



Report of the 20th Session of the IPHC Scientific Review Board (SRB020)

Meeting held electronically, 14-16 June 2022

Commissioners

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ACRONYMS

AM	Annual Meeting
CV	Coefficient of Variation
DMR	Discard Mortality Rate
FISS	Fishery-Independent Setline Survey
IPHC	International Pacific Halibut Commission
MSAB	Management Strategy Advisory Board
MSE	Management Strategy Evaluation
OM	Operating Model
SRB	Scientific Review Board
U.S.A.	United States of America
WPUE	Weight-Per-Unit-Effort

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 20th Session of the International Pacific Halibut Commission (IPHC) Scientific Review Board (SRB020) was held in Seattle, WA, USA from 14 to 16 June 2022. 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 SRB020, which are provided in full at [Appendix IV](#).

([para. 12](#)) The SRB **ENDORSED** the final 2023 FISS design as presented in [Fig. 2](#), and provisionally **ENDORSED** the 2024-25 designs ([Figs. 3 and 4](#)), recognizing that these will be reviewed again at subsequent SRB meetings.

RECOMMENDATIONS

IPHC Fishery-independent setline survey (FISS)

SRB020-Rec.01 ([para. 11](#)) **NOTING** that the coefficient of variation (CV) for IPHC Regulatory Area 4B exceeded the 15% threshold in 2021 because some stations could not be sampled for logistical reasons (in 2022 the issue is likely to persist due to non-viable bids (economic and logistical reasons)), which may continue into the foreseeable future, the SRB **RECOMMENDED** continuing to investigate potential means to mitigate these effects. For example, by increasing the pool of potential bidders by including vessel using snap-gear.

Pacific halibut stock assessment: 2022

SRB020-Rec.02 ([para. 23](#)) The SRB **NOTED** that most models within the ensemble produced reasonable and well-constrained estimates of natural mortality (M) and **RECOMMENDED** that estimation of M should be adopted in the short AAF assessment model with consideration in other models as part of the stock assessment research program.

SRB020-Rec.03 ([para. 24](#)) The SRB **NOTED** that the bootstrapping approach to determining maximum samples sizes for age-composition data improved assessment model performance and stability and, therefore, **RECOMMENDED** that the bootstrapping approach be adopted for data-weighting in future assessments.

SRB020-Rec.04 ([para. 25](#)) The SRB **NOTED** apparent discrepancies in marine mammal prevalence among anecdotal reports, FISS observations, and preliminary evaluation of logbook data, and therefore **RECOMMENDED** further investigation of methods to better estimate marine mammal prevalence and impacts on the fishery.

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

SRB020-Rec.05 ([para. 36](#)) The SRB **NOTED** the exceptional level of transparency and commitment to the principles of open science represented by the Secretariat's data and code-sharing practices and, therefore, **RECOMMENDED** that the Secretariat consider producing peer-reviewed data report publications, which would (a) enhance outreach to potential external data users and (b) allow for tracking external use of IPHC data and resources.

REQUESTS

IPHC Fishery-independent setline survey (FISS)

SRB020-Req.01 ([para. 14](#)) **NOTING** Table 4 in paper [IPHC-2022-SRB020-05](#) showing that observed CVs for the 2021 O32 WPUE for IPHC Regulatory Areas 2A was 20% higher than expected based on space-time model projections, the SRB **REQUESTED** that the Secretariat examine whether changes in the depth-CPUE relationship could explain extra spatial variation.



Management Strategy Evaluation: update

- SRB020-Req.02 ([para. 18](#)) The SRB **NOTED** the Secretariat's plan to further explore migration scenarios in the MSE and therefore **REQUESTED** that the set of migrations scenarios remain within bounds of plausible values identified via the OM development/fitting and previous tagging studies.
- SRB020-Req.03 ([para. 19](#)) The SRB **REQUESTED** that the ramped implementation bias scenario (Fig. 17 in paper [IPHC-2022-SRB020-06 Rev 1](#)) be run under the most aggressive fishing intensity targets to determine the scale of performance sensitivity to that source of implementation variability.
- SRB020-Req.04 ([para. 20](#)) The SRB **REQUESTED** that the MSE not attempt to implement a Stock Synthesis estimation procedure as part of the management procedure and, instead, to integrate a simpler assessment modelling approach into the management procedure via tuning.
- SRB020-Req.05 ([para. 21](#)) The SRB **REQUESTED** evaluating whether the relative ranking of MPs – defined only by multi-year assessment cycle and size limits - remains similar across the set of proposed distribution scenarios using objectives identified as priorities by the Commission.

Pacific halibut stock assessment: 2022

- SRB020-Req.06 ([para. 26](#)) The SRB **NOTED** the proposed new ensemble model weighting scheme using the MASE criterion and **REQUESTED** investigation of predictive skill on additional quantities such as fishery CPUE and mean age in FISS samples.

Biological and ecosystem sciences – Project updates

- SRB020-Req.07 ([para. 29](#)) The SRB **NOTED** continued progress toward integration of biological and ecosystem sciences activities with the needs of Stock Assessment (SA) and MSE programs, and **REQUESTED** that future presentations/documents identify (a) the planned statistical analysis of biological data and (b) parameters or structural decisions within SA and MSE to be informed by the results.
- SRB020-Req.08 ([para. 30](#)) The SRB **NOTED** progress on further developing genomic resources through low-coverage whole genome sequencing and, therefore, **REQUESTED** that the Secretariat provide a detailed plan for bioinformatic interrogation and how data will be used to address IPHC questions related to stock assessment.



