Report of the 12th Session of the IPHC Scientific Review Board (SRB012)

Seattle, Washington, U.S.A., 19-21 June 2018

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INTERNATIONAL PACIFIC HALIBUT COMMISSION

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ACRONYMS

AM	Annual Meeting
CDN	Canada
CPUE	Catch-per-unit-effort
DMR	Discard Mortality Rate
DO	Dissolved Oxygen
IPHC	International Pacific Halibut Commission
MSAB	Management Strategy Advisory Board
MSE	Management Strategy Evaluation
NPUE	Number-Per-Unit-Effort
OM	Operating Model
SB	Spawning Biomass
SRB	Scientific Review Board
U.S.A.	United States of America
WPUE	Weight-Per-Unit-Effort

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** (formal); **REQUESTED** (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 (or subsidiary body) 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/members 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 (or subsidiary body) 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 12th Session of the International Pacific Halibut Commission (IPHC) Scientific Review Board (SRB012) was held in Seattle, Washington, U.S.A. from 19 to 21 June 2018. The meeting was opened by the Chairperson, Dr Sean Cox (Canada), and the Executive Director, Dr David Wilson, who welcomed participants to Seattle.

The following are a subset of the complete recommendations/requests arising from the SRB012, which are provided at Appendix IV.

RECOMMENDATIONS

(para. 8) **NOTING** that the core purpose of the SRB012 is to review progress on the IPHC scientific program, and to provide guidance for the delivery of products to the SRB013 in September 2018, the SRB **AGREED** that formal recommendations to the Commission would not be developed at the present meeting, but rather, these would be developed at the SRB013.

REQUESTS

Outcomes of MSAB011

SRB012–Req.03 (para. 28) With respect to the above two excerpts from IPHC-2017-SRB011-R, the SRB **AGREED** to the following clarifications:

a) *IPHC-2017-SRB011-R*, *paragraph 24* simply recognizes that perfect knowledge simulation will under-represent short- and medium-term risks to both the stock and fisheries that result from persistent stock assessment errors. The SRB also **NOTED** that *IPHC-2017-SRB011-R* *paragraph 24* does not imply concatenating short-term projections from the ensemble assessment model with long-term projections from the MSE.

b) The SRB **NOTED** that the original intent of *IPHC-2017-SRB011-R*, *paragraph 28* was to exclude OM states and parameters that resulted in quasi-extinction of the stock before 2017 and **REQUESTED** that, by SRB013, the IPHC Secretariat confirm that this problem no longer exists so that the full OM distribution can be used.

Updates to MSE framework and closed-loop simulations

SRB012–Req.04 (para. 33) The SRB **AGREED** that with respect to all of the topics listed above in paragraph 32, it cannot make an objective assessment of the appropriateness of choices and methods used in the MSE OM conditioning and projections in the absence of simulation results. The SRB **REQUESTED** a presentation of MSE simulation results by SRB013.

Five-year research plan and management implications

SRB012–Req.06 (para. 37) The SRB **REQUESTED** that readers of this report to refer to paragraphs 46-72 from IPHC-2017-SRB010-R for in-depth background comments previously made on the biological research program components.

SRB012–Req.07 (para. 39) The SRB **REQUESTED** that IPHC establish dedicated academic funding programs through which IPHC-funded university students participate in research activities.

1. OPENING OF THE SESSION

1. The 12th Session of the International Pacific Halibut Commission (IPHC) Scientific Review Board (SRB012) was held in Seattle, Washington, U.S.A. from 19 to 21 June 2018. 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, who welcomed participants to Seattle.

2. The SRB **RECALLED** its mandate, as detailed in the IPHC Rules of Procedure (2017), as follows:

> Appendix VIII, Sect I, para 1. "*The Scientific Review Board's (SRB) main objective is to provide an independent scientific review of Commission science products and programs, and to support and strengthen the stock assessment process. The SRB shall review modeling and evaluation used by the Management Strategy Advisory Board, and review research proposals from the Research Advisory Board and the IPHC Secretariat. The SRB will prepare reports to the Commission summarising findings, recommendations, and documentation of any divergent views for all of its reviews.*"

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://iphc.int/venues/details/12th-session-of-the-iphc-scientific-review-board-srb012.

