



## **Report of the 9<sup>th</sup> Session of the IPHC Management Strategy Advisory Board (MSAB09)**

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Seattle, Washington, U.S.A., 9-11 May 2017

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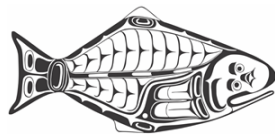
## ACRONYMS

CDN	Canada
EM	Estimation Model
FCEY	Fishery Constant Exploitation Yield
F <sub>SPR</sub>	The Fishing Intensity that results in an equilibrium Spawning Potential Ratio
HCR	Harvest Control Rule
IPHC	International Pacific Halibut Commission
LRP	Limit Reference Point
M	Natural Mortality
MSAB	Management Strategy Advisory Board
OM	Operating Model
RSB	Relative Spawning Biomass
SRB	Scientific Review Board
SPR	Spawning Potential Ratio
TCEY	Total Constant Exploitation Yield
TRP	Threshold/Trigger Reference Point
TM	Total mortality
U.S.A.	United States of America
WPUE	Weight-Per-Unit-Effort

## HOW TO INTERPRET TERMINOLOGY CONTAINED IN THIS REPORT

The MSAB09 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 the Commission, a Contracting Party, a subsidiary (advisory) body of the Commission and/or the IPHC Secretariat. *Note:* Subsidiary (advisory) bodies of the Commission must have their Recommendations and Requests formally provided to the next level in the structure of the Commission for its consideration/endorsement (e.g. from an Advisory Board to the Commission). The intention is that the higher body will consider the action for endorsement under its own mandate, if the subsidiary body does not already have the required mandate. Ideally, this should be task-specific and contain a timeframe for completion.
- Level 2: AGREED:** Any point of discussion from a meeting, which the IPHC 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/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 IPHC 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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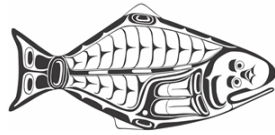
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## EXECUTIVE SUMMARY

The 9<sup>th</sup> Session of the International Pacific Halibut Commission (IPHC) Management Strategy Advisory Board (MSAB09) was held in Seattle, Washington, U.S.A. from 9 to 11 May 2017. The MSAB consists of 20 board members, 17 of which attended the Session from the two (2) Contracting Parties. A total of four (4) individuals attended the Session as Observers. In addition, two (2) IPHC Commissioners were in attendance, Mr Paul Ryall (Canada) and Mr Bob Alverson (U.S.A.). The meeting was opened by the Co-Chairpersons, Mr Adam Keizer (Canada) and Ms Michele Culver (U.S.A.).

The following are a subset of the complete recommendations/requests for action from the MSAB09, which are provided at [Appendix VII](#).

## RECOMMENDATIONS

**NOTING** that the core purpose of the MSAB09 is to review progress on the MSE Program of Work, and to provide guidance for the delivery of products to the MSAB10 in October 2017, the MSAB **AGREED** that formal recommendations to the Commission would not be developed at the present meeting, but rather, these would be developed at the MSAB10.

## REQUESTS

### **MSAB Program of Work and delivery schedule for 2017**

MSAB09-Req.01 ([para. 15](#)) The MSAB **REQUESTED** that the MSE Program of Work and delivery schedule be expanded past the current 2018 timeframe, to provide a three-year outlook, thereby detailing the work to be completed and delivery times, noting that the Commission has directed the IPHC Secretariat to accelerate the process as follows:

AM093-Rec.07 (para. 39) *“The Commission RECOMMENDED that the IPHC Management Strategy Evaluation (MSE) process be accelerated so that more of the elements contained within the current Program of Work are delivered at the 94th Annual Meeting of the Commission in 2018. The IPHC Secretariat is directed to mobilise carryover funds from “core operations” to ensure the accelerated delivery schedule.”*

### **Harvest strategy policy: Framework**

MSAB09-Req.02 ([para. 21](#)) The MSAB **REQUESTED** that the IPHC Secretariat staff move forward by using a coastwide Operating Model with five coastwide fleets, as in the coastwide assessment models. A coastwide model lacks complexity but has utility for investigating coastwide fishing intensity.

### **Harvest strategy policy: Management procedures**

MSAB09-Req.03 ([para. 28](#)) The MSAB **REQUESTED** that:

- a)  $F_{SPR}$  be analysed as the primary metric of fishing intensity, over a range of values, and that several other fishing intensity metrics described in paper IPHC-2017-MSAB09-07 be reported as performance metrics. [Table 2](#) describes the specific Management Procedures and values in priority order that should be evaluated.
- b) further evaluation of the harvest control rule described in paper IPHC-2017-MSAB09-07 be undertaken, with  $F_{SPR}$  as the object of the control rule's actions, but including a nominal amount of bycatch and personal use catch (based on realistic expectations from the fishery) when  $F_{SPR}$  is set to zero by the control rule. [Table 2](#) describes the specific Management Procedures and values in priority order that should be evaluated.



- c) simulation sensitivities, as described in [Table 2](#), be evaluated for a selection of specific combinations of Management Procedures.

***Goals, objectives, and performance metrics***

MSAB09–Req.04 ([para. 33](#)) The MSAB **REQUESTED** that performance metrics be reported for short-, medium-, and long-term timeframes. Long-term timeframes would be at least 50 to 60 years, and other timeframes will be considered in consultation with the IPHC’s Scientific Review Board.

MSAB09–Req.05 ([para. 35](#)) The MSAB **REQUESTED** that the goals and objectives provided at [Appendix VI](#) be used for the IPHC Secretariat’s analysis to be prepared for MSAB10, **NOTING** that, although objectives for the overarching goals concerning bycatch, consumer needs, and preserving biocomplexity have not yet been identified, those goals would be addressed at least partially by other elements of the analysis.



