



## Report of the 97<sup>th</sup> Session of the IPHC Interim Meeting (IM097)

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Meeting held electronically, 30 November – 1 December 2021

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## ACRONYMS

CB	Conference Board
DFO	Department of Fisheries and Ocean (Canada)
DMR	Discard Mortality Rate
FISS	Fishery-Independent Setline Survey
IPHC	International Pacific Halibut Commission
NOAA	National Oceanic and Atmospheric Administration
NPFMC	North Pacific Fishery Management Council
PFMC	Pacific Fisheries Management Council
RAB	Research Advisory Board
SB	Spawning Biomass
SRB	Scientific Review Board
TCEY	Total Constant Exploitation Yield
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** (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.
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## **EXECUTIVE SUMMARY**

The 97<sup>th</sup> Session of the International Pacific Halibut Commission (IPHC) Interim Meeting (IM097) was held electronically from 30 November to 1 December 2021. A total of 14 members (6 Commissioners; 8 advisors/experts) attended the Session from the two (2) Contracting Parties, as well as 102 observers. The meeting was opened by the Chairperson, Mr Glenn Merrill (USA), who welcomed participants.

The following are a subset of the complete recommendations and requests for action from the IM097, which are provided at [Appendix VI](#).

## **RECOMMENDATIONS**

### ***IPHC Fishery regulations: Proposals for the 2021-22 process***

IM097-Rec.01 ([para. 67](#)) The Commission **RECOMMENDED** that interested stakeholders note the deadline for submission of IPHC Fishery Regulation proposals, for consideration at the 98<sup>th</sup> Session of the Annual Meeting (AM098), of **25 December 2021**. Late proposals will not be considered at AM098, but stakeholders may also submit statements up until the day before the AM098. More information is available via the IPHC website: <https://iphc.int/the-commission/fishery-regulations/>

## **REQUESTS**

### ***IPHC Fishery-Independent Setline Survey (FISS) design and implementation in 2021***

IM097-Req.01 ([para. 24](#)) The Commission **REQUESTED** that the IPHC Secretariat develop and provide a time series representation of depredation, in particular whale depredation, and other reasons for ineffective sets, at future Interim and Annual meetings.

### ***2022-24 FISS design evaluation***

IM097-Req.02 ([para. 33](#)) The Commission **REQUESTED** further information be provided intersessionally, on how secondary and tertiary FISS objectives are incorporated into the final FISS design (using the optimized FISS 2022 option 1 design as a working example).

In addition, the Commission endorsed the following:

([para. 31](#)) The Commission **ENDORSED** optimized design 1 for the 2022 FISS, with full sampling in IPHC Regulatory Area 4CDE ([Appendix IV](#)), and optimized design 2, reduced sampling in IPHC Regulatory Area 4CDE ([Appendix V](#)), as an alternative if necessary. As with all years, the Commission will have an additional opportunity to modify the 2022 FISS design at AM098.

([para. 32](#)) The Commission provisionally **ENDORSED** the proposed designs for 2023-24, as provisionally endorsed by the Scientific Review Board at SRB018, recognizing that the 2023-24 designs are expected to be modified in subsequent years.

## 1. OPENING OF THE SESSION

1. The 97<sup>th</sup> Session of the International Pacific Halibut Commission (IPHC) Interim Meeting (IM097) was held electronically from 30 November to 1 December 2021. A total of 14 members (6 Commissioners; 8 advisors/experts) attended the Session from the two (2) Contracting Parties, as well as 102 observers. The list of participants is provided at [Appendix I](#). The meeting was opened by the Chairperson, Mr Glenn Merrill (USA), who welcomed participants.

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

2. The Commission **ADOPTED** the Agenda as provided at [Appendix II](#). The documents provided to the IM097 are listed in [Appendix III](#).

## 3. IPHC PROCESS

### 3.1 *Update on actions arising from the 97<sup>th</sup> Session of the IPHC Annual Meeting (AM097), and 2021 Special Sessions*

3. The Commission **NOTED** paper [IPHC-2021-IM097-03](#) which provided an opportunity to consider the progress made during the intersessional period in relation to the direct requests for action by the Commission during the 97<sup>th</sup> Session of the IPHC Annual Meeting (AM097, January 2021), and 2021 Special Sessions.
4. The Commission **AGREED** to consider and revise as necessary, the actions arising, and for these to be combined with any new actions arising from the IM097.

### 3.2 *Report of the IPHC Secretariat (2021): Draft*

5. The Commission **NOTED** paper [IPHC-2021-IM097-04](#) which provided the Commission with a draft update on the activities of the IPHC Secretariat in 2021, not already contained within other papers before the Commission.

### 3.3 *2<sup>nd</sup> IPHC Performance Review (PRIPHC02): Implementation of recommendations*

6. The Commission **NOTED** paper [IPHC-2021-IM097-05](#), which provided the Commission with an update on the implementation of the recommendations arising from the 2<sup>nd</sup> Performance Review of the IPHC (PRIPHC02).
7. The Commission **NOTED** that progress has not been made on:

PRIPHC02-Rec.09 [modified Commission directive]: *“The Commission RECOMMENDED that the IPHC Secretariat, in consultation with the Commission, develop minimum data collection standards for Pacific halibut by scientific observer programs. The intention would be for the Commission to review and approve the minimum standards, and recommend them for implementation by domestic agencies.”*

### 3.4 *Report of the 22<sup>nd</sup> Session of the IPHC Research Advisory Board (RAB022)*

8. The Commission **NOTED** the Report of the 22<sup>nd</sup> Session of the IPHC Research Advisory Board (RAB022) ([IPHC-2021-RAB022-R](#)) which was held on 29 November 2021.
9. The Commission **NOTED** that the proposed amendments to the RAB Terms of Reference would be considered for adoption at the 98<sup>th</sup> Session of the IPHC Annual Meeting (AM098) in January 2022.
10. The Commission **NOTED** that the following agreement from RAB022 of the proposed FISS 2022 design (optimized design 1 (1,188 stations) in comparison to the minimum science design of 1,005 stations):

(IPHC-2021-RAB022-R, para 26) *NOTING the 2022 FISS design endorsed by the SRB018, and the planned modifications to target long-term revenue neutrality, the RAB AGREED that optimized design 1, with full sampling in IPHC Regulatory Area 4CDE, appeared to be the most appropriate.”*

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### 3.5 Reports of the IPHC Scientific Review Board

11. The Commission **NOTED** the Reports of the 18<sup>th</sup> and 19<sup>th</sup> Sessions of the IPHC Scientific Review Board (SRB018: [IPHC-2021-SRB018-R](#); SRB019: [IPHC-2021-SRB019-R](#)) which were presented on behalf of the SRB.