1. OPENING OF THE SESSION

1. The 20th Session of the International Pacific Halibut Commission (IPHC) Scientific Review Board (SRB020) was held in Seattle, WA, USA from 14 to 16 June 2022. 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 \(2022\)](#):
 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 all documents for the meeting were published on the IPHC website, 30 days prior to the Session: <https://www.iphc.int/venues/details/20th-session-of-the-iphc-scientific-review-board-srb020>

3. IPHC PROCESS

3.1 *SRB annual workflow*

4. **NOTING** that the core purpose of the SRB020 is to review progress on the IPHC research and monitoring activities, and to provide guidance for the delivery of products to the SRB021 in September 2022, the SRB **RECALLED** that formal recommendations to the Commission would not be developed at the present meeting, but rather, these would be developed at the SRB021.

3.2 *Update on the actions arising from the 19th Session of the SRB (SRB019)*

5. The SRB **NOTED** paper [IPHC-2022-SRB020-03](#), which provided the SRB with an opportunity to consider the progress made during the intersessional period, on the recommendations/requests arising from the SRB019.
6. The SRB **AGREED** to consider and revise the actions as necessary, and to combine them with any new actions arising from SRB020 into a consolidated list for future reporting.

3.3 *Outcomes of the 98th Session of the IPHC Annual Meeting (AM098)*

7. The SRB **NOTED** paper [IPHC-2022-SRB020-04](#) which detailed the outcomes of the 98th Session of the IPHC Annual Meeting (AM098), 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

8. The SRB **NOTED** the following updates (paraphrased) from the Canadian science advisor:
- a) *Management strategy evaluation (MSE): Concerns from CDN MSAB regarding (i) adding "performance metric related to economics and (ii) the ability to differentiate the impacts of multi-year assessments & size limit MPs when there are 5 distribution methods in the background;*
 - b) *Stock Assessment: there is general interest in evaluating multi-year stock assessments, but require a better understanding the specific scientific (not economic) costs and benefits;*
 - c) *Biological & ecosystem: could improve transparency between research components and products that the Commissioners regularly see (e.g. stock assessment) is useful and could be made more useful with longer lead-up prior to actual results. For example, the actual impact of sex ratio from commercial fisheries on the assessment was a bit of a surprise;*
 - d) *IPHC 5-year integrated research program: need to clarify role and contribution of life history modeller and to more directly show linkages between SRB REQUESTS, RECOMMENDATIONS, and the 5-year plan*
 - e) *CDN Commissioners & CDN MSAB expressed no concerns about including implementation variability in the MSE, but there was some concern about how historical deviations from MPs have been calculated and whether it's actually an accurate representation of deviations.*

Several SRB recommendations and requests within this current SRB report cover the above concerns and interests.

4. IPHC FISHERY-INDEPENDENT SETLINE SURVEY (FISS)

4.1 2023 FISS design evaluation

9. The SRB **NOTED** paper [IPHC-2022-SRB020-05](#), which proposed designs for the IPHC's Fishery-Independent Setline Survey (FISS) for the 2023-25 period, and an evaluation of those designs, for review by the Scientific Review Board.
10. The SRB **NOTED** the full FISS sampling grid which consists of 1890 stations ([Fig. 1](#)) 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 NOAA-Fisheries and Alaska Department of Fish and Game (ADFG) trawl surveys (stations vary by year based on the full designs shown in [Fig. 1](#)).