3. IPHC PROCESS

3.1 Update on the actions arising from the 11th Session of the SRB (SRB011)

4. The SRB **NOTED** paper IPHC-2018-SRB012-03, which provided an opportunity to consider the progress made during the inter-sessional period, on the recommendations/requests arising from the SRB011.

5. The SRB **AGREED** to consider and revise as necessary, the actions arising that are either in progress or pending, and for these to be combined with any new actions arising from the SRB012 into a consolidated list for future reporting.

3.2 Outcomes of the 94th Session of the IPHC Annual Meeting (AM094)

6. The SRB **NOTED** paper IPHC-2018-SRB012-04 which outlined the main outcomes of the 94th Session of the IPHC Annual Meeting (AM094), 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.

3.3 IPHC Rules of Procedure (2017): Proposed amendments

7. The SRB **NOTED** the intention to revise the IPHC Rules of Procedure at the next session of the Commission in January 2019 (AM095). The revision will include roles and responsibilities of officers of the Commission's subsidiary bodies, as well as a code of conduct for members.

3.4 SRB annual workflow

8. **NOTING** that the core purpose of the SRB012 is to review progress on the IPHC scientific program, and to provide guidance for the delivery of products to the SRB013 in September 2018, the SRB **AGREED** that formal recommendations to the Commission would not be developed at the present meeting, but rather, these would be developed at the SRB013.

4. IPHC FISHERY-INDEPENDENT SETLINE SURVEY (FISS)

4.1 Methods for spatial setline survey modelling – Program of work for 2018

9. The SRB **NOTED** paper IPHC-2018-SRB012-05, which presented results on spatio-temporal survey modelling undertaken to date in 2018, and described plans for the remainder of the year.

10. The SRB **AGREED** that, while dissolved oxygen (DO) levels improved space-time model fits to setline survey data, the results were not compelling or widespread enough (i.e. small effect size estimates) to warrant routine inclusion in the stock assessment process or WPUE/NPUE standardization. DO results could be reported at annual meetings.

11. The SRB **AGREED** that in the analysis of 20 hook vs 100% hook counts, that 20 hook counts were adequate to determine WPUE.

12. **NOTING** the request for advice on the use of slope/rugosity to estimate geographic area of Regulatory Areas or parts of regions, the SRB **AGREED** that adding such complexity is not warranted in estimation of geographic area because of the many potential confounding factors and lack of relevant data to clearly establish relationships between Pacific halibut density (by age, size, sex), catchability, and slope/rugosity.

5. PACIFIC HALIBUT STOCK ASSESSMENT: 2018

5.1 Data source development

13. The SRB **NOTED** paper IPHC-2018-SRB012-06, which provided a summary of anticipated data source development in support of the 2018 and 2019 stock assessment and harvest strategy analyses.

14. The SRB **NOTED** pending development on the topics of individual fish weights, historical bycatch mortality and length frequency data, and effective skate calculations for standardization of the commercial fishery CPUE.

15. The SRB **NOTED** the proposed improvements to data treatment for 2018 including:

    a) Space-time model updates

    b) CPUE reporting

    c) Data status and trends summary tools

    d) Routine data updates

16. The SRB **NOTED** the presentation comparing temporal trends in fixed and snap gear CPUE, and **URGED** the IPHC Secretariat to further provide a correlation plot between relative CPUEs for each gear type by region.

17. The SRB **NOTED**, and was pleased, that whale depredation criteria are improved and that direct estimates of sex ratio will be available for commercial fishery catch for the 2019 stock assessment.