## 4. FISHERY DATA OVERVIEW (2021): PRELIMINARY

12. The Commission **NOTED** paper [IPHC-2021-IM097-06 Rev\\_1](#) which provided an overview of the key fishery statistics from fisheries catching Pacific halibut during 2021, including the status of landings compared to fishery limits implemented by the Contracting Parties of the Commission.
13. The Commission **NOTED** the overage in IPHC Regulatory Area 2C, where 109% of the fishery limit was taken. The Commission also **NOTED** the overage in the guided recreational fishery limits in Regulatory Area 2C and 3A (142% and 126% of limit, respectively.). The USA noted that the overages in the USA guided recreational fishery were likely a result of difficulties in projecting effort under unknown pandemic conditions. The Commission **NOTED** that no recreational in season management provision/policy currently exists in IPHC Regulatory Area 2C or 3A. The Commission **NOTED** that post season management occurs to help prevent or account for these overages. The directed fishery discard mortality includes removals caused by lost gear and mortality of any discarded Pacific halibut (undersized or for regulatory compliance). The level of difference with discard mortality projections is not unusual from previous years. These preliminary values will be updated at AM098.

## 5. STOCK STATUS OF PACIFIC HALIBUT (2021) AND HARVEST DECISION TABLE (2022)

### 5.1 IPHC Fishery-Independent Setline Survey (FISS) design and implementation in 2021

14. The Commission **NOTED** paper [IPHC-2021-IM097-07](#) which provided an overview of the IPHC Fishery-Independent Setline Survey (FISS) design and implementation in 2021.
15. The Commission **RECALLED** that the annual IPHC Fishery-Independent Setline Survey (FISS) of the Pacific halibut stock was augmented from 2014-2019 with expansion stations that filled in gaps in coverage in the annual FISS. Prior to 2020, the standard grid of stations comprised 1,200 stations. Following the completion in 2019, expansion stations were added to the standard grid in all IPHC Regulatory Areas, now totalling 1,890 stations for the full FISS design ([Fig. 1](#)), within the prescribed depth range of 18 to 732 metres (10 to 400 fathoms).
16. The Commission **RECALLED** that at the [9<sup>th</sup> Special Session of the Commission](#) (SS09), the Commission recommended a FISS design for 2021 that included 1,346 stations coastwide ([Fig. 2](#)). The design comprised sampling of subareas within IPHC Regulatory Areas 2A, 4A, and 4B intended to reduce potential bias (relative to historical observed changes year-to-year) and to achieve a level of precision comparable to or better than recent setline surveys. 2021 sampling in IPHC Regulatory Areas 2B (except inside waters), and 3B included random subsampling from the full design to provide for unbiased estimates, while increasing precision relative to recent setline surveys. Sampling in IPHC Regulatory Area 4CDE included 100% of the full FISS design.

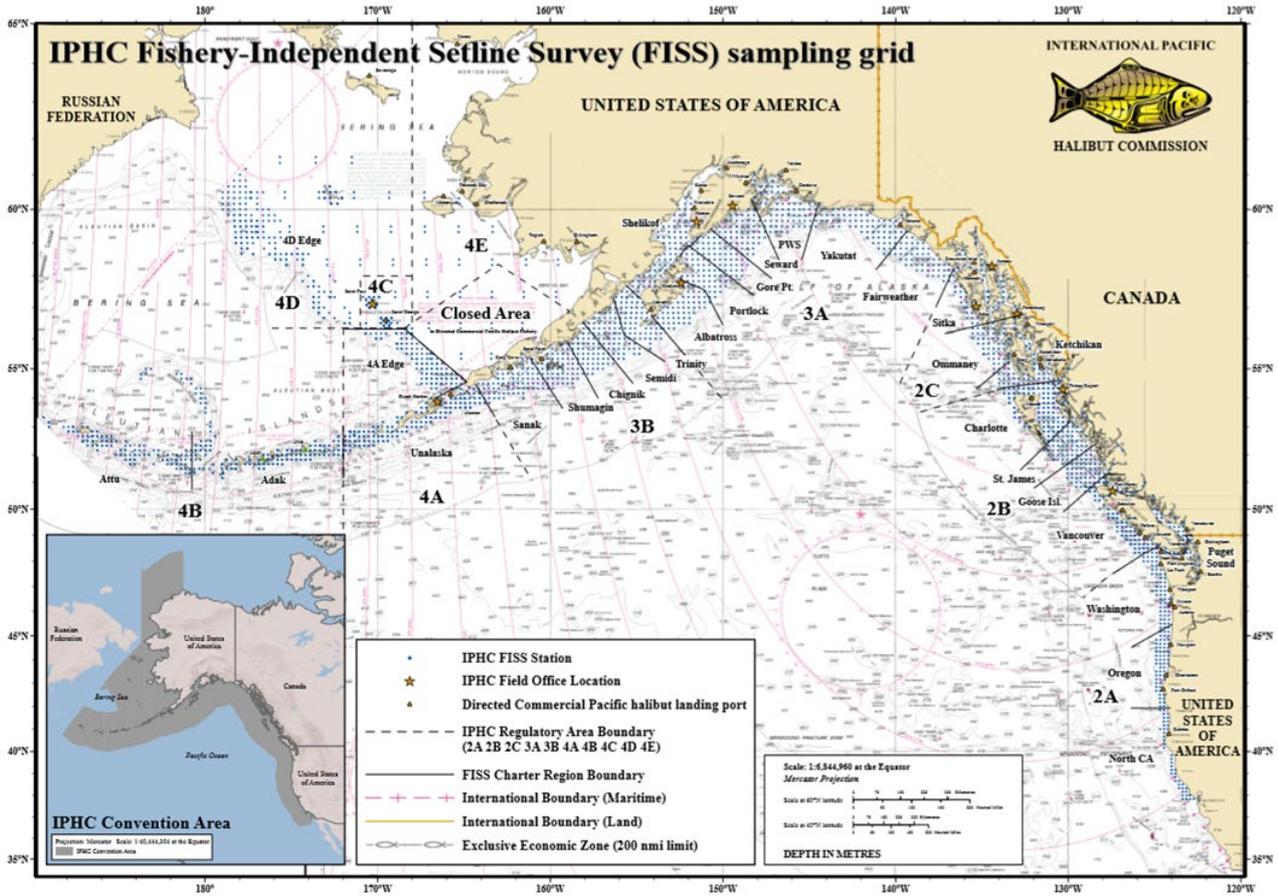


Figure 1. IPHC Fishery-Independent Setline Survey (FISS) with full sampling grid shown.

