of the IPHC Rules of Procedure (2024):

    1. *The Scientific Review Board (SRB) shall provide an independent scientific peer review of Commission science/research proposals, programs, and products, including but not limited to:*
        a. *Data collection;*
        b. *Historical data sets;*
        c. *Stock assessment;*
        d. *Management Strategy Evaluation;*
        e. *Migration;*
        f. *Reproduction;*
        g. *Growth;*
        h. *Discard survival;*
        i. *Genetics and Genomics.*
    2. *Undertake periodic reviews of science/research strategy, progress, and overall performance.*
    3. *Review the recommendations arising from the MSAB and the RAB.*

2. ADOPTION OF THE AGENDA AND ARRANGEMENTS FOR THE SESSION

3. The SRB **ADOPTED** the Agenda as provided at Appendix II. The documents provided to the SRB are listed in Appendix III. Participants were reminded that in accordance with the IPHC Rules of Procedure (2024), all documents and presentations for the meeting were published on the IPHC website 30 days and 10 days prior to the Session, respectively: https://www.iphc.int/meetings/24th-session-of-the-iphc-scientific-review-board-srb024/.

3. IPHC PROCESS

3.1 SRB annual workflow

4. **NOTING** that the core purpose of the SRB024 is to review progress on the IPHC's research and monitoring activities, and to provide guidance for the delivery of products to the SRB025 in September 2024, the SRB **RECALLED** that formal recommendations to the Commission would not necessarily be developed at the present meeting, but rather, these would be developed and finalised at SRB025.

3.2 Update on the actions arising from the 23rd Session of the SRB (SRB023)

5. The SRB **NOTED** paper IPHC-2024-SRB024-03 that provided the SRB with an opportunity to consider the progress made during the intersessional period on the recommendations/requests arising from the SRB023.

6. The SRB **AGREED** to consider and revise the actions as necessary, and to combine them with any new actions arising from SRB024 into a consolidated list for future reporting.

3.3 Outcomes of the 100th Session of the IPHC Annual Meeting (AM100)

7. The SRB **NOTED** paper IPHC-2023-SRB023-04 that detailed the outcomes of the 100th Session of the IPHC Annual Meeting (AM100), relevant to the mandate of the SRB, and **AGREED** to consider how best to provide the Commission with the information it has requested, throughout the course of the current SRB meeting.

8. **NOTING** that at the 100th Session of the IPHC, the Commission adopted a Statement on Climate Change, that is available on the IPHC website: IPHC-2024-PP-05, the SRB **AGREED** to consider and advise on the potential implications of climate change for the conservation and management of Pacific halibut, and any related impacts on the Contracting Parties.

3.4 Observer updates

9. The SRB **NOTED** the following updates (paraphrased) from the Canadian science advisor:

   a) ***Management Strategy Evaluation (MSE)****: Commissioners may continue to make decisions that do not precisely match what would come from a formal management procedure and, therefore asked about the implications of using the MSE outcomes to define a management space rather than adhering to a specific management procedure.*

   b) ***Fishery-Independent Setline Survey (FISS)****: How to balance data and assessment needs with financial constraints over the longer term?*

10. The SRB **NOTED** the following updates (paraphrased) from the USA science advisor:

    a) ***Fishery-Independent Setline Survey (FISS)****: USA commissioners expressed concern about whether the reduced FISS design with less frequent sampling in some areas would increase uncertainty and require more precautionary management. Requested that the SRB advise on how to guide the FISS design under a more austere budget?*

4. INTERNATIONAL PACIFIC HALIBUT COMMISSION 5-YEAR PROGRAM OF INTEGRATED RESEARCH AND MONITORING (2022-26)

11. The SRB **NOTED** paper IPHC-2024-SRB024-05, that provided the SRB with the IPHC 5-year Program of Integrated Research and Monitoring (2022-26), including a research tracking tool.

12. The SRB **RECALLED** that:

    a) the IPHC Secretariat conducts activities to address key issues identified by the Commission, its subsidiary bodies, the broader stakeholder community, and the IPHC Secretariat;

    b) the process of identifying, developing, and implementing the IPHC's science-based activities involves several steps that are circular and iterative in nature, but result in clear project activities and associated deliverables;

    c) the process includes developing and proposing projects based on direct input from the Commission, the experience of the IPHC Secretariat given its broad understanding of the resource and its associated fisheries, and concurrent consideration by relevant IPHC subsidiary bodies (including the SRB), and where deemed necessary, including by the Commission, additional external peer review;

    d) the IPHC Secretariat commenced implementation of the new Plan in 2022 and will keep the Plan under review on an ongoing basis.