## 1. OPENING OF THE SESSION

1. The 9<sup>th</sup> Session of the International Pacific Halibut Commission (IPHC) Management Strategy Advisory Board (MSAB09) was held in Seattle, Washington, U.S.A. from 9 to 11 May 2017. The MSAB consists of 20 board members, 17 of which attended the Session from the two (2) Contracting Parties. A total of four (4) individuals attended the Session as Observers. In addition, two (2) IPHC Commissioners were in attendance, Mr Paul Ryall (Canada) and Mr Bob Alverson (U.S.A.). The list of participants is provided at [Appendix I](#). The meeting was opened by the Co-Chairpersons, Mr Adam Keizer (Canada) and Ms Michele Culver (U.S.A.), who welcomed participants to Seattle.
2. The MSAB **NOTED** apologies received from the following board members: Mr Chris Sporer (CDN commercial harvester rep.), Mr Robert Hauknes (CDN commercial harvester rep.) and Ms Rachel Baker (U.S.A. government Rep.).
3. The MSAB **RECALLED** the importance for all members to attend each Session of the MSAB, both to be fully engaged in the process and to fulfil fishery sector representation.
4. **NOTING** that the core purpose of the MSAB09 is to review progress on the MSE Program of Work, and to provide guidance for the delivery of products to the MSAB10 in October 2017, the MSAB **AGREED** that formal recommendations to the Commission would not be developed at the present meeting, but rather, these would be developed at the MSAB10.

## 2. ADOPTION OF THE AGENDA AND ARRANGEMENTS FOR THE SESSION

5. The MSAB **ADOPTED** the Agenda as provided at [Appendix II](#). The documents provided to the MSAB09 are listed in [Appendix III](#).

## 3. IPHC PROCESS

### 3.1 *IPHC Rules of Procedure (2017)*

6. The MSAB **NOTED** that at its 93<sup>rd</sup> Session, the Commission adopted revised IPHC Rules of Procedure (2017) by consensus. The document is available for download from the IPHC website: <http://iphc.int/basic-texts-of-the-commission.html>.
7. The MSAB **NOTED** the modifications adopted by the Commission, including the MSAB membership, reporting requirements, and other governance improvements.

### 3.2 *2017 MSAB membership*

8. The MSAB **NOTED** paper IPHC-2017-MSAB09-06 which detailed the inter-sessional decision-making process undertaken to provide the Commission with an opportunity to review and subsequently approve an MSAB membership list for 2017.
9. The MSAB **NOTED** that in accordance with the Terms of Reference and Rules of Procedure of the MSAB, as detailed in Appendix V (Section II, paragraphs 3-4) of the IPHC Rules of Procedure (2017), the MSAB is required to maintain a diverse membership to ensure representation of core stakeholder groups and regulatory areas.
10. The MSAB **NOTED** that on 21 March 2017, the Commission approved the MSAB membership list as provided in [Appendix IV](#), including three new members (Mr Martin Paish (CDN recreational/sport rep.), Mr Robert Hauknes (CDN commercial harvester rep.), and Mr Dan Falvey (U.S.A. commercial harvester rep.)).

### 3.3 *Update on the actions arising from the 8<sup>th</sup> Session of the MSAB (MSAB08)*

11. The MSAB **NOTED** paper IPHC-2017-MSAB09-03 which provided an opportunity to consider the progress made during the inter-sessional period since the MSAB08 meeting held in October 2016.



12. The MSAB **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 MSAB09 into a consolidated list of recommendations and requests for future reporting.

### 3.4 *Outcomes of the 93<sup>rd</sup> Session of the IPHC Annual Meeting (AM093)*

13. The MSAB **NOTED** paper IPHC-2017-MSAB09-04 which outlined the main outcomes of the 93<sup>rd</sup> Session of the Commission, specifically related to the MSAB, and **AGREED** to consider how best to provide the Commission with the information it has requested, throughout the course of the current MSAB meeting.

### 3.5 *MSAB Program of Work and delivery schedule for 2017*

14. The MSAB **NOTED** paper IPHC-2017-MSAB09-05, which provided a description of activities related to the MSAB that IPHC Secretariat staff will engage in for the next two years, including priority tasks, the resources needed for each task, and a timeline for each task.
15. The MSAB **REQUESTED** that the MSE Program of Work and delivery schedule be expanded past the current 2018 timeframe, to provide a three-year outlook, thereby detailing the work to be completed and delivery times, noting that the Commission has directed the IPHC Secretariat to accelerate the process as follows:

AM093–Rec.07 (para. 39) “*The Commission RECOMMENDED that the IPHC Management Strategy Evaluation (MSE) process be accelerated so that more of the elements contained within the current Program of Work are delivered at the 94th Annual Meeting of the Commission in 2018. The IPHC Secretariat is directed to mobilise carryover funds from “core operations” to ensure the accelerated delivery schedule.*”

16. **NOTING** the revised accelerated delivery schedule, for the MSE Program of Work (2016-20) provided at [Appendix V](#), the MSAB **AGREED** that the details post-2017 would be considered at the MSAB10 in October 2017, prior to submission to the Commission.

## 4. HARVEST STRATEGY POLICY, PART 1: SIMULATIONS TO EVALUATE FISHING INTENSITY

17. The MSAB **NOTED** paper IPHC-2017-MSAB09-07 which aimed to inform and stimulate discussion about the framework and inputs to the closed-loop simulations used to investigate measures of and specific values for fishing intensity (e.g. F<sub>SPR</sub>).
18. The MSAB **NOTED** that fishing intensity defines the coastwide scale of fishing, and that these simulations will help to determine a specific fishing intensity that will best meet the objectives defined by the MSAB.

### 4.1 *Framework*

19. The MSAB **NOTED** that there are four main modules to the closed-loop simulation framework:
- The **Operating Model** (OM) is a representation of the population and the fishery. It produces the numbers-at-age, accounting for mortality and any other important processes, and also incorporates uncertainty in the processes.
  - Monitoring** (data generation) is the code that simulates the data from the Operating Model that is used by the Estimation Model. It can introduce variability, bias, and any other properties that are desired. The data to be generated are dictated by the Estimation Model and Harvest Strategy decisions.
  - The **Estimation Model** (EM), which can range from simple trend analysis to, in this case, a model similar to a full stock assessment. Using the data generated, it provides the basis for setting the catch levels for the next time step.