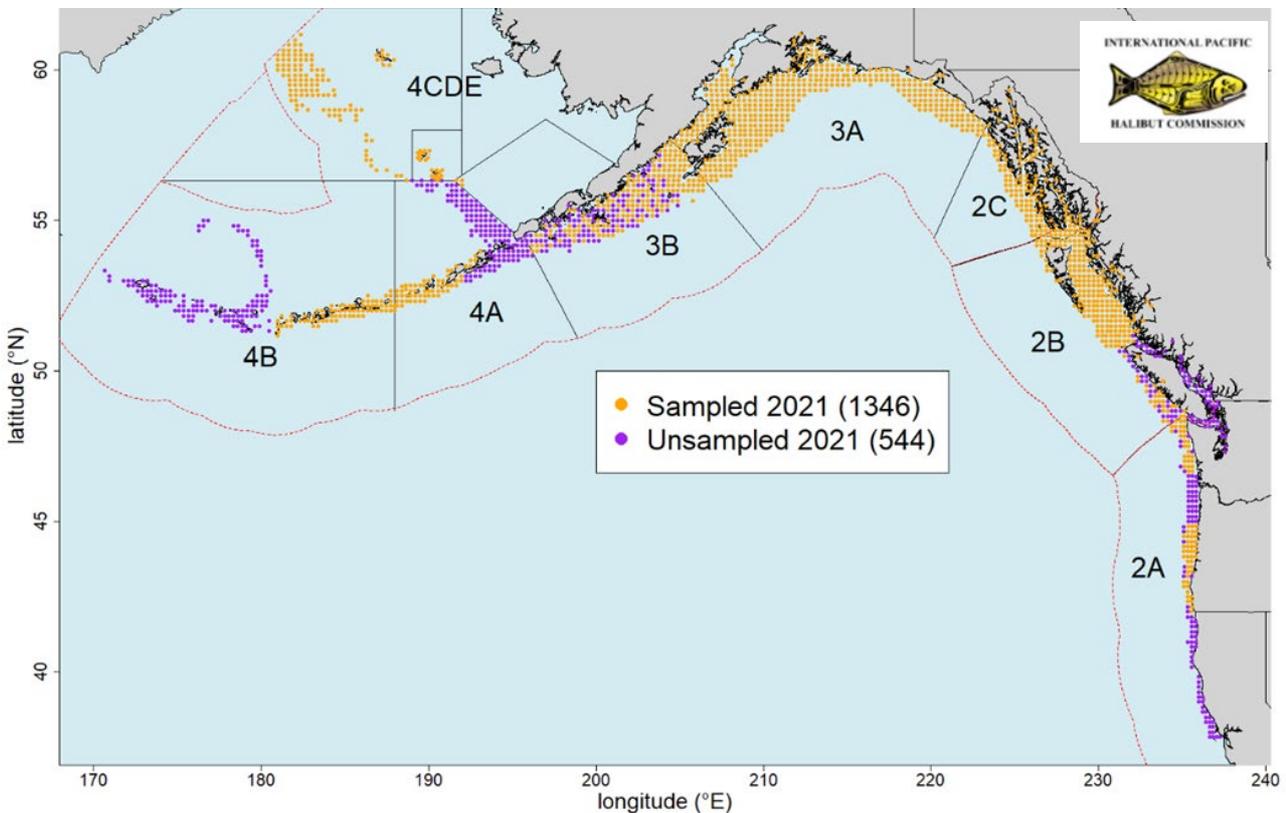


Figure 2. Map of the 2021 FISS design endorsed by the Commission on 8 December 2020 (IPHC-2020-SS09-R). Purple circles were not to be sampled in 2021.

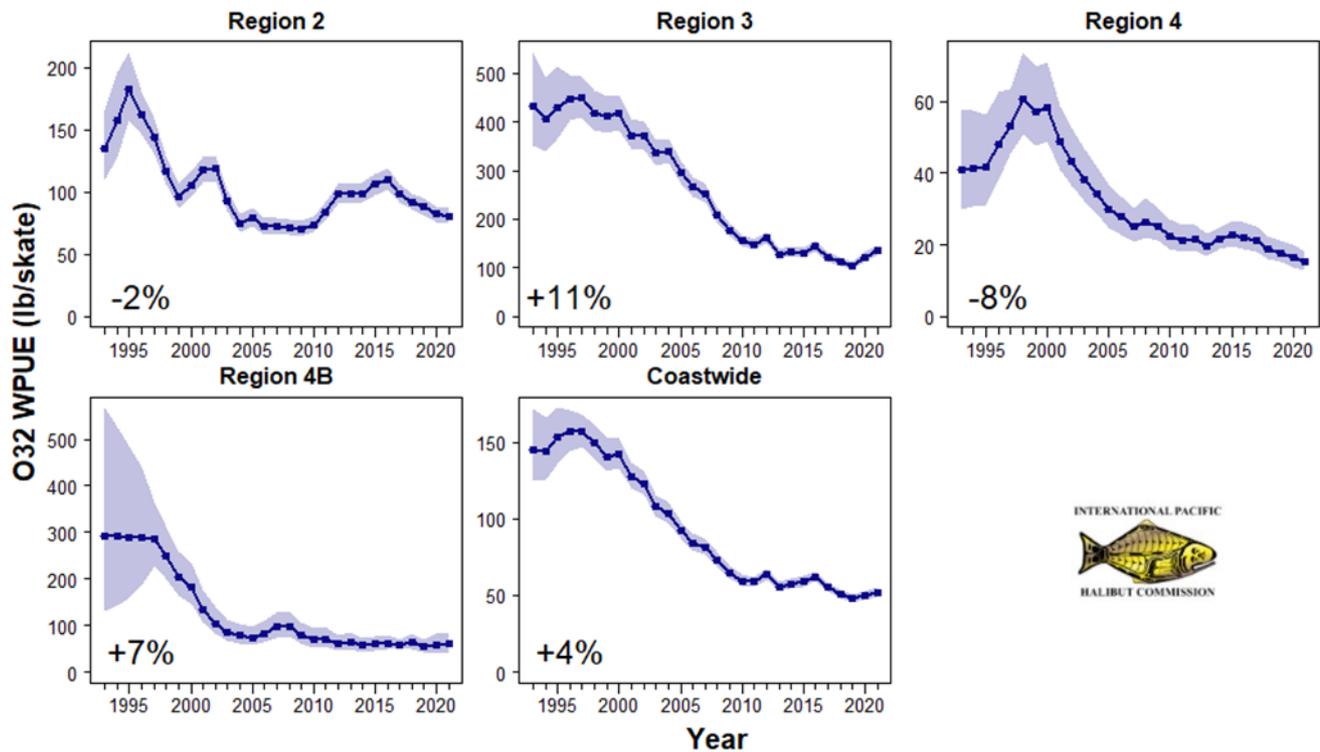
17. The Commission **NOTED** that as in previous years, all legal-sized (O32) Pacific halibut that were caught on FISS stations were retained, and sold. In addition, beginning in 2020, sub-legal (U32) Pacific halibut that were caught and randomly selected for otolith sampling were also retained and sold. This helps to