18. **NOTING** the "map" presentation showing Recent Trend and Current Status, the SRB **REQUESTED** the IPHC Secretariat to further code the symbols to indicate relative stock sizes. An example approach for time series was provided via email and code can be made available.

5.2 Modelling updates

19. The SRB **NOTED** paper IPHC-2018-SRB012-07, which provided a summary of anticipated modelling development in support of the 2018 and 2019 stock assessment and harvest strategy analyses.

20. The SRB **NOTED** the planned stock assessment model development, including an updated assessment for 2018 and a full assessment in 2019.

21. The SRB **NOTED** that the topics of model weighting, and Bayesian integration remain open avenues for future research, and that the IPHC Secretariat has submitted a manuscript for publication on the topic of ensemble stability.

22. The SRB **NOTED** that the IPHC Secretariat intends to update the current stock assessment ensemble for 2018, and that potential improvements may include a possible software update to stock synthesis version 3.3, pending the completion of several incompletely implemented features.

5.2.1 An analysis and presentation of a historical 'replay'

23. **NOTING** the request for "replay" analyses, the SRB **AGREED** that "what if" questions about past behaviour are not appropriate for stock assessment models because those analyses do not adequately reflect the information available at the time or information feedbacks to future decision over time. An MSE analysis, on the other hand is specifically designed to answer "what if" questions under particular future scenarios while properly accounting for stock assessment errors in response to changing information.

5.2.2 Graphical and tabulation tools for presentation of currently implemented reference points, potentially including a phase plot

24. The SRB **NOTED** that the phase plot presentation showing historical stock status and fishing intensity is a common and informative way to present fishery status. However, the perception of fishery status depends on the choices for reference points (i.e. vertical and horizontal lines in the spawning biomass and fishing intensity dimensions, respectively) and corresponding zones. Therefore, the SRB **REQUESTED** that the plot not be coloured with discrete "stoplight" colours. It is important that the IPHC Secretariat make it clear to viewers that (1) that F46% is the implied fishing intensity given relatively recent catch history, and (2) that the implied biomass target associated with F46% is not at the crosshairs given in the plot.

5.2.3 *Planned evaluation of model structure for the full assessment in 2019*

25. The SRB **NOTED** that progress will be made over the next year in developing the following in preparation for a new assessment for 2019:

    a. Data weighting
    b. Process error in selectivity, catchability, etc.
    c. Age-based discarding and discard mortality estimation/uncertainty
    d. Timing of survey and catch
    e. Parameterization of sex-ratio for the commercial fishery based on anticipated new data from 2017

6. MANAGEMENT STRATEGY EVALUATION: UPDATE

26. The SRB **NOTED** paper IPHC-2018-SRB012-08 which provided an update on the progress of the IPHC Management Strategy Evaluation process and sought guidance from the SRB regarding the following topics.

    a) Appropriate biological sustainability objectives, as well as proposed biological reference points
    b) Conditioning the OM
    c) Introducing estimation error
    d) Simulation of weight-at-age
    e) Presentation of short-, medium-, and long-term results

6.1 Outcomes of MSAB011

27. The SRB **NOTED** the request from the MSAB011 (IPHC-2018-MSAB011-R, para. 45) that the SRB clarify the meaning of paragraphs 24 and 28 in IPHC-2017-SRB011-R.

> *IPHC-2017-SRB011-R, paragraph 24. "The SRB **NOTED** that the current simulation framework is not yet adequate for evaluating short-term and medium-term outcomes because it assumes perfect knowledge about stock size and parameters in all future years. The SRB looks forward to SRB12 where we expect to see the implications of uncertainty in annual assessments and parameters."*
>
> *IPHC-2017-SRB011-R, paragraph 28. "The SRB **REQUESTED** that the MSE simulation initialize the operating model biomass in the current year from the more precise Ensemble distribution of the current state (e.g., 2017) rather than the wider distribution obtained from the Operating model."*