- d) **Harvest Strategy** is the application of the estimation model output along with the scale and IPHC Regulatory Area distribution procedures to produce the catch limit for that year, that is then applied to the Operating Model.
20. **NOTING** the suggestions provided for defining the Operating Model, the MSAB **AGREED** that using the Stock Synthesis framework, as in the current IPHC stock assessment, provides an efficient way to conduct the simulations and uses a model that is conditioned to data and generally understood.
21. The MSAB **REQUESTED** that the IPHC Secretariat staff move forward by using a coastwide Operating Model with five coastwide fleets, as in the coastwide assessment models. A coastwide model lacks complexity but has utility for investigating coastwide fishing intensity.
22. The MSAB **AGREED** that:
- a) the Estimation Model include a Perfect Information case to illustrate the best performance that a management strategy could obtain given the uncertainty in the Operating Model. Additionally, the Estimation Model should also include a model to mimic the level of uncertainty in the current stock assessment process.
  - b) distributing the Total Mortality to the five fleets be treated as a Scenario with uncertainty.
23. The MSAB **NOTED** that:
- a) Data Generation specifications are mostly a science product to be discussed with the IPHC Scientific Review Board, rather than the MSAB.
  - b) Data Generation assumptions are consistent with current data collection, but potential changes to data collection (such as sex-specific fishery observations) may be considered.

#### 4.2 Scenarios

24. The MSAB **NOTED** that scenarios represent both uncertainty (in the form of distributions) as well as alternative states of nature in the Operating Model, which reflect parameter and structural uncertainty. These alternative states of nature integrate over the uncertainty in the system that we cannot, or choose not to, control. The scenarios for the MSE simulations may include uncertainty in the processes, as detailed in [Table 1](#).

**Table 1.** Scenarios for the MSE simulations.

Process	Uncertainty
Natural Mortality (M)	From assessment
Recruitment	Random, lognormal deviations, variability=0.5-0.65
Size-at-age	Trend in size-at-age (random walk)
Maturity-at-age	Variable a50; function of size-at-age?
Steepness	Variability in OM: $N(0.75, \sigma=0.1)$
Regime Shifts	Autocorrelated index as indicator for regime shift
Fishery Selectivity	Time-varying, consistent with estimated variability
Survey Selectivity	Time-varying, consistent with estimated variability
WPUE catchability	Random walk as estimated
Survey catchability	Constant
Total Mortality to sectors (e.g. bycatch)	Described below in <a href="#">paragraph 25</a>
Proportion of Total Mortality taken	Sector-specific

25. The MSAB **NOTED** that catch history, in conjunction with uncertainties and sensitivities, can be used to attribute Total Mortality (TM) to each sector. There are also concerns about parameter values and management processes at the scenario extremes, such as when the stock level approaches 20%SB<sub>0</sub> and



directed fishing is stopped, but other harvest might continue, but that this would not impede the analysis and is addressed, in part, in paragraph 28(b).

26. The MSAB **AGREED** that the IPHC Secretariat staff continue with refinement of the scenario approach described in paper IPHC-2017-MSAB09-07, including consultation with the IPHC Scientific Review Board.

**4.3 Management Procedures**

27. The MSAB **NOTED** the possibilities for Management Procedures presented in paper IPHC-2017-MSAB09-07 and focused its attention on metrics of fishing intensity and control rules in order to guide the IPHC Secretariat’s Program of Work (2017-20). The MSE will grow incrementally from this first iteration of Management Procedure simulation, to refine initial results and incorporate new procedures in subsequent iterations.

28. The MSAB **REQUESTED** that:

- a)  $F_{SPR}$  be analysed as the primary metric of fishing intensity, over a range of values, and that several other fishing intensity metrics described in paper IPHC-2017-MSAB09-07 be reported as performance metrics. [Table 2](#) describes the specific Management Procedures and values in priority order that should be evaluated.
- b) further evaluation of the harvest control rule described in paper IPHC-2017-MSAB09-07 be undertaken, with  $F_{SPR}$  as the object of the control rule’s actions, but including a nominal amount of bycatch and personal use catch (based on realistic expectations from the fishery) when  $F_{SPR}$  is set to zero by the control rule. [Table 2](#) describes the specific management procedures and values in priority order that should be evaluated.
- c) simulation sensitivities, as described in [Table 2](#), be evaluated for a selection of specific combinations of Management Procedures.

**Table 2** Management Procedures and values, in priority order, to be used by the IPHC Secretariat staff for evaluation.

Management Procedure	Values
SPR	0.25 – 0.60, higher density near 46%
Control Rule	30:20, 40:20 threshold/trigger and limit, respectively
Ceiling on Total Mortality	85 MIbs
Floor on Total Mortality	30 MIbs
Sensitivity	Values
Size-at-age	High and low states
Recruitment	High and low states
Maximum bycatch	At per-area maximum regulatory bycatch
Bycatch selectivity	Shifted to a greater proportion of U26 fish
Uncertainty in total mortality	Unknown

29. The MSAB **NOTED** that not all simulation scenarios can be evaluated for all sensitivities, but that sensitivities will be employed to spotlight their most salient effects.

**4.4 Example of presenting results**

30. The MSAB **AGREED** that this agenda item would be combined with item [5.3 Reporting results for evaluation](#), below.



## 5. GOALS, OBJECTIVES, AND PERFORMANCE METRICS

31. The MSAB **NOTED** paper IPHC-2017-MSAB09-08 Rev\_2 which provided a review of the goals and objectives previously defined by the MSAB, a number of possible performance metrics to be evaluated, and a list of actions previously requested by the MSAB.
32. The MSAB **NOTED** that performance metrics can be developed from a measurable objective with an outcome, timeframe, and probability defined, and that these performance metrics have already been defined for most objectives.
33. The MSAB **REQUESTED** that performance metrics be reported for short-, medium-, and long-term timeframes. Long-term timeframes would be at least 50 to 60 years, and other timeframes will be considered in consultation with the IPHC's Scientific Review Board.