offset costs of the FISS. FISS vessels also retained for sale incidentally captured rockfish (*Sebastes* spp.) and Pacific cod (*Gadus macrocephalus*). These species were retained because they rarely survive the barotrauma resulting from capture. Most vessel contracts provided the vessel a lump sum payment, along with a 10% share of the Pacific halibut proceeds and a 50% share of the incidental catch proceeds.

18. The Commission **NOTED** that the 2021 FISS chartered 13 commercial longline vessels (four Canadian and nine USA) during a combined 82 trips and 801 charter days. Otoliths were removed from 13,258 fish coastwide. Approximately 373 tonnes (823,000 pounds) of Pacific halibut, 33 tonnes (73,600 pounds) of Pacific cod, and 40 tonnes (87,250 pounds) of rockfish were landed from the FISS stations.
19. The Commission **NOTED** that in 2021, individual Pacific halibut were again weighed at sea throughout the FISS (project commenced in 2019) in order to improve the quality of estimates based on Pacific halibut weight. The use of direct weight measurements will lead to more accurate estimates of WPUE and other quantities based on weights, allow estimation of length-weight curves based on all sizes available to longline gear (whereas collections from directed commercial landings only measure fish greater than or equal to 81.3 cm in length) and provide additional information on biases in the standard curve and spatial differences in the length-weight relationship.
20. The Commission **NOTED** that for the second year running, sub-legal (U32) Pacific halibut that were caught and randomly selected for otolith sampling were also retained and sold to offset costs of the FISS and to prevent discarding of dead fish. The average coastwide price received for U32 fish in 2021 was US\$5.66/lb (up from US\$4.16), while the average coastwide price for O32 fish was US\$6.91/lb (up from US\$4.77).
21. The Commission **NOTED** that the interactive views of the 2021 FISS results (including all prior years) were made publicly available via the IPHC website on 29 October 2021: <https://www.iphc.int/data/setline-survey-catch-per-unit-effort>.
22. The Commission **NOTED** that no sampling in Regulatory Area 4CDE occurred in 2020, and reduced sampling in 2021 occurred due to vessel mechanical issues and poor weather, relative to the endorsed design. The Commission **NOTED** that this outcome, combined with the fact that the last full survey in this area was in 2016, contributed to the rationalization for optimized design 1 for FISS 2022.
23. The Commission **CONGRATULATED** the IPHC Secretariat for delivering the 2021 FISS safely under continued very difficult circumstances, and that it was a great success, meeting both the Commission's scientific requirements and maintaining our economic goal of long-term revenue neutrality.
24. The Commission **REQUESTED** that the IPHC Secretariat develop and provide a time series representation of depredation, in particular whale depredation, and other reasons for ineffective sets, at future Interim and Annual meetings.

## 5.2 *Space-time modelling of survey data*

25. The Commission **NOTED** paper [IPHC-2021-IM097-08](#) which provided the results of the 2021 space-time modelling of Pacific halibut survey data for the period 1993-2021 (including data from several fishery-independent surveys), and modelling results from fixed- and snap-gear comparison in IPHC Regulatory Area 3A.
26. The Commission **NOTED** [Figure 3](#) which shows the time series estimates of O32 WPUE (most comparable to fishery catch-rates) over the 1993-2021 period included in the 2021 space-time modelling. Overall, there was an estimated increase of 4% in the coastwide O32 WPUE index from 2020, due largely to a 11% increase in Region 3 ([Fig. 3](#)).



**Figure 3.** Space-time model output for O32 WPUE for 1993-2021 for Biological Regions. Filled circles denote the posterior means of O32 WPUE for each year. Shaded regions show posterior 95% credible intervals, which provide a measure of uncertainty: the wider the shaded interval, the greater the uncertainty in the estimate. Numeric values in the lower left-hand corners are estimates of the change in mean O32 WPUE from 2020 to 2021.

27. The Commission **NOTED** that in Regulatory Area 3A, data from both fixed and snap gears were used in the modelling. The 2021 study provided ambiguous and inconsistent results, implying the need for a larger and more carefully designed comparison in this geographic region, one that controls as much as possible for factors such as vessel and temporal effects on catch rates of Pacific halibut, as was the case in the 2019 gear comparison study.
28. The Commission **NOTED** that vessel effects on FISS catch rates are a component of the variability in the FISS data and are not explicitly accounted for in estimation.
29. The Commission **NOTED** the unclear results of the 2021 gear comparison study, and recognized the need for a more extensive comparison.