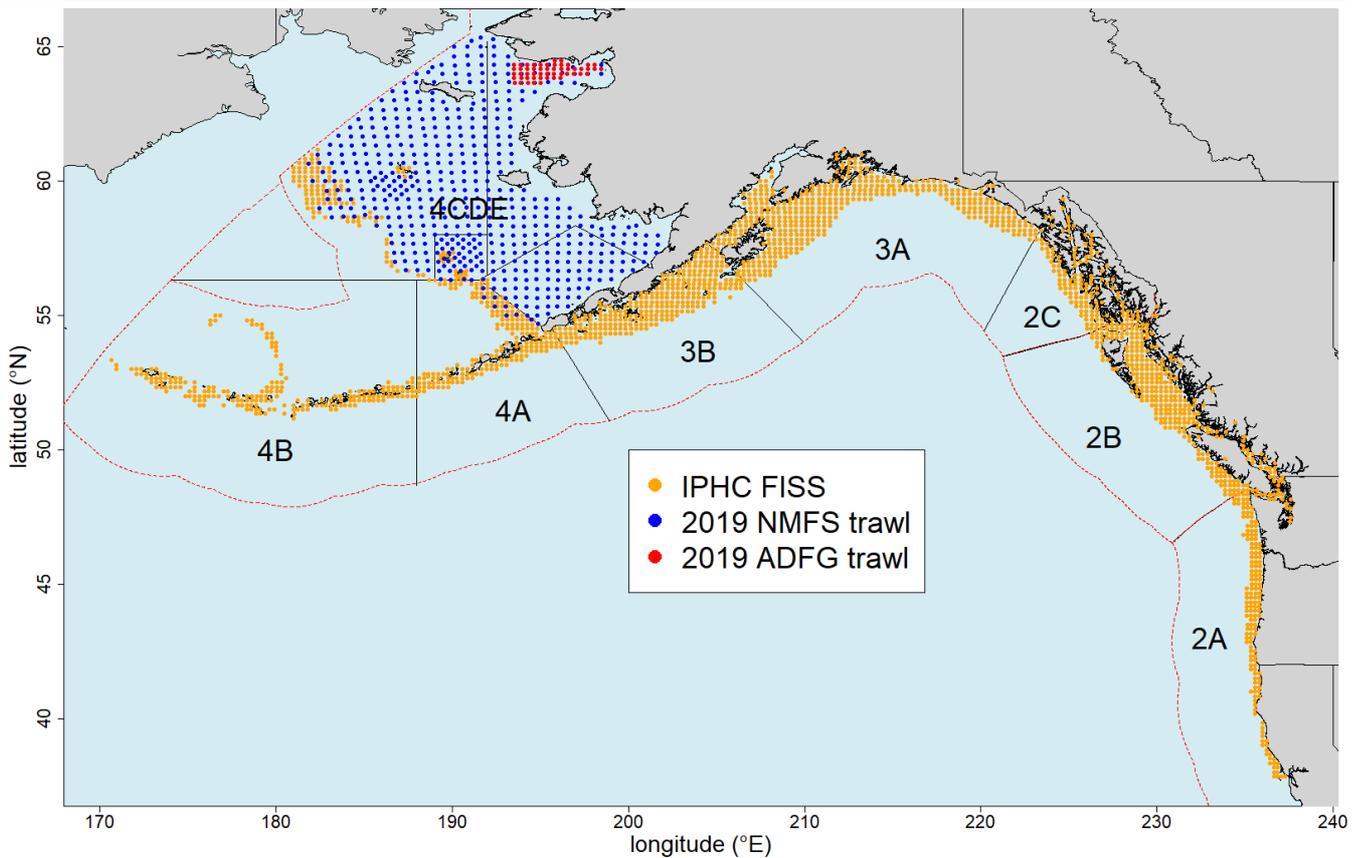


Figure 1. Map of the full 1890 station FISS design, with orange circles representing stations available for inclusion in annual sampling designs, and other colours representing trawl stations from 2019 NMFS and ADFG surveys used to provide complementary data for Bering Sea modelling.

11. **NOTING** that the coefficient of variation (CV) for IPHC Regulatory Area 4B exceeded the 15% threshold in 2021 because some stations could not be sampled for logistical reasons (in 2022 the issue is likely to persist due to non-viable bids (economic and logistical reasons)), which may continue into the foreseeable future, the SRB **RECOMMENDED** continuing to investigate potential means to mitigate these effects. For example, by increasing the pool of potential bidders by including vessel using snap-gear.
12. The SRB **ENDORSED** the final 2023 FISS design as presented in [Fig. 2](#), and provisionally **ENDORSED** the 2024-25 designs ([Figs. 3 and 4](#)), recognizing that these will be reviewed again at subsequent SRB meetings.