### 5.1 *Further clarifying objectives*

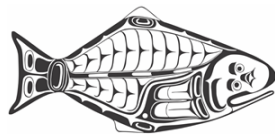
34. The MSAB **CONSIDERED** the goals and objectives presented in paper IPHC-2017-MSAB09-08 Rev\_2, as well as possible additions or deletions.
35. The MSAB **REQUESTED** that the goals and objectives provided at [Appendix VI](#) be used for the IPHC Secretariat's analysis to be prepared for MSAB10, **NOTING** that, although objectives for the overarching goals concerning bycatch, consumer needs, and preserving biocomplexity have not yet been identified, those goals would be addressed at least partially by other elements of the analysis.
36. The MSAB **AGREED** that:
  - a) the objective to maintain a minimum absolute number of female Pacific halibut coastwide may be a useful objective, because it would remain static, especially if a dynamic RSB will be used to determine the current status of the stock for use in the control rule.
  - b) the objective to maintain a minimum spawning stock biomass will be rephrased into two objectives, 1) avoid very low stock sizes, and 2) mostly avoid low stock sizes, which would use the limit and threshold (trigger) reference points (LRP, TRP) as outcomes, respectively.
  - c) the objectives related to wastage are already being met and do not need to be specifically considered in these simulations, and that a statement should be made that these objectives are currently met. As per paragraph 37(b), a statistic regarding wastage may still be reported.

### 5.2 *Useful performance metrics*

37. The MSAB **AGREED**:
  - a) to report on the performance metrics provided at [Appendix VI](#).
  - b) that since a desired minimum number of mature female Pacific halibut has not been defined, a performance metric reporting a statistic (e.g. average) of the number of mature females be provided.
  - c) that a proxy metric for FCEY should be the sum of the commercial, wastage, sport and personal use mortality.
  - d) that the following performance metrics should be reported to help evaluate the expectations of the simulation model: 1) percentage of bycatch relative to the total mortality, and 2) the weight of the bycatch.

### 5.3 *Reporting results for evaluation*

38. The MSAB **NOTED** that the goal of the simulations is to produce metrics for multiple Management Procedures which can be evaluated against the objectives defined by the MSAB. A table is a common way to display these metrics, but figures may be useful to evaluate trade-offs between objectives.



39. **NOTING** the examples for presenting results described by the IPHC Secretariat staff, the MSAB **AGREED** that they be used as the starting point for presenting results to MSAB10 (October 2017), and offered comments and suggestions for their use as a table with Management Procedures as columns and performance statistics as rows.

40. The MSAB **AGREED** that when reporting simulation results, the format should include simple, clear naming conventions, performance metrics should be reported in smaller sets with trade-offs still obvious, and an easy to identify symbol should be used when a measurable objective is met. In addition, plots of the time series, plots of specific simulation trajectories, and box plots showing quantiles may be useful.

## 6. HARVEST STRATEGY POLICY, PART 2: ADDRESSING STOCK AND CATCH DISTRIBUTION

41. The MSAB **NOTED** paper IPHC-2017-MSAB09-09, which aimed to stimulate discussion about alternatives to distribute the TCEY in the current harvest strategy policy, noting that the Commission has directed the IPHC Secretariat to initiate a process as follows:

AM093–Req.02 ([para. 40](#)) “*The Commission REQUESTED that the IPHC Secretariat initiate a process to develop alternative, biologically based stock distribution strategies for consideration by the Commission and its subsidiary bodies. This should also be incorporated into the MSE Program of Work.*”

42. The MSAB **NOTED** a Harvest Strategy and terms to describe the Harvest Strategy Policy, specifically the distribution component, and **AGREED** to continue development of this Harvest Strategy and the terms to describe the components for further consideration at the MSAB10.

43. The MSAB **AGREED** that there are separate components, science (e.g. stock distribution) and management-focused, associated with distributing the TCEY when describing the harvest strategy policy. Management components may include different harvest rates in each Regulatory Area (or region), trends in fishery WPUE, age/size compositions, national shares, or simple allocations.

44. The MSAB **NOTED** the proposed alternatives for distributing the TCEY (pseudo-status quo and regional distribution) to evaluate in the future using the MSE framework.

45. The MSAB **CONSIDERED** the proposal for stock distribution to operate on the regions defined in paper IPHC-2017-MSAB09-09.

46. The MSAB **AGREED** to further consider a goal related to preserving biocomplexity at MSAB10.

## 7. DELIVERABLES FOR MSAB10 AND FOR THE 2018 ANNUAL MEETING (AM094)

47. The MSAB **REQUESTED** that the following items be delivered by the IPHC Secretariat staff to the MSAB10 for further consideration, prior to their delivery to the Commission at AM094:

- a) Simulation results of Management Procedure evaluation including sensitivity analysis.
- b) Terms and Definitions for a refined Harvest Strategy Policy.
- c) Updates on the Scientific Review Board discussions/recommendations on stock distribution, biocomplexity, and performance metric timeframes.
- d) Updated MSE Program of Work (2016-20).
- e) Updates on other pertinent work.

## 8. OTHER BUSINESS

### 8.1 Election of Co-Chairpersons for the next biennium

48. The MSAB **NOTED** that the terms of the current Co-Chairpersons, Mr Adam Keizer (Canada) and Ms Michele Culver (U.S.A.) are due to expire at the closing of the current Session, and in accordance with the IPHC Rules of Procedure (2017) (Rule 14, paragraph 7(b)), the MSAB is required to elect or re-elect new Co-Chairpersons for the next biennium.



49. The MSAB **CALLED** for nominations for the positions of Co-Chairpersons of the IPHC MSAB for the next biennium. Mr Adam Keizer (Canada) and Ms Rachel Baker (U.S.A.) were nominated, seconded and elected as Co-Chairpersons of the IPHC MSAB for the next biennium.

**8.2 Election of the Steering Committee for the next biennium**

50. The MSAB **NOTED** that in accordance with the Terms of Reference and Rules of Procedure of the MSAB, as detailed in Appendix V (Section V, paragraph 10) of the IPHC Rules of Procedure (2017), the MSAB is required to elect or re-elect members of the MSAB Steering Committee for the next biennium.