### 5.3 2022-24 FISS design evaluation

30. The Commission **NOTED** paper [IPHC-2021-IM097-09](#) which proposed designs for the IPHC's Fishery-Independent Setline Survey (FISS) for the 2022-24 period, and an evaluation of those designs, as reviewed and endorsed by the Scientific Review Board in June 2021 (SRB018).
31. The Commission **ENDORSED** optimized design 1 for the 2022 FISS, with full sampling in IPHC Regulatory Area 4CDE ([Appendix IV](#)), and optimized design 2, reduced sampling in IPHC Regulatory Area 4CDE ([Appendix V](#)), as an alternative if necessary. As with all years, the Commission will have an additional opportunity to modify the 2022 FISS design at AM098.
32. The Commission provisionally **ENDORSED** the proposed designs for 2023-24, as provisionally endorsed by the Scientific Review Board at SRB018, recognizing that the 2023-24 designs are expected to be modified in subsequent years.
33. The Commission **REQUESTED** further information be provided intersessionally, on how secondary and tertiary FISS objectives are incorporated into the final FISS design (using the optimized FISS 2022 option 1 design as a working example).

34. The Commission **RECALLED** that the priority of a rationalised FISS sampling design is to maintain or enhance data quality (precision and bias) by establishing minimum sampling requirements in terms of station count, station distribution and skates per station. Potential considerations that could add to or modify the design are logistics and cost (secondary design layer), and FISS removals (impact on the stock), data collection assistance for Contracting Party agencies, and IPHC policies (tertiary design layer). These priorities are outlined in [Table 1](#).
35. The Commission **RECALLED** that the addition of stations beyond those required to meet minimum bias and maximum variance targets, whether for logistical or revenue/expense purposes, also provide a scientific benefit in that year and in subsequent years in the form of increased precision, reduced potential for bias and increased biological sampling.
36. The Commission **NOTED** that:
- a) the choice of numbers of skates per station is made to help ensure that the secondary objective of long-term revenue neutrality is met, and accounts for differences in cost due the relationship between number of skates and number of stations that can be fished per day;
  - b) in selecting additional stations in the optimised designs ([Appendix IV](#) and [Appendix V](#)), the IPHC Secretariat excluded stations shallower than 20 fathoms and deeper than 275 fathoms;
  - c) due to the low proportion of FISS stations that are ineffective due to whale depredation, the effect of this loss of data on the variance of estimates is minor;
  - d) a <15% target range for the coefficient of variation (CV) of WPUE and NPUE indices was chosen in order to maintain the precision of the estimated indices within historical levels. CVs are lower than 10% within IPHC Regulatory Areas 2B, 2C, 3A and 3B, but the sampling required to decrease the CV further in other IPHC Regulatory Areas would present considerable logistical challenges.

**Table 1.** Prioritization of FISS objectives and corresponding design layers.

Priority	Objective	Design Layer
Primary	Sample Pacific halibut for stock assessment and stock distribution estimation.	Minimum sampling requirements in terms of: <ul style="list-style-type: none"> <li>• Station distribution;</li> <li>• Station count;</li> <li>• Skates per station.</li> </ul>
Secondary	Long-term revenue neutrality.	Logistics and cost: operational feasibility and cost/revenue neutrality.
Tertiary	Minimize removals, and assist others where feasible on a cost-recovery basis.	Removals: minimize impact on the stock while meeting primary priority; Assist: assist others to collect data on a cost-recovery basis; IPHC policies: ad-hoc decisions of the Commission regarding the FISS design.

***FISS cost, revenue, and tender considerations***

***Cost and revenue***

37. The Commission **RECALLED** that FISS design projections for 2022 are based on a 5% decline in catch rates and a 2.5% decline in price relative to 2021.
38. The Commission **NOTED** the support from both the IPHC Secretariat, SRB and the RAB, for increased sampling in IPHC Regulatory Area 4CDE, reflecting the increasingly dynamic nature of this area, its critical location near the boundary of Convention waters with Russia, and the greater uncertainty associated with no sampling in Regulatory Area 4CDE in 2020, and reduced sampling in 2021 relative to the planned design.
39. The Commission **NOTED** the projections of FISS cost and revenue for the proposed 2022 design of 1,005 stations ([IPHC-2021-IM097-09](#)).

40. The Commission **NOTED** that the net revenue positive 2021 FISS allows for ~\$200k to supplement the 2022 design.
41. The Commission **NOTED** the two optimized designs provided by the IPHC Secretariat, which include adding additional skates and stations in order to meet secondary objectives; design #1 included sampling of 100% of IPHC Regulatory Area 4CDE, and design #2 including reduced sampling of 4CDE stations (38%; focused on southern stations not sampled in 2021).
42. The Commission **NOTED** that the estimated revenue figures should be considered with a +/- of ~\$500,000 given stock abundance and price uncertainty.

#### ***2022 FISS bid specifications and tenders***

43. The Commission **NOTED** that the IPHC Secretariat will be soliciting tenders for the 2022 FISS in December 2021 (with tenders due on 31 January 2022), and that the tender specifications would incorporate the standard wording around amendments that the Commission may make at any time prior to the FISS season commencing. The tender process follows standard U.S. General Services Administration (GSA) guidelines, and is available on the IPHC website for transparency and accountability purposes.

