



## Report of the 28<sup>th</sup> Session of the IPHC Scientific Review Board (SRB028)

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Meeting held in Seattle, WA, USA, 19-21 May 2026

### Commissioners

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## ACRONYMS

AI	Artificial Intelligence	IRMP	Integrated Research and Monitoring Plan
AM	Annual Meeting		
FISS	Fishery-Independent Setline Survey	MSAB	Management Strategy Advisory Board
IPHC	International Pacific Halibut Commission	MSE	Management Strategy Evaluation
		SRB	Scientific Review Board
		USA	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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**TABLE OF CONTENTS**

**REPORT OF THE 28<sup>TH</sup> SESSION OF THE IPHC SCIENTIFIC REVIEW BOARD (SRB028) ..... 1**

**TABLE OF CONTENTS..... 4**

**EXECUTIVE SUMMARY ..... 5**

**1. OPENING OF THE SESSION ..... 7**

**2. ADOPTION OF THE AGENDA AND ARRANGEMENTS FOR THE SESSION ..... 7**

**3. IPHC PROCESS..... 7**

    3.1 *SRB annual workflow*..... 7

    3.2 *Update on the actions arising from the 27<sup>th</sup> Session of the SRB (SRB027)*..... 8

    3.3 *Outcomes of the 102<sup>nd</sup> Session of the IPHC Annual Meeting (AM102)* ..... 8

    3.4 *Observer updates* ..... 8

**4. INTERNATIONAL PACIFIC HALIBUT COMMISSION INTEGRATED RESEARCH AND MONITORING PLAN ..... 8**

    4.1 *Research*..... 8

        4.1.1 *Biology and ecology* ..... 8

        4.1.2 *Pacific halibut stock assessment* ..... 9

        4.1.3 *Management strategy evaluation*..... 9

    4.2 *Monitoring* ..... 10

        4.2.1 *Fishery-dependent data* ..... 10

        4.2.2 *Fishery-independent data* ..... 10

            4.2.2.1 *2027 FISS design evaluation*..... 10

            4.2.2.2 *Updates to space-time modelling*..... 10

        4.2.3 *Age composition data (both fishery-dependent and fishery-independent)* ..... 10

**5. OTHER BUSINESS..... 10**

**6. REVIEW OF THE DRAFT AND ADOPTION OF THE REPORT OF THE 28<sup>TH</sup> SESSION OF THE IPHC SCIENTIFIC REVIEW BOARD (SRB028) ..... 10**

**APPENDIX I LIST OF PARTICIPANTS FOR THE 28<sup>TH</sup> SESSION OF THE IPHC SCIENTIFIC REVIEW BOARD (SRB028) ... 11**

**APPENDIX II AGENDA FOR THE 28<sup>TH</sup> SESSION OF THE IPHC SCIENTIFIC REVIEW BOARD (SRB028) ..... 13**

**APPENDIX III LIST OF DOCUMENTS FOR THE 28<sup>TH</sup> SESSION OF THE IPHC SCIENTIFIC REVIEW BOARD (SRB028)... 14**

**APPENDIX IV CONSOLIDATED SET OF RECOMMENDATIONS AND REQUESTS OF THE 28<sup>TH</sup> SESSION OF THE IPHC SCIENTIFIC REVIEW BOARD (SRB028) ..... 15**



## EXECUTIVE SUMMARY

The 28<sup>th</sup> Session of the International Pacific Halibut Commission (IPHC) Scientific Review Board (SRB028) was held in Seattle, WA, USA, from 19 to 21 May 2026. The Executive Director, Dr David Wilson, opened the meeting, noting that the SRB was yet to elect a new Chairperson to replace Dr Sean Cox, who retired from the SRB in 2025. Dr Olaf Jensen (USA) was elected as Chairperson of the SRB.

The following are a subset of the complete recommendations/requests for action from the SRB028, which are provided in full at [Appendix IV](#).

## RECOMMENDATIONS

### *Management strategy evaluation*

SRB028–Rec.01 ([para. 27](#)) The SRB **NOTED** that a single control rule based on relative biomass is unlikely to reach the ramp (descending limb) where reduction in F are triggered. Therefore, the SRB **RECOMMENDED** investigating HCRs based on absolute biomass.