51. The MSAB **CALLED** for nominations to the MSAB Steering Committee for the next biennium. The following list was nominated, seconded and elected as members of the MSAB Steering Committee for the next biennium:

<b>Canada</b>	<b>United States of America</b>
Mr Adam Keizer	Ms Rachel Baker
Mr Jim Lane	Ms Michele Culver
Mr Chris Sporer	Ms Peggy Parker

**8.3 IPHC meetings calendar (2017-19): MSAB**

52. **NOTING** the annual IPHC meetings calendar (2017-19) adopted by the Commission at its 93<sup>rd</sup> Session in 2017, and the revised MSE Program of Work discussed during the current meeting, the MSAB **AGREED** that moving forward, the May MSAB meetings should move to a three (3) day format and the October MSAB meeting should move to a three (3) or four (4) day format, dependent on content. MSAB10 will commence on Monday 23 October 2017 (noon) and close on Thursday 26 October 2017, 5:00pm.

**9. REVIEW OF THE DRAFT AND ADOPTION OF THE REPORT OF THE 9<sup>TH</sup> SESSION OF THE IPHC MANAGEMENT STRATEGY ADVISORY BOARD (MSAB)**

53. The report of the 9<sup>th</sup> Session of the IPHC Management Strategy Advisory Board (IPHC-2017-MSAB09–R) was **ADOPTED** via correspondence on 19 May 2017, including the consolidated set of recommendations and/or requests arising from MSAB09, provided at [Appendix VII](#).

**APPENDIX I**  
**LIST OF PARTICIPANTS FOR THE 9<sup>TH</sup> SESSION OF THE IPHC MANAGEMENT STRATEGY**  
**ADVISORY BOARD (MSAB09)**

**Officers**

Co-Chairperson (Canada)	Co-Chairperson (United States of America)
Mr Adam <b>Keizer</b> : <a href="mailto:adam.keizer@dfo-mpo.gc.ca">adam.keizer@dfo-mpo.gc.ca</a>	Ms Michele <b>Culver</b> : <a href="mailto:Michele.Culver@dfw.wa.gov">Michele.Culver@dfw.wa.gov</a>

**MSAB Members**

Canada	United States of America
Dr Robyn <b>Forrest</b> : <a href="mailto:Robyn.Forrest@dfo-mpo.gc.ca">Robyn.Forrest@dfo-mpo.gc.ca</a>	Mr Craig <b>Cross</b> : <a href="mailto:craigc@starboats.com">craigc@starboats.com</a>
Mr Adam <b>Keizer</b> : <a href="mailto:adam.keizer@dfo-mpo.gc.ca">adam.keizer@dfo-mpo.gc.ca</a>	Ms Michele <b>Culver</b> : <a href="mailto:Michele.Culver@dfw.wa.gov">Michele.Culver@dfw.wa.gov</a>
Mr Jim <b>Lane</b> : <a href="mailto:jim.lane@nuuchahnulth.org">jim.lane@nuuchahnulth.org</a>	Mr Dan <b>Falvey</b> : <a href="mailto:myriadfisheries@gmail.com">myriadfisheries@gmail.com</a>
Mr Brad <b>Mirau</b> : <a href="mailto:brad@aerotrading.ca">brad@aerotrading.ca</a>	Mr Bruce <b>Gabrys</b> : <a href="mailto:gabryscpa@mtaonline.net">gabryscpa@mtaonline.net</a>
Mr Martin <b>Paish</b> : <a href="mailto:martinpaish1@gmail.com">martinpaish1@gmail.com</a>	Mr Jeff <b>Kaufman</b> : <a href="mailto:jeff@spfishco.com">jeff@spfishco.com</a>
	Mr Tom <b>Marking</b> : <a href="mailto:tmmarking@gmail.com">tmmarking@gmail.com</a>
	Mr Scott <b>Mazzone</b> : <a href="mailto:smazzone@quinault.org">smazzone@quinault.org</a>
	Dr Carey <b>McGillard</b> : <a href="mailto:Carey.McGilliard@noaa.gov">Carey.McGilliard@noaa.gov</a>
	Mr Scott <b>Meyer</b> : <a href="mailto:scott.meyer@alaska.gov">scott.meyer@alaska.gov</a>
	Mr Per <b>Odegaard</b> : <a href="mailto:vanseeeodegaard@hotmail.com">vanseeodegaard@hotmail.com</a>
	Ms Peggy <b>Parker</b> : <a href="mailto:peggyparker616@gmail.com">peggyparker616@gmail.com</a>
	Mr John <b>Woodruff</b> : <a href="mailto:johnw@icicleseafoods.com">johnw@icicleseafoods.com</a>
Absentees	Absentees
Mr Chris <b>Sporer</b> : <a href="mailto:chris.sporer@phma.ca">chris.sporer@phma.ca</a>	Ms Rachel <b>Baker</b> : <a href="mailto:rachel.baker@noaa.gov">rachel.baker@noaa.gov</a>
Mr Robert <b>Hauknes</b> : <a href="mailto:robert_hauknes@hotmail.com">robert_hauknes@hotmail.com</a>	

**Commissioners**

Canada	United States of America
Mr Paul <b>Ryall</b> : <a href="mailto:Paul.Ryall@dfo-mpo.gc.ca">Paul.Ryall@dfo-mpo.gc.ca</a>	Mr Robert <b>Alverson</b> : <a href="mailto:roberta@fvoa.org">roberta@fvoa.org</a>

**Observers**

Canada	United States of America
	Ms Ruth <b>Christiansen</b> , United Catcher Boats
	Mr Jim <b>Hasbrouck</b> , ADFG
	Ms Kristin <b>Marshall</b> , NMFS
	Mr Frank <b>Lockhart</b> , NMFS

**IPHC Secretariat**

Name	Position and email
Dr David <b>Wilson</b>	Executive Director, <a href="mailto:david@iphc.int">david@iphc.int</a>
Mr Stephen <b>Keith</b>	Assistant Director, <a href="mailto:steve@iphc.int">steve@iphc.int</a>
Dr Allan <b>Hicks</b>	Quantitative Scientist, <a href="mailto:allan@iphc.int">allan@iphc.int</a>
Dr Ian <b>Stewart</b>	Quantitative Scientist, <a href="mailto:ian@iphc.int">ian@iphc.int</a>