13. The SRB **RECALLED** that an overarching goal of the IPHC 5-year Program of Integrated Research and Monitoring (2022-26) is to promote integration and synergies among the various research and monitoring activities of the IPHC Secretariat in order to improve knowledge of key inputs into the Pacific halibut stock

assessment, and Management Strategy Evaluation (MSE) processes, thereby providing the best possible advice for management decision making processes.

14. The SRB **REQUESTED** that the IPHC 5-year Program of Integrated Research and Monitoring be revised by SRB026 to reflect changing priorities in light of major progress on biological research and ongoing monitoring challenges.

4.1 Research

4.1.1 Pacific halibut stock assessment

15. The SRB **NOTED** paper IPHC-2024-SRB024-08, that provided a response to recommendations and requests made during SRB023 (IPHC-2023-SRB023-R) and to provide an update on the 2024 stock assessment development.

16. The SRB **NOTED** that the assessment model "self-test" represents an important first step in a broader simulation testing process and that the scenarios are well scoped and address relevant questions regarding the impact of uncertainty and bias in the FISS on assessment advice.

4.1.2 Management strategy evaluation

17. The SRB **NOTED** paper IPHC-2024-SRB024-07 that provided an update on Management Strategy Evaluation (MSE) progress and an MSE program of work for 2024.

18. The SRB **NOTED** the difficulty for the SRB or the Secretariat to provide advice on either of the science advisor issues raised without a formal management procedure (MP) or a clear process and objectives.

19. The SRB **NOTED** that the MSE is designed to address the concerns expressed by both the Canadian and USA science advisors and **RECOMMENDED** that the Commission develop a timeline for adopting a MP so that realistic answers to such concerns can be provided.

20. The SRB **RECOMMENDED** a separate meeting between the SRB and Commissioners to clarify the intended use of the MSE and possible processes for adopting a formal MP.

21. The SRB **AGREED** with revising the harvest strategy policy (HSP) to separate determination of the coastwide TCEY and distribution among regulatory areas, where TCEY is determined via a formal MP and distribution is decided annually by the Commission.

22. The SRB **RECOMMENDED** that the Commission develop a more specific and quantifiable catch objective to replace Objective c) (from AM099–Rec.02) "*Optimize average coastwide TCEY*".

> AM099–Rec.02 (para. 76). *The Commission RECOMMENDED that for the purpose of a comprehensive and intelligible Harvest Strategy Policy (HSP), four coastwide objectives should be documented within the HSP, in priority order:*
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>
> c) Optimise average coastwide TCEY.
>
> d) Limit annual changes in the coastwide TCEY.

23. The SRB **RECOMMENDED** that the Commission consider revising Objective b) (from AM099–Rec.02) "*Maintain the long-term coastwide female spawning stock biomass at or above a biomass reference point (B36%) 50% or more of the time*" to utilise a lower percentile than the 50th (median) to reflect concerns

associated with the implications of low CPUE for the fishery at the 36% target for relative spawning biomass. A lower percentile better captures the role of uncertainty in this performance measure.

24. **NOTING** that the Operating Model (OM) requires a distribution of harvest across the IPHC Regulatory Areas even though distribution of the TCEY is not a recommended part of the MP, the SRB **RECOMMENDED** capturing uncertainty in future TCEY distribution via the approach described in IPHC-2024-SRB024-07, where the TCEY is distributed similar to what is done annually as part of the decision table construction process in the stock assessment.

25. **RECALLING** paper IPHC-2024-SRB024-03, Appendix A, SRB023-Rec.08 (para. 27), the SRB **RECOMMENDED**:

    a) removing "exceptional circumstance" item c because the expected timeline of stock assessments and OM updates will automatically revise biological parameters and processes;

    b) removing "exceptional circumstance" item b because:

    - even though the operating model is an adequate representation of the coastwide dynamics and is useful for development of a coastwide MP, additional work on the regional stock dynamics needs to be done to improve correspondence with regional observations;
    - improving estimation of regional stock dynamics is a longer-term project that the Secretariat will continue to work on with input from the SRB;
    - as per paragraph 21, the SRB suggests that the annual TCEY distribution should not be included in a MP.