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

SRB028–Rec.02 ([para. 35](#)) **NOTING** that the Secretariat has developed multiple aging methods (epigenetic, AI-based, traditional break and burn otolith aging), the SRB **RECOMMENDED** that a table be developed – with a column for each method - describing:

- a) the different anticipated use cases;
- b) the relative costs (split into development and production) and benefits of these approaches;
- c) timelines for development; and
- d) decision points that will determine future allocation of effort to this method.

## REQUESTS

### *Biology and ecology*

SRB028–Req.01 ([para. 16](#)) The SRB **REQUESTED** an analysis that separates year and biological region effects on maturity ogives. This would answer whether variation in age at maturity is driven by variation in the spatial distribution of the stock or by interannual variation in environmental conditions.

SRB028–Req.02 ([para. 17](#)) The SRB **REQUESTED** that the Secretariat investigate:

- a) environmental predictors of interannual variation in maturity ogives; and
- b) the potential to include time-varying maturity ogives in the stock assessment.

SRB028–Req.03 ([para. 18](#)) The SRB **REQUESTED** that, as more epigenetic aging data become available, a more systematic approach to cross-validation be developed in which performance is evaluated across space and time. For example, applying a model trained on samples from all but one area to the withheld area and applying a model trained on samples from all but one year to the withheld year. Ideally, a full factorial approach could be used to determine whether any training-test combinations perform inadequately.



***Pacific halibut stock assessment***

SRB028-Req.04 ([para. 21](#)) **NOTING** the progress presented in [IPHC-2026-SRB028-07](#) on assembling a list of state space modelling platforms and their associated features, the SRB **REQUESTED** an update at SRB029 on progress to develop initial models, including approaches to mimic essential features of the Pacific halibut assessment (e.g. sex specific modelling) using other means (e.g. the spatial area features in multi-WHAM).

***Management strategy evaluation***

SRB028-Req.05 ([para. 23](#)) The SRB **REQUESTED** that the Secretariat investigate, via the MSE, control rules based on changes to the risk of overfishing (often referred to as  $p^*$ , see Shertzer et al. 2008<sup>1</sup>).

SRB028-Req.06 ([para. 25](#)) **RECALLING** that at SRB026, the SRB made the following recommendation, [IPHC-2025-SRB026-R](#), SRB026-Rec.07 (para. 24) “*The SRB RECOMMENDED that recruitment projections in the stock assessment and Management Strategy Evaluation (MSE) incorporate a random-walk starting from the most recent reliable recruitment estimate to constrain expected short-term recruitment around recent estimates rather than immediately reverting to the stock-recruitment relationship.*”

and **NOTING** the update provided by the Secretariat at SRB028, the SRB **REQUESTED** an analysis of projecting recruitment via projections in environmental drivers (Pacific Decadal Oscillation) in addition to autocorrelated recruitment, which tends to rapidly revert to the mean.

*The full recording of the SRB028 is available at the following link, under Meeting Outcomes: [IPHC-2026-SRB028-Audio recordings](#)*



## 1. OPENING OF THE SESSION

1. The 28<sup>th</sup> Session of the International Pacific Halibut Commission (IPHC) Scientific Review Board (SRB028) was held in a hybrid format, from 19 to 21 May 2026, and was open to online observer participation. The list of participants is provided at [Appendix I](#). The Executive Director, Dr David T. Wilson, opened the meeting and welcomed participants. Apologies were received from Dr Anna Kuparinen.

### 1.1 Election of a Chairperson

2. The SRB **NOTED** that the office of the Chairperson was currently vacant, following the retirement of Dr Sean Cox in 2025. In accordance with Appendix VIII, Rule III.7 of the [IPHC Rules of Procedure \(2025\)](#), the SRB is required to elect a new Chairperson.
3. The SRB called for nominations for the position of Chairperson of the SRB. Dr Olaf Jensen (USA) was nominated, seconded, and **ELECTED** as Chairperson.
4. The SRB **WELCOMED** two new board members: [Dr Michael Wilberg](#) (professor, University of Maryland Center for Environmental Science, USA) and [Dr Joanna Mills Flemming](#) (Professor, Dalhousie University, Canada).
5. The SRB **RECALLED** its mandate, as detailed in Appendix VIII, Sect. I, para. 1-3 of the [IPHC Rules of Procedure \(2025\)](#):
  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

6. 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 \(2025\)](#), 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/28th-session-of-the-iphc-scientific-review-board-srb028/>.