**APPENDIX II**  
**AGENDA FOR THE 9<sup>TH</sup> SESSION OF THE IPHC MANAGEMENT STRATEGY ADVISORY BOARD**  
**(MSAB09)**

**Date:** 9–11 May 2017

**Location:** Seattle, Washington, U.S.A.

**Venue:** IPHC Training Room, Salmon Bay

**Time:** 09:00-17:00 daily

**Co-Chairpersons:** Mr Adam Keizer (Canada) and Ms Michele Culver (U.S.A.)

**1. OPENING OF THE SESSION**

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

**3. IPHC PROCESS**

- 3.1. IPHC Rules of Procedure (2017)
- 3.2. 2017 MSAB membership
- 3.3. Update on the actions arising from the 8<sup>th</sup> Session of the MSAB (MSAB08)
- 3.4. Outcomes of the 93<sup>rd</sup> Session of the IPHC Annual Meeting (AM093)
- 3.5. MSAB program of work and delivery schedule for 2017

**4. HARVEST STRATEGY POLICY, PART 1: SIMULATIONS TO EVALUATE FISHING INTENSITY**

- 4.1. Framework
- 4.2. Scenarios
- 4.3. Management procedures
- 4.4. Example of presenting results

**5. GOALS, OBJECTIVES, AND PERFORMANCE METRICS**

- 5.1. Further clarifying objectives
- 5.2. Useful performance metrics
- 5.3. Reporting results for evaluation

**6. HARVEST STRATEGY POLICY, PART 2: ADDRESSING STOCK AND CATCH DISTRIBUTION**

**7. DELIVERABLES FOR MSAB10 AND FOR THE 2018 ANNUAL MEETING (AM094)**

**8. OTHER BUSINESS**

- 8.1. Election of Co-Chairpersons for the next biennium
- 8.2. Election of the Steering Committee for the next biennium
- 8.3. IPHC meetings calendar (2017-19): MSAB

**9. REVIEW OF THE DRAFT AND ADOPTION OF THE REPORT OF THE 9<sup>th</sup> SESSION OF THE IPHC MANAGEMENT STRATEGY ADVISORY BOARD (MSAB09)**



**APPENDIX III**  
**LIST OF DOCUMENTS FOR THE 9<sup>TH</sup> SESSION OF THE MANAGEMENT STRATEGY ADVISORY BOARD (MSAB09)**

<b>Document</b>	<b>Title</b>	<b>Availability</b>
IPHC-2017-MSAB09-01	Agenda & Schedule for the 9 <sup>th</sup> Session of the IPHC Management Strategy Advisory Board (MSAB09)	✓ 7 Apr 2017 ✓ 9 May 2017
IPHC-2017-MSAB09-02	List of Documents for the 9 <sup>th</sup> Session of the IPHC Management Strategy Advisory Board (MSAB09)	✓ 7 Apr 2017 ✓ 9 May 2017
IPHC-2017-MSAB09-03	Update on the actions arising from the 8 <sup>th</sup> Session of the IPHC Management Strategy Advisory Board (MSAB08) (IPHC Secretariat)	✓ 29 Mar 2017
IPHC-2017-MSAB09-04	Outcomes of the 93 <sup>rd</sup> Session of the IPHC Annual Meeting (AM093) (IPHC Secretariat)	✓ 7 Apr 2017
IPHC-2017-MSAB09-05	MSAB program of work and delivery schedule for 2017 (A. Hicks)	✓ 7 Apr 2017
IPHC-2017-MSAB09-06	2017 MSAB Membership (S. Keith)	✓ 22 Mar 2017
IPHC-2017-MSAB09-07	Simulations to evaluate F <sub>SPR</sub> (A. Hicks)	✓ 24 Apr 2017
IPHC-2017-MSAB09-08 Rev_2	Goals, Objectives, and Performance Metrics defined by the Management Strategy Advisory Board (MSAB) (A. Hicks)	✓ 28, 30 Apr 2017 ✓ 8 May 2017
IPHC-2017-MSAB09-09	Ideas on stock and catch distribution (A. Hicks)	✓ 24 Apr 2017
<b><i>Information papers</i></b>		
IPHC-2017-MSAB09-INF01	MSAB08 Meeting Minutes	✓ 28 Nov 2016
IPHC-2017-MSAB09-INF02	IPHC Rules of Procedure (2017)	✓ 28 Feb 2017
IPHC-2017-MSAB09-INF03	MSAB Summary 2013-2017	✓ 7 Apr 2017
IPHC-2017-MSAB09-INF04	SharePoint Information	✓ 7 Apr 2017
IPHC-2017-MSAB09-INF05	MSE Best Practices paper	✓ 29 Mar 2017
IPHC-2017-MSAB09-INF06	MSAB09 Agenda Notes	✓ 7 Apr 2017





**APPENDIX IV**  
**MSAB MEMBERSHIP: DESIGNATIONS AND TERMS**  
*(As of 09 May 2017)*

<b>Membership category</b>	<b>Member</b>	<b>Canada</b>	<b>U.S.A.</b>	<b>Current Term commencement</b>	<b>Current Term expiration *</b>	<b>Notes</b>
<b>Harvesters (6-8)</b>						
1	Gabrys, Bruce		US Commercial	9-May-17	2021	
2	Kauffman, Jeff		US Commercial	9-May-17	2019	
3	Odegaard, Per		US Commercial	9-May-17	2021	
4	Falvey, Dan		US Commercial	9-May-17	2021	
5	Sporer, Chris	CDN Commercial		9-May-17	2021	
6	Hauknes, Robert	CDN Commercial		9-May-17	2021	
7						
8						
<b>First Nations/Tribal fisheries (2-4)</b>						
1	Lane, Jim	CDN First Nations		9-May-17	2021	
2	Mazzone, Scott		US Treaty Tribes	9-May-17	2019	
3						
4						
<b>Government Agencies (4-8)</b>						
1	Keizer, Adam	DFO		9-May-17	2019	
2	Baker, Rachel		NMFS	9-May-17	2019	
3	Forrest, Robyn	CDN Science Advisor		9-May-17	2021	
4	McGilliard, Carey		US Science Advisor	9-May-17	2021	
5	Culver, Michele		PFMC	9-May-17	2021	
6	Cross, Craig		NPFMC	9-May-17	2021	
7	Meyer, Scott		ADFG	9-May-17	2021	Note 1
8						