#### ***5.4 Data overview and preliminary stock assessment (2021), and draft harvest decision table (2022)***

44. The Commission **NOTED** paper [IPHC-2021-IM097-10 Rev 1](#) which provided an opportunity to consider the results of the 2021 IPHC stock assessment for Pacific halibut within the Convention Area, including a summary of data sources used, as well as stock projections and the draft harvest decision table for 2022.
45. The Commission **NOTED** that:
- the 2021 stock assessment represented an update of the 2019 and 2020 analyses, and produced results that were consistent with recent stock assessments;
  - estimated fishing mortality in 2020 and 2021 has been lower than projected;
  - the recent spawning biomass trend, declining since 2016, has been a result of low recruitment over the period 2006-2011, but that 2021 data reflect a stronger 2012 cohort, observed in both the FISS and directed commercial fishery, and slowing the rate of decline in spawning biomass;
  - modelled FISS trends indicated an increase in both numbers per unit effort (17%) and weight per unit effort of all sizes captured by the survey (13%). Increases in O32 weight per unit effort from 2020 to 2021, were observed in IPHC Regulatory Area 3B (57%, 2B (11%, and 4B (7%), and decreases were observed in Area 2C (12%), 4CDE (9%), 4A (6%), 3A (4%), and 2A (1%);
  - coastwide, and in most IPHC Regulatory Areas, commercial logbook records indicated similar patterns in recent years;
  - stock distribution has shifted over 2020-2021 toward a higher proportion of the coastwide stock occurring in Biological Region 3, with concurrent decreases in Biological Regions 2 and 4.
46. The Commission **NOTED** that the reference level of fishing intensity (F43%; adopted in 2020) is estimated to result in a coastwide TCEY of 41.2 million pounds for 2022, slightly above the status quo coastwide TCEY set for 2021 (39.0 million pounds), and also above the TCEY estimated to correspond to the three-year projected surplus production (38.0 million pounds) projected to stabilize the stock at the current spawning biomass.
47. The Commission **NOTED** that the preliminary detailed mortality projections for 2022 will be updated in January 2022, and included in a revised mortality projection tool for use during AM098.
48. The Commission **RECALLED** that the annual TCEY decision making process incorporates not only the outputs from the annual stock assessment process, but can also include stability principles such as minimizing changes in TCEY from one year to the next.

## 6. IPHC SCIENCE AND RESEARCH

### 6.1 *IPHC 5-year Biological & Ecosystem Science Research Plan (2017-21): update*

49. The Commission **NOTED** paper [IPHC-2021-IM097-11](#) which provided a description of progress on the IPHC's Biological and Ecosystem Science Research Plan.
50. The Commission **NOTED** the primary biological research activities at the IPHC that follow Commission objectives are identified and described in the IPHC 5-Year Biological and Ecosystem Science Research Plan (2017-21) ([IPHC-2019-BESRP-5YP](#)). These activities are summarized in five broad research areas designed to provide inputs into stock assessment and the management strategy evaluation processes, as follows:
- 1) **Migration.** Studies are aimed at further understanding reproductive migration and identification of spawning times and locations as well as larval and juvenile dispersal.
  - 2) **Reproduction.** Studies are aimed at providing information on the sex ratio of the commercial catch and to improve current estimates of maturity.
  - 3) **Growth and Physiological Condition.** Studies are aimed at describing the role of some of the factors responsible for the observed changes in size-at-age and to provide tools for measuring growth and physiological condition in Pacific halibut.
  - 4) **Discard Mortality Rates (DMRs) and Survival.** Studies are aimed at providing updated estimates of DMRs in both the longline and the trawl fisheries.
  - 5) **Genetics and Genomics.** Studies are aimed at describing the genetic structure of the Pacific halibut population and at providing the means to investigate rapid adaptive changes in response to fishery-dependent and fishery-independent influences.
51. The Commission **NOTED** the progress that the IPHC Secretariat has made in the five key research areas contemplated in the IPHC 5-Year Biological and Ecosystem Science Research Plan (2017-21) and, in particular, the promising use of genomic approaches to address important questions from stock structure and distribution to the genetic basis of key life-history traits.

### 6.2 *International Pacific Halibut Commission 5-Year program of integrated research and monitoring (2022-26)*

52. The Commission **NOTED** paper [IPHC-2021-IM097-12](#) which provided the current draft of the IPHC 5-Year program of integrated research and monitoring (2022-26), which remains in development.

## 7. MANAGEMENT STRATEGY EVALUATION

### 7.1 *IPHC Management Strategy Evaluation: update*

53. The Commission **NOTED** paper [IPHC-2021-IM097-13](#) which provided an update of progress on the Management Strategy Evaluation (MSE) program of work for 2021–2023, including progress on modelling the distribution of recruitment and its effects on estimated movement, simulating implementation uncertainty, methods to investigate size limits, and multi-year assessments.
54. The Commission **NOTED** that:
- a) implementation uncertainty will be incorporated to evaluate the robustness of MPs to plausible departures from the MP determined TCEY;
  - b) a simplified approach for investigating size limits will be used within the MSE framework;
  - c) elements of management procedures related to multi-year assessments may include holding the TCEY constant, incorporating empirical approaches in non-assessment years, and using an MP without a stock assessment;
  - d) the proposed 2022 schedule for the MSAB consisting of a meeting in May and a meeting in October 2022. The final dates will be presented for decision at AM098 in January 2022.

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## 7.2 *Ad-Hoc meeting of the MSAB*

55. The Commission **NOTED** that the MSAB met on 10 November 2021 for an ad-hoc briefing on the MSE process over the course of 2021, and planned activities for 2022.

## 8. CONTRACTING PARTY NATIONAL REPORTS

56. The Commission **RECALLED** that the provision of Contracting Party National Reports is not a formal requirement for the Interim Meeting, but rather, that National Reports are provided 30 days prior to the Annual Meeting.

### 8.1 *Canada*

57. The Commission **NOTED** that no national report was provided by Canada for consideration at the IM097.

#### 8.1.1 *Fisheries and Oceans Canada (DFO)*

58. The Commission **NOTED** that no update on Pacific halibut matters was received from Fisheries and Oceans Canada for consideration at the IM097.

### 8.2 *United States of America*

59. The Commission **NOTED** that no national report was provided by the United States of America for consideration at the IM097.

#### 8.2.1 *National Oceanic and Atmospheric Administration (NOAA) – Fisheries*

##### a) *National Marine Fisheries Service (NOAA-Fisheries)*

60. The Commission **NOTED** that no update on Pacific halibut matters was received from NOAA-Fisheries for consideration at the IM097.

##### b) *North Pacific Fishery Management Council (NPFMC)*

61. The Commission **NOTED** that no update on Pacific halibut matters was received from the NPFMC at IM097.

##### c) *Pacific Fishery Management Council (PFMC)*

62. The Commission **NOTED** that no update on Pacific halibut matters was received from the PFMC at IM097.

## 9. PACIFIC HALIBUT FISHERY ECONOMICS UPDATE

63. The Commission **NOTED** paper [IPHC-2021-IM097-14 Rev 1](#), which provided the Commission with an update on the development of the Pacific Halibut Multiregional Economic Impact Assessment (PHMEIA) model.