28. With respect to the above two excerpts from IPHC-2017-SRB011-R, the SRB **AGREED** to the following clarifications:

    a) *IPHC-2017-SRB011-R, paragraph 24* simply recognizes that perfect knowledge simulation will under-represent short- and medium-term risks to both the stock and fisheries that result from persistent stock assessment errors. The SRB also **NOTED** that *IPHC-2017-SRB011-R paragraph 24* does not imply concatenating short-term projections from the ensemble assessment model with long-term projections from the MSE.

    b) The SRB **NOTED** that the original intent of *IPHC-2017-SRB011-R, paragraph 28* was to exclude OM states and parameters that resulted in quasi-extinction of the stock before 2017 and **REQUESTED** that, by SRB013, the IPHC Secretariat confirm that this problem no longer exists so that the full OM distribution can be used.

29. The SRB **AGREED** that the following proposed Biological Sustainability objectives are consistent with standard practice:

    a) 1.1 is retained with a biomass limit of 20% SB_0 and a probability of ≤10%;

    b) 1.2 is probably not necessary since the target is a result of applying the harvest control rule;

    c) Median average relative spawning biomass is also presented;

    d) and the usefulness of these metrics be re-evaluated once the MSE is operational.

30. The SRB **NOTED** the discussion about the need to preserve biocomplexity as an objective under the biological sustainability goal, but recognized that biocomplexity is not an appropriate concept because it is poorly defined and not understood for Pacific halibut, especially over large spatial scales. Further, the terms "preserve" and "preservation" should be "conserve" and "conservation" as most fisheries management is about conservation.

31. **NOTING** paragraph 30, the SRB **AGREED** that the defined Bioregions (i.e. 2,3,4, and 4b described in paper IPHC-2018-SRB012-08) are presently the best option for implementing a precautionary approach given uncertainty about spatial population structure and dynamics of Pacific halibut. Better options may arise with additional biological data (e.g. see Section 7).

6.2 Updates to MSE framework and closed-loop simulations

32. The SRB **NOTED** discussion of the following MSE topics:

    a) conditioning of the Operating Model captures the variability needed for long-term performance metrics, but is not the best predictor of the short-term.

        i. The SRB **AGREED** that the OM is not a forecasting or prediction tool, but rather a means of testing management procedure performance against a suite of alternative hypotheses about the natural world.

b) that implausible trajectories should be filtered out based on the value of steepness because low values of steepness resulted in the long time-series model not matching the observed historical catch.

   i. The SRB **AGREED** that this procedure eliminates potentially low values of steepness, which could create a positive bias in simulated stock productivity.

c) that simulating estimation error may be a practical method for these closed-loop simulations.

   i. The SRB **AGREED** that, while this particular method is practical in the short-term for producing initial results given the current model-based assessment approach, a more effective MSE would include the actual assessment method that is intended for future use in setting harvest levels. In some cases, future management procedures may consider empirically-based harvest control rules, for example.

d) that increasing estimation error beyond current estimates could be tested in a robustness trial.

e) that the closed-loop simulations include autocorrelation in estimation error.

   i. The SRB **AGREED** that, while assessment errors are probably autocorrelated, they also tend to be systematically biased and this may not be reflected in the proposed approach.

f) that using the conditioned Operating Model with the defined amount of variability may be useful for reporting the long-term, equilibrium metrics related to coastwide scale in the management procedure.

g) that using the assessment ensemble is the best predictor of short-term metrics and should be used for reporting short-term performance metrics when evaluating coastwide scale in the management procedure

h) that using sensitivities that span the range of variability will assist with describing medium-term transitions.

   i. The SRB **AGREED**, with respect to (f), (g), and (h), the purpose of an MSE is to compare and rank management procedure performance over many hypotheses and time scales. MSE is not a forecasting tool and should not be used that way in combination with the ensemble assessment, as implied by (g).

33. The SRB **AGREED** that with respect to all of the topics listed above in paragraph 32, it cannot make an objective assessment of the appropriateness of choices and methods used in the MSE OM conditioning and projections in the absence of simulation results. The SRB **REQUESTED** a presentation of MSE simulation results by SRB013.