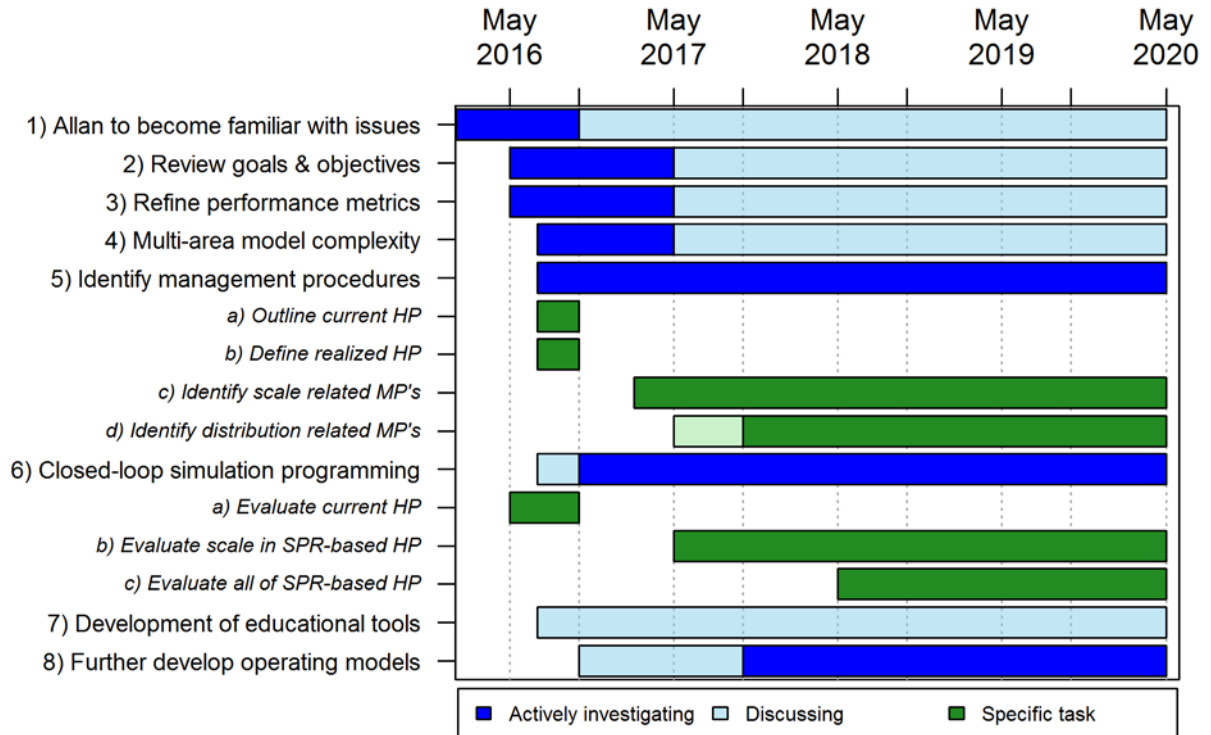


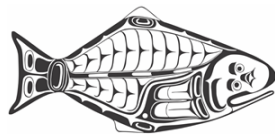
Membership category	Member	Canada	U.S.A.	Current Term commencement	Current Term expiration *	Notes
<b>Processors (2-4)</b>						
1	Parker, Peggy	US/CDN Processing	US/CDN Processing	9-May-17	2019	
2	Woodruff, John		US Processing	9-May-17	2019	
3	Mirau, Brad	CDN Processing		9-May-17	2019	
4						
<b>Recreational/Sport fisheries (2-4)</b>						
1	Marking, Tom		US Sportfishing (CA)	9-May-17	2019	
2	Paish, Martin	CDN Sport Fishing Advisory Board		9-May-17	2021	
3						
4						

\* MSAB member terms begin and end at the start of the first MSAB meeting of the year  
 Note 1 Expect ADFG to propose replacement when Meyer retires



**APPENDIX V**  
**MSE PROGRAM OF WORK (2016-20): TIMELINE**

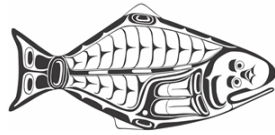




**APPENDIX VI  
GOALS, OBJECTIVES AND PERFORMANCE METRICS**

<b>Biological Sustainability</b>				
<b>Measurable Objective</b>	<b>Outcome</b>	<b>Time-frame</b>	<b>Probability</b>	<b>Performance Metrics</b>
Maintain a minimum of number of mature female halibut coast-wide	Number of mature female halibut less than a threshold	10 year period, long-term	0.01	Median average number of mature female halibut
Avoid very low stock sizes	$dRSB < \text{Limit of control rule}$	10 year period, long-term	0.05	$P(dRSB < \text{Limit})$
Mostly avoid low stock sizes	$dRSB < \text{Threshold of control rule}$	10 year period, long-term	0.25	$P(dRSB < \text{Threshold})$
When $\text{Limit} < \text{Estimated Biomass} < \text{Threshold}$ , limit the probability of declines	SSB declines when $20\% < RSB < 30\%$	10 year period, long-term	0.05 – 0.5, depending on est. stock status	$P(SSB_{i+1} < SSB_i)$ given $20\% < RSB < 30\%$
Spawning Biomass	An absolute measure	10 year period, long-term	NA	Median $\overline{RSB}$

<b>Fishery Sustainability, Stability, and Access</b>				
<b>Measurable Objective</b>	<b>Outcome</b>	<b>Time-frame</b>	<b>Probability</b>	<b>Performance Metrics</b>
Maintain directed fishing opportunity	Fishery is open	Each year	0.05	$P(FCEY = 0)$
Maximize yield in each regulatory area		Each year	0.5	
Maintain median catch	Within $\pm 10\%$ of 1993-2012 average	Within 5 yrs, 10 yr per, long term		$P(FCEY > 110\% \text{ or } FCEY < 90\%)$
Maintain average catch	$> 70\%$ of historical 1993-2012 average	10 year period, long-term	0.1	$P(FCEY < 70\%)$
Limit annual changes in TAC, coast-wide and/or by Regulatory Area	Change in FCEY $< 15\%$	10 year period, long-term		$P\left(\frac{FCEY_{i+1} - FCEY_i}{FCEY_i} > 15\%\right)$
Absolute	FCEY	10 year period, long-term	NA	Median $\overline{FCEY}$
Absolute	Variability in FCEY	10 year period, long term		Average Annual Variability (AAV)