64. The Commission **CONSIDERED** how economic impact estimates can expand the scope of stock assessments to support harvest policies that are more holistic in nature and bring the human dimension to the management framework.

## 10. IPHC FISHERY REGULATIONS: PROPOSALS FOR THE 2021-22 PROCESS

65. The Commission **NOTED** paper [IPHC-2021-IM097-15](#), which provided the Commission with an initial indication of the IPHC Fishery Regulation proposals, which the IPHC Secretariat, Contracting Parties, and other stakeholders have indicated they anticipate submitting, for consideration by the Commission in the 2021-22 regulatory process.

66. The Commission **RECALLED** the IPHC Fishery Regulation proposal submission and review process instituted in 2017, whereby a preliminary indication of the fishery regulation proposals being submitted by the IPHC Secretariat to the Commission are provided at the Interim Meeting.

67. The Commission **RECOMMENDED** that interested stakeholders note the deadline for submission of IPHC Fishery Regulation proposals, for consideration at the 98<sup>th</sup> Session of the Annual Meeting (AM098), of **25 December 2021**. Late proposals will not be considered at AM098, but stakeholders may also submit statements up until the day before the AM098. More information is available via the IPHC website: <https://iphc.int/the-commission/fishery-regulations/>
68. The Commission **NOTED** that the IPHC Secretariat and the relevant Contracting Party agencies intend to coordinate a joint review of regulatory proposals, with the aim of identifying and resolving issues and clarifying draft regulatory language in advance of AM098.
69. The Commission **NOTED** that the Contracting Parties are interested in sharing experiences on the use of electronic logbooks in recreational fisheries.

### **10.1 IPHC Secretariat fishery regulation proposals**

#### **10.1.1 IPHC Fishery Regulations: Mortality and Fishery Limits (Sect. 5)**

70. The Commission **NOTED** paper [IPHC-2021-IM097-PropA1](#), which aimed to improve clarity and transparency of mortality and fishery limits within the IPHC Fishery Regulations (Sect. 5 of the IPHC Fishery Regulations).

#### **10.1.2 IPHC Fishery Regulations: Commercial Fishing Periods (Sect. 9)**

71. The Commission **NOTED** paper [IPHC-2021-IM097-PropA2](#), which proposed fishing periods for the directed commercial Pacific halibut fisheries within the IPHC Fishery Regulations (Sect. 9 of the IPHC Fishery Regulations).

#### **10.1.3 IPHC Fishery Regulations: minor amendments**

72. The Commission **NOTED** paper [IPHC-2021-IM097-PropA3](#), which proposed amendments to ensure clarity and consistency in the IPHC Fishery Regulations.

### **10.2 Contracting Party fishery regulation proposals**

73. The Commission **NOTED** paper IPHC-2021-IM097-PropB1, which proposed establishing improved recordkeeping requirements needed to enforce Pacific halibut annual limits for recreational (sport) fishing for Pacific halibut in IPHC Convention waters in and off Alaska.
74. The Commission **NOTED** the indication from the USA that two additional regulatory proposals are expected to be submitted for consideration at AM098 to establish the Charter Management Measures in IPHC Regulatory Areas 2C and 3A (Sect. 29) and to establish the Commercial Fishing Periods for the non-tribal fishery in IPHC Regulatory Area 2A, which may be incorporated as part of IPHC Fishery Regulations for Commercial Fishing Periods (see [paragraph 71](#)).

### **10.3 Stakeholder fishery regulation proposals**

75. The Commission **NOTED** that no Stakeholder regulatory proposals were received for consideration at the IM097.

### **10.4 Stakeholder statements**

76. The Commission **NOTED** paper IPHC-2021-IM097-INF01, which provided the Commission with a consolidated document containing ‘Statements’ from stakeholders submitted to the Commission for its consideration at the 97<sup>th</sup> Session of the IPHC Interim Meeting (IM097).

## **11. FINANCE AND ADMINISTRATION**

### **11.1 IPHC Rules of Procedure (2022): Draft**

77. The Commission **NOTED** paper [IPHC-2021-IM097-16](#), which proposed amendments to the IPHC Rules of Procedure (2021). The proposed revisions incorporate process and functional amendments intended to further modernise the IPHC’s governance procedures for some of its subsidiary bodies.

### **11.2 FY2021 Independent auditing process**

78. The Commission **NOTED** paper [IPHC-2021-IM097-17](#), which provided the Commission with the process for completion of the Independent External Auditors Report for FY2021, as per Regulation 14 of the IPHC Financial Regulations (2021).

### **11.3 FY2022 Budget update**

79. The Commission **NOTED** paper [IPHC-2021-IM097-18](#), which provided the Commission with an update on the FY2022 budget (financial period: 1 October 2021 to 30 September 2022), including potential modifications based on the 2022 FISS sampling design.

80. The Commission **NOTED** the intention of the IPHC Secretariat to propose a revised FY2022 budget (financial period: 1 October 2021 to 30 September 2022) at the FAC098 to accommodate the final 2022 FISS design to be implemented, noting that there will be no change in the Contracting Party contributions due for FY2022.

81. Recalling IPHC-2020-IM096-R 13.3 para 111, the Commission **NOTED** continued interest from USA commissioners in conducting further discussions regarding rebalancing the Party contributions in support of the annual IPHC budget.

## **12. OTHER BUSINESS**

### **12.1 Preparation for 98<sup>th</sup> Session of the IPHC Annual Meeting (AM098) and associated subsidiary bodies**

82. The Commission **NOTED** that the 98<sup>th</sup> Session of the IPHC Annual Meeting (AM098) may be held in a hybrid format with both in-person and electronic participation potentially being accommodated. The meeting is currently scheduled to be held from the 24-28 January 2022, at the Hyatt Regency Bellevue, in Bellevue, WA, USA., noting the Commission's previous direction to proceed with planning for an in-person session.

83. The Commission **AGREED** to make a final decision on meeting format before 15 December 2021, to allow for adequate planning by the Secretariat, Contracting Parties, and stakeholders.