34. The SRB **NOTED** the intention of the IPHC Secretariat to provide operational characterizations of overfished and overfishing to define a harvest strategy policy as well as for use in communicating externally (e.g. fishery bodies in USA and Canada).

6.3 MSAB Program of Work and delivery of timeline for 2018 and beyond

35. The SRB **NOTED** the MSAB Program of Work, and that the Commission had approved the hiring of two contract staff (a programmer and researcher) to ensure that the MSE work provide initial management procedure recommendations no later than January 2021.

7. BIOLOGICAL AND ECOSYSTEM SCIENCE PROGRAM RESEARCH UPDATES

7.1 Five-year research plan and management implications

36. The SRB **NOTED** and was very pleased with the progress made integrating the biological, assessment, and MSE aspects of IPHC research, as well as the approach used to present this integration. The SRB

further **REQUESTED** that the presentation approach be further developed and used to communicate IPHC research at future annual meetings.

37. The SRB **REQUESTED** that readers of this report to refer to paragraphs 46-72 from IPHC-2017-SRB010-R for in-depth background comments previously made on the biological research program components.

38. The SRB **URGED** an in-depth conversation between the SRB and IPHC Secretariat on details of the biological research program prior to SRB013. In particular, the SRB is willing to provide specific advice and examples for how the IPHC Secretariat could:

    a) link current work on migration, growth, and physiological condition of Pacific halibut to spatial and temporal changes in productivity and connectivity.

    b) improve our understanding of (1) spawning site contributions to nursery/settlement areas in relation to year-class and recruit survival and strength and (2) the relationship between nursery/settlement origin and adult distribution and abundance over temporal and spatial scales.

    c) apply genetic approaches to address management-relevant questions on population structure, distribution, and recruitment.

39. The SRB **REQUESTED** that IPHC establish dedicated academic funding programs through which IPHC-funded university students participate in research activities.

40. The SRB continued to **URGE** that IPHC hire a life history modeller who could provide a new suite of skills that could bridge the gaps between empirical data, stock assessment, and operating model hypothesis generation.

7.2 Progress on ongoing research projects

41. The SRB **NOTED** paper IPHC-2018-SRB012-09 which detailed progress on research projects conducted by the Biological and Ecosystem Sciences Research Program.

7.2.1 Discard mortality rates

42. The SRB **NOTED** the progress, and looks forward to primary publication of, experimental measurements of discard mortality rates based on realistic field conditions and agreement between these and existing estimates. However, the precision of resulting DMR estimates (for Pacific halibut in Excellent condition) remain somewhat low because of small sample sizes.

7.2.2 Juvenile growth studies

43. The SRB refers to paragraph 38.

7.2.3 Reproductive assessment

44. The SRB **NOTED** genetic validation of at-sea marking of male and female halibut and the potentially important contributions that would make to improvements in the stock assessment.

7.3 Presentation of planned future research projects

7.3.1 Growth-thermal history

45. The SRB **ACKNOWLEDGED** the growth-thermal history and larval distribution and connectivity research and looks forward to future presentations on these results. In particular, this would be an excellent topic for the use of genetic data (see paragraph 38).

46. The SRB **NOTED** that, while considerable progress has been made in developing the biological research program over the past few years, there are research topics within the five-year research plan that could be expanded (see paragraph 38).

8. REVIEW OF THE DRAFT AND ADOPTION OF THE REPORT OF THE 12TH SESSION OF THE IPHC SCIENTIFIC REVIEW BOARD (SRB012)

47. The report of the 12th Session of the IPHC Scientific Review Board (IPHC-2018-SRB012-R) was **ADOPTED** on 21 June 2018, including the consolidated set of recommendations and/or requests arising from SRB012, provided at Appendix IV.