## 3. IPHC PROCESS

### 3.1 SRB annual workflow

7. **NOTING** that the core purpose of the SRB028 is to review progress on the IPHC's research and monitoring activities, and to provide guidance for the delivery of products to the SRB029 in September 2026, 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 SRB029.



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**3.2 Update on the actions arising from the 27<sup>th</sup> Session of the SRB (SRB027)**

8. The SRB **NOTED** paper [IPHC-20265-SRB028-03](#) that provided the SRB with an opportunity to consider the progress made during the intersessional period on the recommendations/requests arising from the SRB027.
9. The SRB **AGREED** to consider and revise the actions as necessary, and to combine them with any new actions arising from SRB028 into a consolidated list for future reporting.

**3.3 Outcomes of the 102<sup>nd</sup> Session of the IPHC Annual Meeting (AM102)**

10. The SRB **NOTED** paper [IPHC-2026-SRB028-04](#) that detailed the outcomes of the 102<sup>nd</sup> Session of the IPHC Annual Meeting (AM102), 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.

**3.4 Observer updates**

11. The SRB **NOTED** the following questions from the Canadian science advisor:
  - a) Harvest Strategy Policy: Are there examples of how "depleted" has been used elsewhere? How might this concept be implemented for Pacific halibut?
  - b) FISS design: At what point does reduced FISS sampling reach a breaking point beyond which the data are no longer sufficient for the stock assessment? Are there ways to improve the articulation of objectives for the FISS to match precision and accuracy to management needs?
12. The SRB **NOTED** the following updates from the USA science advisor:
  - a) Harvest Strategy Policy: There is an interest in better understanding how the "depleted" reference point can be used in management.

**4. INTERNATIONAL PACIFIC HALIBUT COMMISSION INTEGRATED RESEARCH AND MONITORING PLAN**

13. The SRB **NOTED** paper [IPHC-2026-SRB028-05](#), that provided the SRB with the IPHC Integrated Research and Monitoring Plan (IRMP) ([IPHC-2026-IRMP](#)) published on 17 March 2026, and iterative review and revision process moving forward.

**4.1 Research**

**4.1.1 Biology and ecology**

14. The SRB **NOTED** paper [IPHC-2026-SRB028-06](#) that provided a description of progress towards research activities described in the previous 5-Year Program of Integrated Research and Monitoring (2022-2026), and plans moving forward.
15. The SRB **NOTED** that the new maximum likelihood-based approach to estimation of Fst (genetic differentiation) developed by the Secretariat represents a significant improvement to existing methods, especially in terms of computational efficiency.
16. The SRB **REQUESTED** an analysis that separates year and biological region effects on maturity ogives. This would answer whether variation in age at maturity is driven by variation in the spatial distribution of the stock or by interannual variation in environmental conditions.
17. The SRB **REQUESTED** that the Secretariat investigate:
  - a) environmental predictors of interannual variation in maturity ogives; and
  - b) the potential to include time-varying maturity ogives in the stock assessment.



18. The SRB **REQUESTED** that, as more epigenetic aging data become available, a more systematic approach to cross-validation be developed in which performance is evaluated across space and time. For example, applying a model trained on samples from all but one area to the withheld area and applying a model trained on samples from all but one year to the withheld year. Ideally, a full factorial approach could be used to determine whether any training-test combinations perform inadequately.

#### 4.1.2 Pacific halibut stock assessment

19. The SRB **NOTED** paper [IPHC-2026-SRB028-07](#), that provided a response to recommendations and requests made during SRB027 ([IPHC-2026-SRB027-R](#)) and to provide an update on the 2026 stock assessment development.

20. The SRB **NOTED** that the receiver operating characteristic curves suggest that the stock assessment projections perform well in predicting significant declines (i.e. > 3%) in spawning stock biomass.

21. **NOTING** the progress presented in [IPHC-2026-SRB028-07](#) on assembling a list of state space modelling platforms and their associated features, the SRB **REQUESTED** an update at SRB029 on progress to develop initial models, including approaches to mimic essential features of the Pacific halibut assessment (e.g. sex specific modelling) using other means (e.g. the spatial area features in multi-WHAM).