4.1.3 Biology and ecology

26. The SRB **NOTED** paper IPHC-2024-SRB024-09 that provided a description of progress towards research activities described in the IPHC's 5-Year Program of Integrated Research and Monitoring (2022-2026).

27. The SRB **NOTED** the successful proposal to Alaska Sea Grant for development of genetic-based aging methods and **REQUESTED** that the Secretariat articulate how these methods address specific priorities for the stock assessment and/or MSE or other IPHC goals.

28. The SRB **RECOMMENDED** that the Secretariat examine the relationship between blood markers of stress and recapture category (recaptured vs. still at large) to determine whether blood markers may be predictive of recreational charter sector discard mortality.

29. The SRB **NOTED** the analysis of depensation presented in paper IPHC-2024-SRB024-07, and **RECOMMENDED**:

    a) fitting a depensatory stock-recruitment model to estimate the depensation parameter value;

    b) operating model stress tests in the MSE with and without depensation across a range of plausible fishing intensities.

30. The SRB **NOTED** the Secretariat's studies of Pacific halibut stock structure based on genomics are nearing completion and suggest very limited genetic differentiation among individuals across the northeast Pacific and **RECOMMENDED** that:

    a) the Secretariat test for stock structure using only male Pacific halibut;

    b) the Secretariat prepare a manuscript for submission to a peer-reviewed scientific journal;

c) subject to the results from recommendation a (above), revise the 5-Year Program of Integrated Research and Monitoring to deprioritize stock structure studies as well as consideration of separate assessments of different stock components.

31. The SRB **NOTED** the preliminary results on the regional and coastwide maturity schedules using samples collected during the 2022 FISS and **RECOMMENDED** that the Secretariat continue similar analyses with samples from the reduced 2023 FISS to evaluate possible temporal patterns in maturity schedules.

4.2 Monitoring

4.2.1 Fishery-dependent data

Nil.

4.2.2 Fishery-independent data

4.2.2.1 2025 FISS design evaluation

32. The SRB **NOTED** paper IPHC-2024-SRB024-06 that proposed designs for the IPHC's Fishery-Independent Setline Survey (FISS) for the 2025-27 period, along with 2025 design options accounting for the FISS objective of long-term revenue neutrality.

33. The SRB **NOTED** the full FISS sampling grid of 1,890 stations from which an optimal subset of stations can be selected when devising annual FISS designs. In the Bering Sea, the full FISS design does not provide complete spatial coverage, and FISS data are augmented with calibrated data from domestic (NOAA-Fisheries and Alaska Department of Fish and Game (ADFG)) trawl surveys.

34. The SRB **NOTED** that the alternative FISS designs generate specific operating costs but also provide different economic impacts in mitigating risk of losses and instability in TCEY due to errors in decision-making and that such value is not reflected in standard presentations of alternative FISS design costs.

35. The SRB **REQUESTED** that the Secretariat present preliminary (at SRB025) and final (at SRB026) results of MSE runs with different FISS designs to better understand the actual net cost of the survey after accounting for potential reductions in TCEY associated with the increased uncertainty from reduced FISS designs.

36. The SRB **NOTED** that the analysis requested in paragraph 35 directly addresses the question presented by the USA science advisor (para. 10).

37. The SRB **RECOMMENDED** that the FISS analysis estimate a "vessel captain station" offset or scalar to estimate the average difference in catch rates of these non-randomly selected stations from those for standard grid stations.

38. The SRB **NOTED** the apparent contradiction between the Commission's newly adopted statement on climate change (IPHC-2024-PP-05) and the pressure to reduce capacity for population abundance and environmental monitoring in the FISS associated with funding shortfalls.

4.2.2.2 Updates to space-time modelling

39. The SRB **NOTED** the Secretariat's thorough evaluation of the potential benefit of using the Tweedie distribution in the space-time model and **RECOMMENDED** not incorporating this distribution into the model unless the cross-validation statistics support its use.