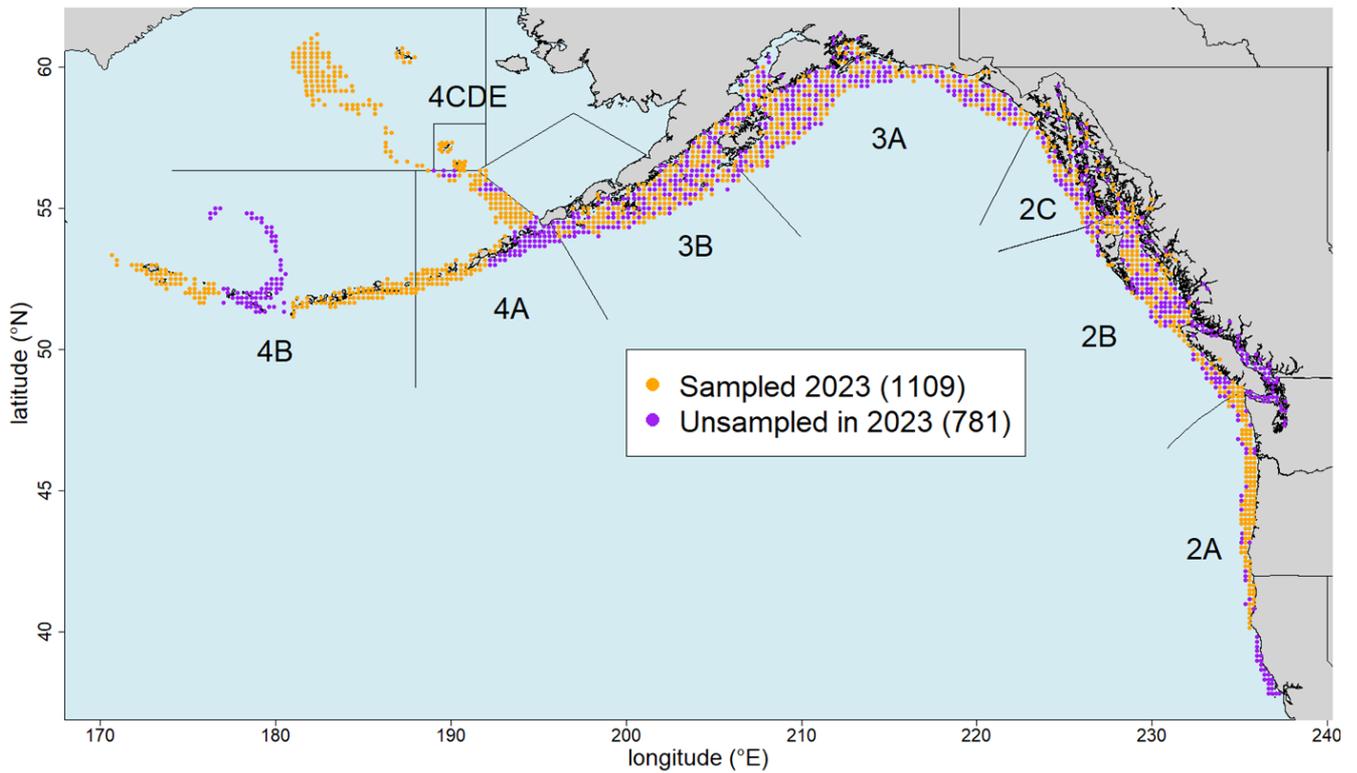


Figure 2. Endorsed minimum FISS design in 2023 (orange circles) based on randomized sampling in 2B-3B, and a subarea design elsewhere. Purple circles are optional for meeting data quality criteria.

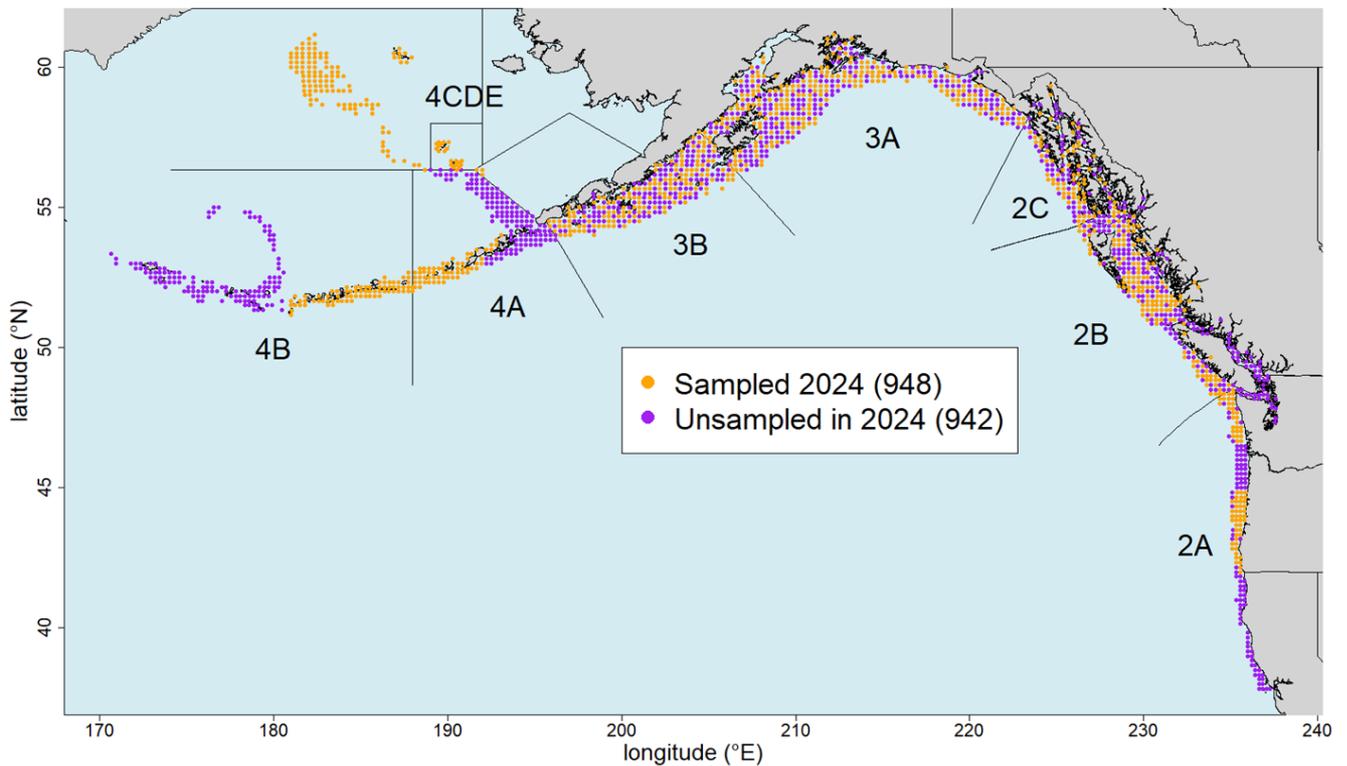


Figure 3. Proposed minimum FISS design in 2024 (orange circles) based on randomized sampling in 2B-3B, and a subarea design elsewhere. Purple circles are optional for meeting data quality criteria.