#### 4.1.3 Management strategy evaluation

22. The SRB **NOTED** paper [IPHC-2026-SRB028-08 Rev 1](#) that provided the MSE Program of Work for 2026–2027, and an overview of work done since the SRB027, using the IPHC Management Strategy Evaluation (MSE) framework.

23. The SRB **REQUESTED** that the Secretariat investigate, via the MSE, control rules based on changes to the risk of overfishing (often referred to as  $p^*$ , see Shertzer et al. 2008<sup>1</sup>).

24. The SRB **NOTED** that there may be equivalence between tradition F-based HCRs and those based on risk of overfishing and it may be more efficient to map the risk-based HCR onto an F-based method instead of running them through the MSE separately.

25. **RECALLING** that at SRB026, the SRB made the following recommendation,

*[IPHC-2025-SRB026-R](#), SRB026–Rec.07 (para. 24) “The SRB RECOMMENDED that recruitment projections in the stock assessment and Management Strategy Evaluation (MSE) incorporate a random-walk starting from the most recent reliable recruitment estimate to constrain expected short-term recruitment around recent estimates rather than immediately reverting to the stock-recruitment relationship.”*

and **NOTING** the update provided by the Secretariat at SRB028, the SRB **REQUESTED** an analysis of projecting recruitment via projections in environmental drivers (Pacific Decadal Oscillation) in addition to autocorrelated recruitment, which tends to rapidly revert to the mean.

26. **RECALLING** that at SRB027, the SRB made the following recommendation,

*[IPHC-2025-SRB027-R](#), SRB027–Rec.07 (para. 22) “The SRB RECOMMENDED considering some fishery performance indicators that represent metrics directly observable by stakeholders, e.g. fishery CPUE.”*

the SRB **AGREED** that its intent was to have a wider variety of indicators that could be useful and observable to stakeholders – not to propose these indicators as objectives. The MSAB, which has diverse stakeholder representation, is better positioned than the SRB to evaluate the value of indicators.

<sup>1</sup>[Shertzer KW, Prager MH, and Williams EH \(2008\) A probability-based approach to setting annual catch levels. Fish. Bull. 106\(3\): 225-232](#)



27. The SRB **NOTED** that a single control rule based on relative biomass is unlikely to reach the ramp (descending limb) where reduction in F are triggered. Therefore, the SRB **RECOMMENDED** investigating HCRs based on absolute biomass.

#### 4.2 **Monitoring**

##### 4.2.1 **Fishery-dependent data**

28. Nil.

##### 4.2.2 **Fishery-independent data**

###### 4.2.2.1 **2027 FISS design evaluation**

29. The SRB **NOTED** paper [IPHC-2026-SRB028-09](#) that proposed designs for the IPHC's Fishery-Independent Setline Survey (FISS) for 2027-31, including a preliminary cost evaluation of the 2027 Base Block design.

30. The SRB **NOTED** the critical importance of the FISS as an input to the stock assessment and a platform for scientific research.

31. The SRB **NOTED** that a potential lack of sampling in IPHC Regulatory Area 4B in 2026 will result in higher CVs than those shown in the projections in [IPHC-2026-SRB028-09](#), the potential for increased bias, and a lack of biological information for this biological region.

32. The SRB **NOTED** that implementation of the Base Block design should, after a few years, result in a reduction in CVs at the level of regulatory areas that are within target ranges.

###### 4.2.2.2 **Updates to space-time modelling**

33. Nil

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

34. The SRB **NOTED** the improvements in aging accuracy from the AI-based otolith analysis.

35. **NOTING** that the Secretariat has developed multiple aging methods (epigenetic, AI-based, traditional break and burn otolith aging), the SRB **RECOMMENDED** that a table be developed – with a column for each method - describing:

- a) the different anticipated use cases;
- b) the relative costs (split into development and production) and benefits of these approaches;
- c) timelines for development; and
- d) decision points that will determine future allocation of effort to this method.