4.2.3 Age composition data (both fishery-dependent and fishery-independent)

40. The SRB **NOTED** paper IPHC-2024-SRB024-INF01 that provided the SRB with background in support of developing a protocol for creating a database of pictures with expert-provided labels for ageing use, in addition

to proposing a process for developing the necessary artificial intelligence (AI) services for supplementing current Pacific halibut ageing protocol.

41. The SRB **NOTED** that the IPHC is investigating AI solutions for determining the age of Pacific halibut from otolith images. The IPHC is in the process of creating a database comprising images with expert-provided labels for aging use. This database has been utilised to train and test a Convolutional Neural Network (CNN) model, a type of deep learning application renowned for its efficacy in image classification tasks.

42. The SRB **RECOMMENDED** that the Secretariat investigate:

    a) Fitting a power function to the AI/CNN vs manual age determination to show how bias increases with age;

    b) Training the model with more otoliths from older age classes;

    c) Alternative objective functions that put more weight on correctly estimating ages of older individuals;

    d) The importance of different aspects of aging accuracy/bias on the stock assessment.

5. MANAGEMENT SUPPORTING INFORMATION

43. The SRB **REQUESTED** that the Secretariat integrate FISS design considerations into the annual MSE workplan and 5-Year Program of Integrated Research and Monitoring to better quantify the value provided by the FISS.

6. REVIEW OF THE DRAFT AND ADOPTION OF THE REPORT OF THE 24TH SESSION OF THE IPHC SCIENTIFIC REVIEW BOARD (SRB024)

44. The Report of the 24th Session of the IPHC Scientific Review Board (IPHC-2024-SRB024-R) was **ADOPTED** on 20 June 2024, including the consolidated set of recommendations and/or requests arising from SRB024, provided at Appendix IV.

APPENDIX I
LIST OF PARTICIPANTS FOR THE 24TH SESSION OF THE IPHC SCIENTIFIC REVIEW BOARD (SRB024)

SRB Members

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APPENDIX II
AGENDA FOR THE 24TH SESSION OF THE IPHC SCIENTIFIC REVIEW BOARD (SRB024)

Date: 18-20 June 2024
Location: Seattle, WA, USA, & Remote Meeting
Venue: IPHC HQ & Adobe Connect
Time: 09:00-17:00 (18-19th), 09:00-12:00 (20th) PDT
Chairperson: Dr Sean Cox (Simon Fraser University)
Vice-Chairperson: Nil

1. OPENING OF THE SESSION

2. ADOPTION OF THE AGENDA AND ARRANGEMENTS FOR THE SESSION

3. IPHC PROCESS

3.1. SRB annual workflow (D. Wilson)
3.2. Update on the actions arising from the 23rd Session of the SRB (SRB023) (D. Wilson)
3.3. Outcomes of the 100th Session of the IPHC Annual Meeting (AM100) (D. Wilson)
3.4. Observer updates (e.g. Science Advisors)

4. INTERNATIONAL PACIFIC HALIBUT COMMISSION 5-YEAR PROGRAM OF INTEGRATED RESEARCH AND MONITORING (2022-26)

4.1. RESEARCH

4.1.1. Pacific halibut stock assessment
4.1.2. Management strategy evaluation
4.1.3. Biology and ecology

4.2. MONITORING

4.2.1. Fishery-dependent data
4.2.2. Fishery-independent data
- IPHC Fishery-Independent Setline Survey (FISS)
  - 2024 FISS design evaluation (R. Webster)
  - Updates to space-time modelling (R. Webster)

4.2.3. Age composition data (both fishery-dependent and fishery-independent)

5. MANAGEMENT SUPPORTING INFORMATION

6. REVIEW OF THE DRAFT AND ADOPTION OF THE REPORT OF THE 24th SESSION OF THE IPHC SCIENTIFIC REVIEW BOARD (SRB024)

APPENDIX III
LIST OF DOCUMENTS FOR THE 24TH SESSION OF THE IPHC SCIENTIFIC REVIEW BOARD (SRB024)