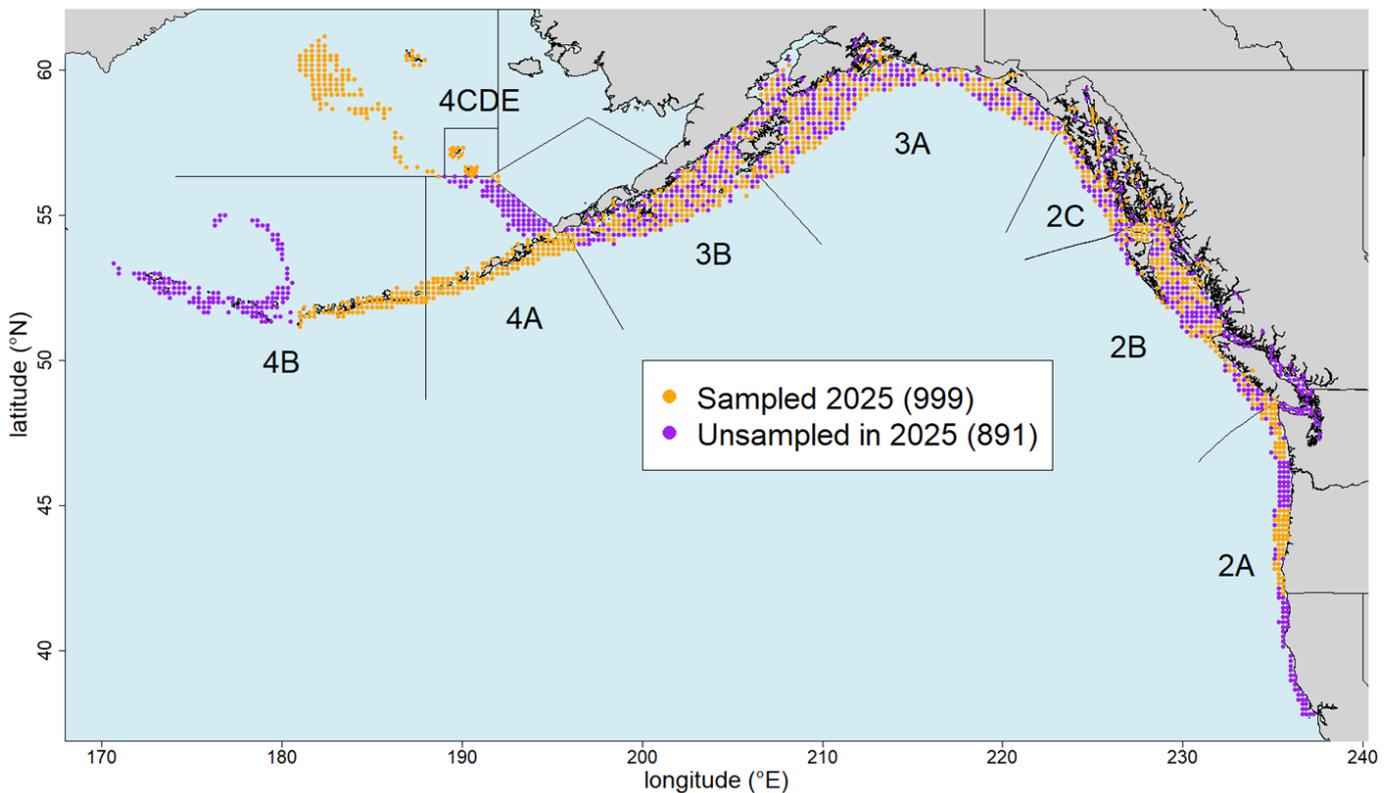


Figure 4. Proposed minimum FISS design in 2025 (orange circles) based on randomized sampling in 2B-3B, and a subarea design elsewhere. Purple circles are optional for meeting data quality criteria.

4.2. Updates to space-time modelling

13. The SRB **NOTED** and **APPRECIATED** the thorough responses to SRB018-Req. 01 which requested the Secretariat examine plotting WPUE vs Depth for the fishery and FISS to better understand whether the Pacific halibut stock extends to deeper waters, and to request SRB018-Req. 02, preliminary comparison of FISS estimates of sex-disaggregated data from the space-time model.
14. **NOTING** Table 4 in paper [IPHC-2022-SRB020-05](#) showing that observed CVs for the 2021 O32 WPUE for IPHC Regulatory Areas 2A was 20% higher than expected based on space-time model projections, the SRB **REQUESTED** that the Secretariat examine whether changes in the depth-CPUE relationship could explain extra spatial variation.

5. MANAGEMENT STRATEGY EVALUATION: UPDATE

15. The SRB **NOTED** paper [IPHC-2022-SRB020-06 Rev_1](#) which provided the SRB with an update of progress on the Management Strategy Evaluation (MSE) program of work for 2022–2023.
16. The SRB **NOTED** and **APPRECIATED** the many improvements to the closed-loop simulation framework, methods to simulate implementation variability, two types of management procedures to simulate and evaluate in 2022, and potential areas of improvement to the evaluation process.
17. The SRB **NOTED**:
 - a) two new population models conditioned using assumptions and outputs from the long AAF and CW models from the recent stock assessment will be used as an ensemble OM.
 - b) that improvements to the closed-loop simulation framework allow for a more direct method of evaluating size limits without specifically modelling a growth curve.
 - c) the methods for simulating implementation error based on past management outcomes.