APPENDIX I
LIST OF PARTICIPANTS FOR THE 12TH SESSION OF THE IPHC SCIENTIFIC REVIEW BOARD (SRB012)

SRB Members

Dr Sean **Cox**:	spcox@sfu.ca; Associate Professor, School of Resource and Environmental Management, Simon Fraser University, 8888 University Dr., Burnaby, B.C., Canada V5A 1S6
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IPHC Secretariat

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APPENDIX II
AGENDA FOR THE 12TH SESSION OF THE IPHC SCIENTIFIC REVIEW BOARD (SRB012)

Date: 19–21 June 2018
Location: Seattle, Washington, U.S.A.
Venue: IPHC Board Room, Salmon Bay
Time: 12:00-17:00 (19th), 09:00-17:00 (20th), 09:00-14:00 (the 21st)
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. Update on the actions arising from the 11th Session of the SRB (SRB011) (D. Wilson)
- 3.2. Outcomes of the 94th Session of the IPHC Annual Meeting (AM094) (D. Wilson)
- 3.3. IPHC Rules of Procedure (2017): Proposed amendments (D. Wilson)
- 3.4. SRB annual workflow (D. Wilson)

4. IPHC FISHERY-INDEPENDENT SETLINE SURVEY (FISS)
- 4.1. Methods for spatial setline survey modelling – Program of work for 2018 (R. Webster)

5. PACIFIC HALIBUT STOCK ASSESSMENT: 2018
- 5.1. Data source development (I. Stewart)
- 5.2. Modelling updates (I. Stewart)

6. MANAGEMENT STRATEGY EVALUATION: UPDATE
- 6.1. Outcomes of MSAB011 (A. Hicks)
- 6.2. Updates to MSE framework and closed-loop simulations (A. Hicks)
- 6.3. MSAB Program of Work and delivery timeline for 2018 and beyond (A. Hicks)
- 6.4. Interim distribution procedures 2019-2020 (A. Hicks)

7. BIOLOGICAL AND ECOSYSTEM SCIENCE RESEARCH UPDATES
- 7.1. Five-year research plan and management implications (J. Planas)
- 7.2. Progress on ongoing research projects (J. Planas)
  - 7.2.1. Discard Mortality Rates
  - 7.2.2. Juvenile growth studies
  - 7.2.3. Reproductive assessment
- 7.3. Presentation of planned future research projects (J. Planas)
  - 7.3.1. Growth-thermal history
  - 7.3.2. Larval connectivity
  - 7.3.3. Others

8. REVIEW OF THE DRAFT AND ADOPTION OF THE REPORT OF THE 12TH SESSION OF THE IPHC SCIENTIFIC REVIEW BOARD (SRB012)

APPENDIX III
LIST OF DOCUMENTS FOR THE 12TH SESSION OF THE IPHC SCIENTIFIC REVIEW BOARD (SRB012)

Document	Title	Availability
IPHC-2018-SRB012-01	DRAFT: Agenda & Schedule for the 12th Session of the Scientific Review Board (SRB012)	✓ 16 Mar 2018
IPHC-2018-SRB012-02	DRAFT: List of Documents for the 12th Session of the Scientific Review Board (SRB012)	✓ 21 May 2018
IPHC-2018-SRB012-03	Update on the actions arising from the 11th Session of the SRB (SRB011) (IPHC Secretariat)	✓ 17 May 2018
IPHC-2018-SRB012-04	Update on the actions arising from the 94th Session of the Commission (AM094) (D. Wilson)	✓ 16 May 2018
IPHC-2018-SRB012-05	Methods for spatial setline survey modelling – Program of work for 2018 (R. Webster)	✓ 21 May 2018
IPHC-2018-SRB012-06	Data source development (I. Stewart)	✓ 17 May 2018
IPHC-2018-SRB012-07	Modelling updates (I. Stewart, A. Hicks)	✓ 21 May 2018
IPHC-2018-SRB012-08	Management Strategy Evaluation: Update for 2018 (A. Hicks, I. Stewart)	✓ 21 May 2018
IPHC-2018-SRB012-09	Report on current and future biological research activities (J. Planas)	✓ 21 May 2018
Information papers		
IPHC-2018-SRB012-INF01	NPRB1704 Grant Proposal	✓ 16 May 2018
IPHC-2018-SRB012-INF02	Saltonstall-Kennedy Grant Proposal	✓ 16 May 2018