Document	Title	Availability
IPHC-2024-SRB024-01	Agenda & Schedule for the 24th Session of the Scientific Review Board (SRB024)	✓ 26 Mar 2024 ✓ 22 Apr 2024 ✓ 21 May 2024
IPHC-2024-SRB024-02	List of Documents for the 24th Session of the Scientific Review Board (SRB024)	✓ 26 Mar 2024 ✓ 22 Apr 2024 ✓ 21 May 2024
IPHC-2024-SRB024-03	Update on the actions arising from the 23rd Session of the SRB (SRB023) (IPHC Secretariat)	✓ 17 May 2024
IPHC-2024-SRB024-04	Outcomes of the 100th Session of the IPHC Annual Meeting (AM100) (D. Wilson)	✓ 17 May 2024
IPHC-2024-SRB024-05	International Pacific Halibut Commission 5-Year program of integrated research and monitoring (2022-26) (D. Wilson, J. Planas, I. Stewart, A. Hicks, R. Webster, & B. Hutniczak)	✓ 17 May 2024
IPHC-2024-SRB024-06	2025-27 FISS design evaluation (R. Webster)	✓ 17 May 2024
IPHC-2024-SRB024-07	IPHC Secretariat MSE Program of Work (2024) and an update on progress (A. Hicks & I. Stewart)	✓ 17 May 2024
IPHC-2024-SRB024-08	Development of the 2024 Pacific halibut (*Hippoglossus stenolepis*) stock assessment (I. Stewart & A. Hicks)	✓ 15 May 2024
IPHC-2024-SRB024-09	Report on current and future biological and ecosystem science research activities (J. Planas)	✓ 15 May 2024
Information papers		
IPHC-2024-SRB024-INF01	Using artificial intelligence (AI) for supplementing Pacific halibut age determination from collected otoliths (B. Hutniczak, J. Forsberg, K. Sawyer Van Vleck, & K. Magrane)	✓ 21 May 2024

APPENDIX IV
CONSOLIDATED SET OF RECOMMENDATIONS AND REQUESTS OF THE 24TH SESSION OF THE IPHC SCIENTIFIC REVIEW BOARD (SRB024)

RECOMMENDATIONS

Management strategy evaluation

SRB024–Rec.01 (para. 19) The SRB **NOTED** that the MSE is designed to address the concerns expressed by both the Canadian and USA science advisors and **RECOMMENDED** that the Commission develop a timeline for adopting a MP so that realistic answers to such concerns can be provided.

SRB024–Rec.02 (para. 20) The SRB **RECOMMENDED** a separate meeting between the SRB and Commissioners to clarify the intended use of the MSE and possible processes for adopting a formal MP.

SRB024–Rec.03 (para. 22) The SRB **RECOMMENDED** that the Commission develop a more specific and quantifiable catch objective to replace Objective c) (from AM099–Rec.02) "*Optimize average coastwide TCEY*".

> AM099–Rec.02 (para. 76). *The Commission RECOMMENDED that for the purpose of a comprehensive and intelligible Harvest Strategy Policy (HSP), four coastwide objectives should be documented within the HSP, in priority order:*
>
> a) Maintain the long-term coastwide female spawning stock biomass above a biomass limit reference point (B20%) at least 95% of the time.
>
> b) Maintain the long-term coastwide female spawning stock biomass at or above a biomass reference point (B36%) 50% or more of the time.
>
> c) Optimise average coastwide TCEY.
>
> d) Limit annual changes in the coastwide TCEY.

SRB024–Rec.04 (para. 23) The SRB **RECOMMENDED** that the Commission consider revising Objective b) (from AM099–Rec.02) "*Maintain the long-term coastwide female spawning stock biomass at or above a biomass reference point (B36%) 50% or more of the time*" to utilise a lower percentile than the 50th (median) to reflect concerns associated with the implications of low CPUE for the fishery at the 36% target for relative spawning biomass. A lower percentile better captures the role of uncertainty in this performance measure.

SRB024–Rec.05 (para. 24) **NOTING** that the Operating Model (OM) requires a distribution of harvest across the IPHC Regulatory Areas even though distribution of the TCEY is not a recommended part of the MP, the SRB **RECOMMENDED** capturing uncertainty in future TCEY distribution via the approach described in IPHC-2024-SRB024-07, where the TCEY is distributed similar to what is done annually as part of the decision table construction process in the stock assessment.