-
- d) that there are costs and benefits to not conducting annual stock assessments, which may affect research opportunities.
 - e) that five primary MPs investigating three size-limits, and annual and biennial assessments will be evaluated in 2022, with five distribution procedures treated as uncertainty. Sensitivities will be performed using the best performing MPs.
18. The SRB **NOTED** the Secretariat's plan to further explore migration scenarios in the MSE and therefore **REQUESTED** that the set of migrations scenarios remain within bounds of plausible values identified via the OM development/fitting and previous tagging studies.
19. The SRB **REQUESTED** that the ramped implementation bias scenario (Fig. 17 in paper [IPHC-2022-SRB020-06 Rev 1](#)) be run under the most aggressive fishing intensity targets to determine the scale of performance sensitivity to that source of implementation variability.
20. The SRB **REQUESTED** that the MSE not attempt to implement a Stock Synthesis estimation procedure as part of the management procedure and, instead, to integrate a simpler assessment modelling approach into the management procedure via tuning.
21. The SRB **REQUESTED** evaluating whether the relative ranking of MPs – defined only by multi-year assessment cycle and size limits - remains similar across the set of proposed distribution scenarios using objectives identified as priorities by the Commission.

6. PACIFIC HALIBUT STOCK ASSESSMENT: 2022

22. The SRB **NOTED** and **APPRECIATED** the extensive documentation and background perspective supporting paper [IPHC-2022-SRB020-07](#), which provided a preliminary analyses in development of the 2022 Pacific halibut (*Hippoglossus stenolepis*) stock assessment. It follows the previous full stock assessment and independent peer review conducted in 2019, and subsequent updates to that assessment in 2020 and 2021.
23. The SRB **NOTED** that most models within the ensemble produced reasonable and well-constrained estimates of natural mortality (M) and **RECOMMENDED** that estimation of M should be adopted in the short AAF assessment model with consideration in other models as part of the stock assessment research program.
24. The SRB **NOTED** that the bootstrapping approach to determining maximum samples sizes for age-composition data improved assessment model performance and stability and, therefore, **RECOMMENDED** that the bootstrapping approach be adopted for data-weighting in future assessments.
25. The SRB **NOTED** apparent discrepancies in marine mammal prevalence among anecdotal reports, FISS observations, and preliminary evaluation of logbook data, and therefore **RECOMMENDED** further investigation of methods to better estimate marine mammal prevalence and impacts on the fishery.
26. The SRB **NOTED** the proposed new ensemble model weighting scheme using the MASE criterion and **REQUESTED** investigation of predictive skill on additional quantities such as fishery CPUE and mean age in FISS samples.
27. The SRB **NOTED** that assessment research activities (e.g. [paras. 23-26](#)) are examples of work that could be done more extensively in non-assessment years within a multi-year assessment schedule. Other work could include investigating optimal sub-sampling designs for ages, sex-ratio, annual assessment methods to use within the MPs, and well as any of the several topics listed under Stock Assessment Research. The quantifiable costs of multi-year assessments could be estimated within the MSE, for example, of potentially lower average yield for longer assessment cycles to achieve the same levels of risk associated with annual assessments.



7. BIOLOGICAL AND ECOSYSTEM SCIENCES – PROJECT UPDATES

28. The SRB **NOTED** paper [IPHC-2022-SRB020-08](#) which provided the SRB with a description of progress towards the finalization of IPHC’s five-year Biological and Ecosystem Science Research Plan (2017-21) and the start of the IPHC’s five-year Program of Integrated Research and Monitoring (2022-2026).
29. The SRB **NOTED** continued progress toward integration of biological and ecosystem sciences activities with the needs of Stock Assessment (SA) and MSE programs, and **REQUESTED** that future presentations/documents identify (a) the planned statistical analysis of biological data and (b) parameters or structural decisions within SA and MSE to be informed by the results.
30. The SRB **NOTED** progress on further developing genomic resources through low-coverage whole genome sequencing and, therefore, **REQUESTED** that the Secretariat provide a detailed plan for bioinformatic interrogation and how data will be used to address IPHC questions related to stock assessment.
31. The SRB **NOTED** that progress had been made to complete research in each of the five main areas within the 2017-2021 IPHC 5-year Research Plan and **ACKNOWLEDGED** the number of manuscripts drafted and/or published in the peer review literature.

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

32. The SRB **NOTED** and **APPRECIATED** paper [IPHC-2022-SRB020-10](#) which provided the SRB with the new IPHC 5-year program of integrated research and monitoring (the Plan) which takes into consideration the requested changes from the previous SRB meeting (ref. SRB019–Req.11).
33. 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, and where deemed necessary, including by the Commission, additional external peer review;
 - d) the IPHC Secretariat commenced implementation of the new Plan at the start of 2022 and will keep the Plan under review on an ongoing basis.
34. 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.
35. The SRB **NOTED** the indication from the IPHC Secretariat that:
 - a) the intention is to ensure the new integrated plan is kept as a ‘*living plan*’, that is reviewed and updated annually based on the resources available to undertake the work of the Commission (e.g. internal and external fiscal resources, collaborations, internal expertise);
 - b) the plan focuses on core responsibilities of the Commission; and any redirection provided by the Commission;



- c) each year the SRB may choose to recommend modifications to the current Plan, and that any modifications subsequently made would be documented both in the Plan itself, and through reporting back to the SRB.
36. The SRB **NOTED** the exceptional level of transparency and commitment to the principles of open science represented by the Secretariat’s data and code-sharing practices and, therefore, **RECOMMENDED** that the Secretariat consider producing peer-reviewed data report publications, which would (a) enhance outreach to potential external data users and (b) allow for tracking external use of IPHC data and resources.
37. The SRB **REQUESTED** that during the next update of the Plan, the following could be considered:
- a) revise the Focal Area Objectives for the Stock Assessment and MSE sections;
 - b) revise Measures of Success to:
 - i. Replace “3) Accuracy” and “4) Reduction in uncertainty” with “3) Relevance” and “4) Impact” with the latter two defined by the above Focal Objectives;
 - ii. change “Transparency” to “Accessibility”.
 - c) more completely account for external research funding in support of IPHC’s mission, for example, by funding students working on stock assessment topics directly related to halibut stock assessment;
 - d) explore genetics-based mark-recapture within the long-term research plan to better inform migration in the MSE operating model.