<b>Minimize wastage</b>				
<b>Measurable Objective</b>	<b>Outcome</b>	<b>Time-frame</b>	<b>Probability</b>	<b>Performance Metrics</b>
Wastage in the longline fishery	<10% of annual catch limit	10 year period, Long-term	0.25	$P(\text{wastage} > 10\%FCEY)$
Absolute	Wastage	10 year period, Long-term		Median $\overline{\text{wastage}}$

<b>Minimize bycatch and bycatch mortality</b>				
<b>Measurable Objective</b>	<b>Outcome</b>	<b>Time-frame</b>	<b>Probability</b>	<b>Performance Metrics</b>

<b>Serve consumer needs</b>				
<b>Measurable Objective</b>	<b>Outcome</b>	<b>Time-frame</b>	<b>Probability</b>	<b>Performance Metrics</b>

<b>Preserve biocomplexity</b>				
<b>Measurable Objective</b>	<b>Outcome</b>	<b>Time-frame</b>	<b>Probability</b>	<b>Performance Metrics</b>



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**APPENDIX VII**

**CONSOLIDATED SET OF RECOMMENDATIONS AND REQUESTS OF THE 9<sup>TH</sup> SESSION OF THE  
IPHC MANAGEMENT STRATEGY ADVISORY BOARD (MSAB09)**

***RECOMMENDATIONS***

**NOTING** that the core purpose of the MSAB09 is to review progress on the MSE Program of Work, and to provide guidance for the delivery of products to the MSAB10 in October 2017, the MSAB **AGREED** that formal recommendations to the Commission would not be developed at the present meeting, but rather, these would be developed at the MSAB10.

***REQUESTS***

***MSAB Program of Work and delivery schedule for 2017***

MSAB09-Req.01 ([para. 15](#)) The MSAB **REQUESTED** that the MSE Program of Work and delivery schedule be expanded past the current 2018 timeframe, to provide a three-year outlook, thereby detailing the work to be completed and delivery times, noting that the Commission has directed the IPHC Secretariat to accelerate the process as follows:

AM093-Rec.07 (para. 39) “*The Commission RECOMMENDED that the IPHC Management Strategy Evaluation (MSE) process be accelerated so that more of the elements contained within the current Program of Work are delivered at the 94th Annual Meeting of the Commission in 2018. The IPHC Secretariat is directed to mobilise carryover funds from “core operations” to ensure the accelerated delivery schedule.*”

***Harvest strategy policy: Framework***

MSAB09-Req.02 ([para. 21](#)) The MSAB **REQUESTED** that the IPHC Secretariat staff move forward by using a coastwide Operating Model with five coastwide fleets, as in the coastwide assessment models. A coastwide model lacks complexity but has utility for investigating coastwide fishing intensity.

***Harvest strategy policy: Management procedures***

MSAB09-Req.03 ([para. 28](#)) The MSAB **REQUESTED** that:

- a)  $F_{SPR}$  be analysed as the primary metric of fishing intensity over a range of values, and that several other fishing intensity metrics described in paper IPHC-2017-MSAB09-07 be reported as performance metrics. [Table 2](#) describes the specific Management Procedures and values in priority order that should be evaluated.
- b) further evaluation of the harvest control rule described in paper IPHC-2017-MSAB09-07 be undertaken, with  $F_{SPR}$  as the object of the control rule’s actions, but including a nominal amount of bycatch and personal use catch (based on realistic expectations from the fishery) when  $F_{SPR}$  is set to zero by the control rule. [Table 2](#) describes the specific management procedures and values in priority order that should be evaluated.
- c) simulation sensitivities, as described in [Table 2](#), be evaluated for a selection of specific combinations of Management Procedures.



**Table 2** Management Procedures and values, in priority order, to be used by the IPHC Secretariat staff for evaluation.

Management Procedure	Values
SPR	0.25 – 0.60, higher density near 46%
Control Rule	30:20, 40:20 threshold and limit, respectively
Ceiling on Total Mortality	85 Mlbs
Floor on Total Mortality	30 Mlbs

Sensitivity	Values
Size-at-age	High and low states
Recruitment	High and low states
Maximum bycatch	At per-area maximum regulatory bycatch
Bycatch selectivity	Shifted to a greater proportion of U26 fish
Uncertainty in total mortality	Unknown

**Goals, objectives, and performance metrics**

MSAB09–Req.04 ([para. 33](#)) The MSAB **REQUESTED** that performance metrics be reported for short-, medium-, and long-term timeframes. Long-term timeframes would be at least 50 to 60 years, and other timeframes will be considered in consultation with the IPHC’s Scientific Review Board.

MSAB09–Req.05 ([para. 35](#)) The MSAB **REQUESTED** that the goals and objectives provided at [Appendix VI](#) be used for the IPHC Secretariat’s analysis to be prepared for MSAB10, **NOTING** that, although objectives for the overarching goals concerning bycatch, consumer needs, and preserving biocomplexity have not yet been identified, those goals would be addressed at least partially by other elements of the analysis.

**Deliverables for MSAB10 and for the 2018 Annual Meeting (AM094)**

MSAB09–Req.06 ([para. 47](#)) The MSAB **REQUESTED** that the following items be delivered by the IPHC Secretariat staff to the MSAB10 for further consideration, prior to their delivery to the Commission at AM094:

- a) Simulation results of Management Procedure evaluation including sensitivity analysis.
- b) Terms and Definitions for a refined Harvest Strategy Policy.
- c) Updates on the Scientific Review Board discussions/recommendations on stock distribution, biocomplexity, and performance metric timeframes.
- d) Updated MSE Program of Work (2016-20).
- e) Updates on other pertinent work.