## 5. **OTHER BUSINESS**

36. The SRB **RECALLED** that the SRB029 would be held from 22-24 September 2026, in a hybrid format.

## 6. **REVIEW OF THE DRAFT AND ADOPTION OF THE REPORT OF THE 28<sup>TH</sup> SESSION OF THE IPHC SCIENTIFIC REVIEW BOARD (SRB028)**

37. The Report of the 28<sup>th</sup> Session of the IPHC Scientific Review Board ([IPHC-2026-SRB028-R](#)) was **ADOPTED** on 21 May 2026, including the consolidated set of recommendations and/or requests arising from SRB028, provided at [Appendix IV](#).



**APPENDIX I**  
**LIST OF PARTICIPANTS FOR THE 28<sup>TH</sup> SESSION OF THE**  
**IPHC SCIENTIFIC REVIEW BOARD (SRB028)**

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## APPENDIX II

### AGENDA FOR THE 28<sup>TH</sup> SESSION OF THE IPHC SCIENTIFIC REVIEW BOARD (SRB028)

**Date:** 19-21 May 2026

**Location:** Hybrid - Seattle, WA, USA & Electronic

**Venue:** IPHC HQ (for SRB and Science advisors only) & Adobe Connect (observers)

**Time:** 09:00-17:00 (19-20<sup>th</sup>), 09:00-12:00 (21<sup>st</sup>) PDT

**Chairperson:** Dr Olaf Jensen (USA)

1. **OPENING OF THE SESSION**
  - 1.1. Election of a Chairperson
2. **ADOPTION OF THE AGENDA AND ARRANGEMENTS FOR THE SESSION**
3. **IPHC PROCESS**
  - 3.1. SRB annual workflow
  - 3.2. Update on the actions arising from the 27<sup>th</sup> Session of the SRB (SRB027)
  - 3.3. Outcomes of the 102<sup>nd</sup> Session of the IPHC Annual Meeting (AM102)
  - 3.4. Observer updates (e.g. Science Advisors)
4. **INTERNATIONAL PACIFIC HALIBUT COMMISSION INTEGRATED RESEARCH AND MONITORING PLAN**
  - 4.1. **RESEARCH**
    - 4.1.1. Biology and ecology
    - 4.1.2. Pacific halibut stock assessment
    - 4.1.3. Management strategy evaluation
  - 4.2. **MONITORING**
    - 4.2.1. Fishery-dependent data
    - 4.2.2. Fishery-independent data
      - IPHC Fishery-Independent Setline Survey (FISS)
        - 2027 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. **OTHER BUSINESS**
6. **REVIEW OF THE DRAFT AND ADOPTION OF THE REPORT OF THE 28<sup>th</sup> SESSION OF THE IPHC SCIENTIFIC REVIEW BOARD (SRB028)**



**APPENDIX III**  
**LIST OF DOCUMENTS FOR THE 28<sup>TH</sup> SESSION OF THE**  
**IPHC SCIENTIFIC REVIEW BOARD (SRB028)**

<b>Document</b>	<b>Title</b>	<b>Availability</b>
IPHC-2026-SRB028-01	Agenda & Schedule for the 28 <sup>th</sup> Session of the Scientific Review Board (SRB028)	✓ 16 Dec 2025 ✓ 12 Mar 2026 ✓ 19 Apr 2026
IPHC-2026-SRB028-02	List of Documents for the 28 <sup>th</sup> Session of the Scientific Review Board (SRB028)	✓ 16 Dec 2025 ✓ 16 Apr 2026 ✓ 19 May 2026
IPHC-2026-SRB028-03	Update on the actions arising from the 27 <sup>th</sup> Session of the SRB (SRB027) (IPHC Secretariat)	✓ 16 Apr 2026
IPHC-2026-SRB028-04	Outcomes of the 102 <sup>nd</sup> Session of the IPHC Annual Meeting (AM102) (D. Wilson)	✓ 15 Apr 2026
IPHC-2026-SRB028-05	International Pacific Halibut Commission Integrated Research and Monitoring Plan (D. Wilson, J. Planas, I. Stewart, A. Hicks, R. Webster, & B. Hutniczak)	✓ 15 Apr 2026
IPHC-2026-SRB028-06	Report on current and future biological and ecosystem science research activities (J. Planas, C. Dykstra, A. Jasonowicz, & C. Jones)	✓ 15 Apr 2026
IPHC-2026-SRB028-07	Development of the 2026 Pacific halibut ( <i>Hippoglossus stenolepis</i> ) stock assessment (I. Stewart & A. Hicks)	✓ 15 Apr 2026
IPHC-2026-SRB028-08 Rev_1	An update of the IPHC Secretariat MSE Program of Work (A. Hicks & I. Stewart)	✓ 16 Apr 2026 ✓ 5 May 2026
IPHC-2026-SRB028-09	2027-31 FISS design evaluation (R. Webster, I. Stewart, K. Ualesi, T. Jack, & D. Wilson)	✓ 15 Apr 2026
<b><i>Information papers</i></b>		
IPHC-2026-SRB028-INF01	Using artificial intelligence (AI) for supplementing Pacific halibut age determination from collected otoliths - project update (B. Hutniczak)	✓ 8 May 2026