9. PACIFIC HALIBUT FISHERY ECONOMICS – PROJECT REPORT

38. The SRB **NOTED** paper [IPHC-2022-SRB020-09](#) which provided the Pacific halibut multiregional economic impact assessment (PHMEIA) model project, which has now concluded.
39. The SRB **NOTED** that the PHMEIA was a core product of the IPHC socioeconomic study directly responding to the Commission’s “*desire for more comprehensive economic information to support the overall management of the Pacific halibut resource in fulfillment of its mandate*” (economic study terms of reference adopted at FAC095 (IPHC-2019-FAC095) and endorsed at AM095 in 2019). The update complements the full project report available as an information paper IPHC-2022-ECON-01. The project was concluded at the 98th Session of the IPHC Annual Meeting (AM098) (IPHC–2022–AM098–R, par. 70).

10. REVIEW OF THE DRAFT AND ADOPTION OF THE REPORT OF THE 20TH SESSION OF THE IPHC SCIENTIFIC REVIEW BOARD (SRB020)

40. The report of the 20th Session of the IPHC Scientific Review Board ([IPHC-2022-SRB020-R](#)) was **ADOPTED** on 16 June 2022, including the consolidated set of recommendations and/or requests arising from SRB018, provided at [Appendix IV](#).



APPENDIX I

**LIST OF PARTICIPANTS FOR THE 20TH SESSION OF THE
IPHC SCIENTIFIC REVIEW BOARD (SRB020)**

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APPENDIX II
AGENDA FOR THE 20TH SESSION OF THE
IPHC SCIENTIFIC REVIEW BOARD (SRB020)

Date: 14-16 June 2022
Location: Seattle, WA, USA, & Electronic Meeting
Venue: IPHC HQ & Adobe Connect
Time: 12:30-17:00 (14th), 09:00-17:00 (15-16th) 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 19th Session of the SRB (SRB019) (D. Wilson)
 - 3.3. Outcomes of the 98th Session of the IPHC Annual Meeting (AM098) (D. Wilson)
 - 3.4. Observer updates (e.g. Science Advisors)
- 4. IPHC FISHERY-INDEPENDENT SETLINE SURVEY (FISS)**
 - 4.1. 2023 FISS design evaluation (R. Webster)
 - 4.2. Updates to space-time modelling (R. Webster)
- 5. MANAGEMENT STRATEGY EVALUATION: UPDATE**
- 6. PACIFIC HALIBUT STOCK ASSESSMENT: 2022**
- 7. BIOLOGICAL AND ECOSYSTEM SCIENCES – PROJECT UPDATES**
- 8. INTERNATIONAL PACIFIC HALIBUT COMMISSION 5-YEAR PROGRAM OF INTEGRATED RESEARCH AND MONITORING (2022-26)**
- 9. PACIFIC HALIBUT FISHERY ECONOMICS – PROJECT REPORT**
- 10. REVIEW OF THE DRAFT AND ADOPTION OF THE REPORT OF THE 20TH SESSION OF THE IPHC SCIENTIFIC REVIEW BOARD (SRB020)**



APPENDIX III
LIST OF DOCUMENTS FOR THE 20TH SESSION OF THE
IPHC SCIENTIFIC REVIEW BOARD (SRB020)

Document	Title	Availability
IPHC-2022-SRB020-01	Agenda & Schedule for the 20 th Session of the Scientific Review Board (SRB020)	✓ 16 Mar 2022
IPHC-2022-SRB020-02	List of Documents for the 20 th Session of the Scientific Review Board (SRB020)	✓ 16 Mar 2022 ✓ 13 May 2022 ✓ 2 June 2022
IPHC-2022-SRB020-03	Update on the actions arising from the 19 th Session of the SRB (SRB019) (IPHC Secretariat)	✓ 11 May 2022
IPHC-2022-SRB020-04	Outcomes of the 98 th Session of the IPHC Annual Meeting (AM098) (D. Wilson)	✓ 6 May 2022
IPHC-2022-SRB020-05	2023-25 FISS design evaluation (R. Webster)	✓ 13 May 2022
IPHC-2022-SRB020-06 Rev_1	IPHC Secretariat MSE Program of Work (2022–2023) and an update on progress (A. Hicks & I. Stewart)	✓ 12 May 2022 ✓ 1 June 2022
IPHC-2022-SRB020-07	Development of the 2022 Pacific halibut (<i>Hippoglossus stenolepis</i>) stock assessment (I. Stewart & A. Hicks)	✓ 11 May 2022
IPHC-2022-SRB020-08	Report on current and future biological and ecosystem science research activities (J. Planas)	✓ 11 May 2022
IPHC-2022-SRB020-09	Pacific Halibut Multiregional Economic Impact Assessment (PHMEIA): Project Report (B. Hutniczak)	✓ 6 May 2022
IPHC-2022-SRB020-10	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, & J. Jannot)	✓ 13 May 2022
Information papers		
Nil to-date	Nil to-date	-



APPENDIX IV

CONSOLIDATED SET OF RECOMMENDATIONS AND REQUESTS OF THE 20TH SESSION OF THE
IPHC SCIENTIFIC REVIEW BOARD (SRB020)

RECOMMENDATIONS

IPHC Fishery-independent setline survey (FISS)

SRB020–Rec.01 ([para. 11](#)) **NOTING** that the coefficient of variation (CV) for IPHC Regulatory Area 4B exceeded the 15% threshold in 2021 because some stations could not be sampled for logistical reasons (in 2022 the issue is likely to persist due to non-viable bids (economic and logistical reasons)), which may continue into the foreseeable future, the SRB **RECOMMENDED** continuing to investigate potential means to mitigate these effects. For example, by increasing the pool of potential bidders by including vessel using snap-gear.