APPENDIX IV
CONSOLIDATED SET OF RECOMMENDATIONS AND REQUESTS OF THE 12TH SESSION OF THE IPHC SCIENTIFIC REVIEW BOARD (SRB012)

RECOMMENDATIONS

(para. 8) **NOTING** that the core purpose of the SRB012 is to review progress on the IPHC scientific program, and to provide guidance for the delivery of products to the SRB013 in September 2018, the SRB **AGREED** that formal recommendations to the Commission would not be developed at the present meeting, but rather, these would be developed at the SRB013.

REQUESTS

Pacific halibut stock assessment: 2018 - Data source development

SRB012–Req.01 (para. 18) **NOTING** the "map" presentation showing Recent Trend and Current Status, the SRB **REQUESTED** the IPHC Secretariat to further code the symbols to indicate relative stock sizes. An example approach for time series was provided via email and code can be made available.

Modelling updates: Graphical and tabulation tools for presentation of currently implemented reference points, potentially including a phase plot

SRB012–Req.02 (para. 24) The SRB **NOTED** that the phase plot presentation showing historical stock status and fishing intensity is a common and informative way to present fishery status. However, the perception of fishery status depends on the choices for reference points (i.e. vertical and horizontal lines in the spawning biomass and fishing intensity dimensions, respectively) and corresponding zones. Therefore, the SRB **REQUESTED** that the plot not be coloured with discrete "stoplight" colours. It is important that the IPHC Secretariat make it clear to viewers that (1) that F46% is the implied fishing intensity given relatively recent catch history, and (2) that the implied biomass target associated with F46% is not at the crosshairs given in the plot.

Outcomes of MSAB011

SRB012–Req.03 (para. 28) With respect to the above two excerpts from IPHC-2017-SRB011-R, the SRB **AGREED** to the following clarifications:

a) *IPHC-2017-SRB011-R*, *paragraph 24* simply recognizes that perfect knowledge simulation will under-represent short- and medium-term risks to both the stock and fisheries that result from persistent stock assessment errors. The SRB also **NOTED** that *IPHC-2017-SRB011-R paragraph 24* does not imply concatenating short-term projections from the ensemble assessment model with long-term projections from the MSE.

b) The SRB **NOTED** that the original intent of *IPHC-2017-SRB011-R*, *paragraph 28* was to exclude OM states and parameters that resulted in quasi-extinction of the stock before 2017 and **REQUESTED** that, by SRB013, the IPHC Secretariat confirm that this problem no longer exists so that the full OM distribution can be used.

Updates to MSE framework and closed-loop simulations

SRB012–Req.04 (para. 33) The SRB **AGREED** that with respect to all of the topics listed above in paragraph 32, it cannot make an objective assessment of the appropriateness of choices and methods used in the MSE OM conditioning and projections in the absence of simulation results. The SRB **REQUESTED** a presentation of MSE simulation results by SRB013.

Five-year research plan and management implications

SRB012–Req.05 (para. 36) The SRB **NOTED** and was very pleased with the progress made integrating the biological, assessment, and MSE aspects of IPHC research, as well as the approach used to present this integration. The SRB further **REQUESTED** that the presentation approach be further developed and used to communicate IPHC research at future annual meetings.

SRB012–Req.06 (para. 37) The SRB **REQUESTED** that readers of this report to refer to paragraphs 46-72 from IPHC-2017-SRB010-R for in-depth background comments previously made on the biological research program components.

SRB012–Req.07 (para. 39) The SRB **REQUESTED** that IPHC establish dedicated academic funding programs through which IPHC-funded university students participate in research activities.