SRB024–Rec.06 (para. 25) **RECALLING** paper IPHC-2024-SRB024-03, Appendix A, SRB023-Rec.08 (para. 27), the SRB **RECOMMENDED**:

a) removing "exceptional circumstance" item c because the expected timeline of stock assessments and OM updates will automatically revise biological parameters and processes;

b) removing "exceptional circumstance" item b because:

- even though the operating model is an adequate representation of the coastwide dynamics and is useful for development of a coastwide MP, additional work on the regional stock dynamics needs to be done to improve correspondence with regional observations;
- improving estimation of regional stock dynamics is a longer-term project that the Secretariat will continue to work on with input from the SRB;
- as per paragraph 21, the SRB suggests that the annual TCEY distribution should not be included in a MP.

Biology and ecology

SRB024–Rec.07 (para. 28) The SRB **RECOMMENDED** that the Secretariat examine the relationship between blood markers of stress and recapture category (recaptured vs. still at large) to determine whether blood markers may be predictive of recreational charter sector discard mortality.

SRB024–Rec.08 (para. 29) The SRB **NOTED** the analysis of depensation presented in paper IPHC-2024-SRB024-07, and **RECOMMENDED**:

a) fitting a depensatory stock-recruitment model to estimate the depensation parameter value;

b) operating model stress tests in the MSE with and without depensation across a range of plausible fishing intensities.

SRB024–Rec.09 (para. 30) The SRB **NOTED** the Secretariat's studies of Pacific halibut stock structure based on genomics are nearing completion and suggest very limited genetic differentiation among individuals across the northeast Pacific and **RECOMMENDED** that:

a) the Secretariat test for stock structure using only male Pacific halibut;

b) the Secretariat prepare a manuscript for submission to a peer-reviewed scientific journal;

c) subject to the results from recommendation a (above), revise the 5-Year Program of Integrated Research and Monitoring to deprioritize stock structure studies as well as consideration of separate assessments of different stock components.

SRB024–Rec.10 (para. 31) The SRB **NOTED** the preliminary results on the regional and coastwide maturity schedules using samples collected during the 2022 FISS and **RECOMMENDED** that the Secretariat continue similar analyses with samples from the reduced 2023 FISS to evaluate possible temporal patterns in maturity schedules.

2025 FISS design evaluation

SRB024–Rec.11 (para. 37) The SRB **RECOMMENDED** that the FISS analysis estimate a "vessel captain station" offset or scalar to estimate the average difference in catch rates of these non-randomly selected stations from those for standard grid stations.

Updates to space-time modelling

SRB024–Rec.12 (para. 39) The SRB **NOTED** the Secretariat's thorough evaluation of the potential benefit of using the Tweedie distribution in the space-time model and **RECOMMENDED** not incorporating this distribution into the model unless the cross-validation statistics support its use.

Age composition data (both fishery-dependent and fishery-independent)

SRB024–Rec.13 (para. 42) The SRB **RECOMMENDED** that the Secretariat investigate:

a) Fitting a power function to the AI/CNN vs manual age determination to show how bias increases with age;

b) Training the model with more otoliths from older age classes;

c) Alternative objective functions that put more weight on correctly estimating ages of older individuals;

d) The importance of different aspects of aging accuracy/bias on the stock assessment.

REQUESTS

International Pacific Halibut Commission 5-year program of integrated research and monitoring (2022-26)

SRB024–Req.01 (para. 14) The SRB **REQUESTED** that the IPHC 5-year Program of Integrated Research and Monitoring be revised by SRB026 to reflect changing priorities in light of major progress on biological research and ongoing monitoring challenges.

Biology and ecology

SRB024–Req.02 (para. 27) The SRB **NOTED** the successful proposal to Alaska Sea Grant for development of genetic-based aging methods and **REQUESTED** that the Secretariat articulate how these methods address specific priorities for the stock assessment and/or MSE or other IPHC goals.

2025 FISS design evaluation

SRB024–Req.03 (para. 35) The SRB **REQUESTED** that the Secretariat present preliminary (at SRB025) and final (at SRB026) results of MSE runs with different FISS designs to better understand the actual net cost of the survey after accounting for potential reductions in TCEY associated with the increased uncertainty from reduced FISS designs.

Management Supporting Information

SRB024–Req.04 (para. 43) The SRB **REQUESTED** that the Secretariat integrate FISS design considerations into the annual MSE workplan and 5-Year Program of Integrated Research and Monitoring to better quantify the value provided by the FISS.