Pacific halibut stock assessment: 2022

SRB020–Rec.02 ([para. 23](#)) The SRB **NOTED** that most models within the ensemble produced reasonable and well-constrained estimates of natural mortality (M) and **RECOMMENDED** that estimation of M should be adopted in the short AAF assessment model with consideration in other models as part of the stock assessment research program.

SRB020–Rec.03 ([para. 24](#)) The SRB **NOTED** that the bootstrapping approach to determining maximum samples sizes for age-composition data improved assessment model performance and stability and, therefore, **RECOMMENDED** that the bootstrapping approach be adopted for data-weighting in future assessments.

SRB020–Rec.04 ([para. 25](#)) The SRB **NOTED** apparent discrepancies in marine mammal prevalence among anecdotal reports, FISS observations, and preliminary evaluation of logbook data, and therefore **RECOMMENDED** further investigation of methods to better estimate marine mammal prevalence and impacts on the fishery.

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

SRB020–Rec.05 ([para. 36](#)) The SRB **NOTED** the exceptional level of transparency and commitment to the principles of open science represented by the Secretariat’s data and code-sharing practices and, therefore, **RECOMMENDED** that the Secretariat consider producing peer-reviewed data report publications, which would (a) enhance outreach to potential external data users and (b) allow for tracking external use of IPHC data and resources.

REQUESTS

IPHC Fishery-independent setline survey (FISS)

SRB020–Req.01 ([para. 14](#)) **NOTING** Table 4 in paper [IPHC-2022-SRB020-05](#) showing that observed CVs for the 2021 O32 WPUE for IPHC Regulatory Areas 2A was 20% higher than expected based on space-time model projections, the SRB **REQUESTED** that the Secretariat examine whether changes in the depth-CPUE relationship could explain extra spatial variation.

Management Strategy Evaluation: update

SRB020–Req.02 ([para. 18](#)) The SRB **NOTED** the Secretariat’s plan to further explore migration scenarios in the MSE and therefore **REQUESTED** that the set of migrations scenarios remain within bounds of plausible values identified via the OM development/fitting and previous tagging studies.

SRB020–Req.03 ([para. 19](#)) The SRB **REQUESTED** that the ramped implementation bias scenario (Fig. 17 in paper [IPHC-2022-SRB020-06 Rev 1](#)) be run under the most aggressive fishing intensity targets to determine the scale of performance sensitivity to that source of implementation variability.



SRB020–Req.04 ([para. 20](#)) The SRB **REQUESTED** that the MSE not attempt to implement a Stock Synthesis estimation procedure as part of the management procedure and, instead, to integrate a simpler assessment modelling approach into the management procedure via tuning.

SRB020–Req.05 ([para. 21](#)) The SRB **REQUESTED** evaluating whether the relative ranking of MPs – defined only by multi-year assessment cycle and size limits - remains similar across the set of proposed distribution scenarios using objectives identified as priorities by the Commission.

Pacific halibut stock assessment: 2022

SRB020–Req.06 ([para. 26](#)) The SRB **NOTED** the proposed new ensemble model weighting scheme using the MASE criterion and **REQUESTED** investigation of predictive skill on additional quantities such as fishery CPUE and mean age in FISS samples.

Biological and ecosystem sciences – Project updates

SRB020–Req.07 ([para. 29](#)) The SRB **NOTED** continued progress toward integration of biological and ecosystem sciences activities with the needs of Stock Assessment (SA) and MSE programs, and **REQUESTED** that future presentations/documents identify (a) the planned statistical analysis of biological data and (b) parameters or structural decisions within SA and MSE to be informed by the results.

SRB020–Req.08 ([para. 30](#)) The SRB **NOTED** progress on further developing genomic resources through low-coverage whole genome sequencing and, therefore, **REQUESTED** that the Secretariat provide a detailed plan for bioinformatic interrogation and how data will be used to address IPHC questions related to stock assessment.

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

SRB020–Req.09 ([para. 37](#)) The SRB **REQUESTED** that during the next update of the Plan, the following could be considered:

- a) revise the Focal Area Objectives for the Stock Assessment and MSE sections;
- b) revise Measures of Success to:
 - i. Replace “3) Accuracy” and “4) Reduction in uncertainty” with “3) Relevance” and “4) Impact” with the latter two defined by the above Focal Objectives;
 - ii. change “Transparency” to “Accessibility”.
- c) more completely account for external research funding in support of IPHC’s mission, for example, by funding students working on stock assessment topics directly related to halibut stock assessment;
- d) explore genetics-based mark-recapture within the long-term research plan to better inform migration in the MSE operating model.