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APPENDIX IV

CONSOLIDATED SET OF RECOMMENDATIONS AND REQUESTS OF THE 28<sup>TH</sup> SESSION OF THE  
IPHC SCIENTIFIC REVIEW BOARD (SRB028)

*RECOMMENDATIONS*

*Management strategy evaluation*

SRB028-Rec.01 ([para. 27](#)) The SRB **NOTED** that a single control rule based on relative biomass is unlikely to reach the ramp (descending limb) where reduction in F are triggered. Therefore, the SRB **RECOMMENDED** investigating HCRs based on absolute biomass.

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

SRB028-Rec.02 ([para. 35](#)) **NOTING** that the Secretariat has developed multiple aging methods (epigenetic, AI-based, traditional break and burn otolith aging), the SRB **RECOMMENDED** that a table be developed – with a column for each method - describing:

- a) the different anticipated use cases;
- b) the relative costs (split into development and production) and benefits of these approaches;
- c) timelines for development; and
- d) decision points that will determine future allocation of effort to this method.

*REQUESTS*

*Biology and ecology*

SRB028-Req.01 ([para. 16](#)) The SRB **REQUESTED** an analysis that separates year and biological region effects on maturity ogives. This would answer whether variation in age at maturity is driven by variation in the spatial distribution of the stock or by interannual variation in environmental conditions.

SRB028-Req.02 ([para. 17](#)) The SRB **REQUESTED** that the Secretariat investigate:

- a) environmental predictors of interannual variation in maturity ogives; and
- b) the potential to include time-varying maturity ogives in the stock assessment.

SRB028-Req.03 ([para. 18](#)) The SRB **REQUESTED** that, as more epigenetic aging data become available, a more systematic approach to cross-validation be developed in which performance is evaluated across space and time. For example, applying a model trained on samples from all but one area to the withheld area and applying a model trained on samples from all but one year to the withheld year. Ideally, a full factorial approach could be used to determine whether any training-test combinations perform inadequately.

*Pacific halibut stock assessment*

SRB028-Req.04 ([para. 21](#)) **NOTING** the progress presented in [IPHC-2026-SRB028-07](#) on assembling a list of state space modelling platforms and their associated features, the SRB **REQUESTED** an update at SRB029 on progress to develop initial models, including approaches to mimic



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essential features of the Pacific halibut assessment (e.g. sex specific modelling) using other means (e.g. the spatial area features in multi-WHAM).

***Management strategy evaluation***

SRB028-Req.05 ([para. 23](#)) The SRB **REQUESTED** that the Secretariat investigate, via the MSE, control rules based on changes to the risk of overfishing (often referred to as p\*, see Shertzer et al. 2008<sup>1</sup>).

SRB028-Req.06 ([para. 25](#)) **RECALLING** that at SRB026, the SRB made the following recommendation,

[IPHC-2025-SRB026-R](#), SRB026-Rec.07 (para. 24) “*The SRB RECOMMENDED that recruitment projections in the stock assessment and Management Strategy Evaluation (MSE) incorporate a random-walk starting from the most recent reliable recruitment estimate to constrain expected short-term recruitment around recent estimates rather than immediately reverting to the stock-recruitment relationship.*”

and **NOTING** the update provided by the Secretariat at SRB028, the SRB **REQUESTED** an analysis of projecting recruitment via projections in environmental drivers (Pacific Decadal Oscillation) in addition to autocorrelated recruitment, which tends to rapidly revert to the mean.