84. The Commission **NOTED** that information concerning the meeting, including electronic versions of documents to be considered, will be published on the meeting webpages as they become available, but no later than 30 days prior to the commencement of each meeting, in accordance with Rule 8.4 of the IPHC Rules of Procedure (2021), as follows:

- 98<sup>th</sup> Session of the IPHC Finance and Administration Committee (FAC098): Deadline 25 December 2021;
- 98<sup>th</sup> Session of the IPHC Annual Meeting (AM098): Deadline 25 December 2021;
- 92<sup>nd</sup> Session of the IPHC Conference Board (CB092): Deadline 26 December 2021;
- 27<sup>th</sup> Session of the IPHC Processor Advisory Board (PAB027): Deadline 26 December 2021.

## **13. REVIEW OF THE DRAFT AND ADOPTION OF THE REPORT OF THE 97<sup>TH</sup> SESSION OF THE IPHC INTERIM MEETING (IM097)**

85. The report of the 97<sup>th</sup> Session of the IPHC Interim Meeting ([IPHC-2021-IM097-R](#)) was **ADOPTED** via correspondence on 8 December 2021, including the consolidated set of recommendations and requests arising from IM09, provided at [Appendix VI](#).

## APPENDIX I

LIST OF PARTICIPANTS FOR THE 97<sup>TH</sup> SESSION OF THE IPHC INTERIM MEETING (IM097)

## Commission Officer

Vice-Chairperson	Chairperson
Mr Paul <b>Ryall</b> (Canada)	Mr Glenn <b>Merrill</b> (United States of America)

## Commissioners

Canada	United States of America
Mr Paul <b>Ryall</b>	Mr Glenn <b>Merrill</b>
Mr Neil <b>Davis</b>	Mr Robert <b>Alverson</b>
Mr Peter <b>DeGreef</b>	Mr Richard <b>Yamada</b>

## Advisors/experts

	Mr. Doug <b>Duncan</b> – Technical Advisor
	Mr. Kurt <b>Iverson</b> – Technical
	Mr. Frank <b>Lockhart</b> – Technical/Policy Advisor
	Dr. Carey <b>McGilliard</b> – Scientific Advisor
	Ms. Alicia M. <b>Miller</b> – Technical Advisor
	Mr. David <b>Moore</b> – Financial Advisor
	Mr. Demian <b>Schane</b> – Legal Advisor
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## APPENDIX II

AGENDA FOR THE 97<sup>TH</sup> SESSION OF THE IPHC INTERIM MEETING (IM097)

**Date:** 30 November – 1 December 2021

**Location:** Electronic

**Venue:** Adobe Connect

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

**Chairperson:** Mr Glenn Merrill (USA)

**Vice-Chairperson:** Mr Paul Ryall (Canada)

1. **OPENING OF THE SESSION** (Chairperson)
2. **ADOPTION OF THE AGENDA AND ARRANGEMENTS FOR THE SESSION** (Chairperson)
3. **IPHC PROCESS (D. Wilson)**
  - 3.1 Update on actions arising from the 97<sup>th</sup> Session of the IPHC Annual Meeting (AM097), and 2021 Special Sessions (D. Wilson)
  - 3.2 Report of the IPHC Secretariat (2021): Draft (D. Wilson)
  - 3.3 2<sup>nd</sup> IPHC Performance Review (PRIPHC02): Implementation of recommendations (D. Wilson)
  - 3.4 Report of the 22<sup>nd</sup> Session of the IPHC Research Advisory Board (RAB022) (D. Wilson)
  - 3.5 Reports of the IPHC Scientific Review Board (SRB Chairperson)
4. **FISHERY DATA OVERVIEW (2021): Preliminary** (L. Erikson, H. Tran, T. Kong, & C. Prem)
5. **STOCK STATUS OF PACIFIC HALIBUT (2021) AND HARVEST DECISION TABLE 2022**
  - 5.1 IPHC Fishery-Independent Setline Survey (FISS) design and implementation in 2021 (K. Ualesi, D. Wilson, C. Jones, & R. Rillera)
  - 5.2 Space-time modelling of survey data (R. Webster)
  - 5.3 2022-24 FISS design evaluation (R. Webster)
  - 5.4 Data overview and preliminary stock assessment (2021), and draft harvest decision table (2022) (I. Stewart, A. Hicks, R. Webster, D. Wilson, & B. Hutniczak)
6. **IPHC SCIENCE AND RESEARCH**
  - 6.1 IPHC 5-year Biological and Ecosystem Science Research Plan (2017-21): update (J. Planas)
  - 6.2 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)
7. **MANAGEMENT STRATEGY EVALUATION**
  - 7.1 IPHC Management Strategy Evaluation: update (A. Hicks)
8. **CONTRACTING PARTY NATIONAL REPORTS** (Contracting Parties)
  - 8.1 Canada
    - 8.1.1 Fisheries and Oceans Canada (DFO)
  - 8.2 United States of America
    - 8.2.1 National Oceanic and Atmospheric Administration (NOAA) – Fisheries
      - 8.2.1.1 National Marine Fisheries Service (NOAA-Fisheries)
      - 8.2.1.2 North Pacific Fishery Management Council (NPFMC)
      - 8.2.1.3 Pacific Fishery Management Council (PFMC)
9. **PACIFIC HALIBUT FISHERY ECONOMICS UPDATE** (B. Hutniczak)
10. **IPHC FISHERY REGULATIONS: PROPOSALS FOR THE 2021-22 PROCESS** (B. Hutniczak & D. Wilson)

- 10.1 IPHC Secretariat fishery regulation proposals (B. Hutniczak)
- 10.2 Contracting Party fishery regulation proposals (Contracting Parties)
- 10.3 Stakeholder fishery regulation proposals (Stakeholders)
- 10.4 Stakeholder statements (Stakeholders)

**11. FINANCE AND ADMINISTRATION**

- 11.1 IPHC Rules of Procedure (2022): Draft (D. Wilson)
- 11.2 FY2021 Independent auditing process (D. Wilson)
- 11.3 FY2022 Budget update (D. Wilson)

**12. OTHER BUSINESS**

- 12.1 Preparation for the 98<sup>th</sup> Session of the IPHC Annual Meeting (AM098) and associated subsidiary bodies (D. Wilson)

**13. REVIEW OF THE DRAFT AND ADOPTION OF THE REPORT OF THE 97<sup>th</sup> SESSION OF THE IPHC INTERIM MEETING (IM097) (Chairperson & Executive Director)**

## APPENDIX III

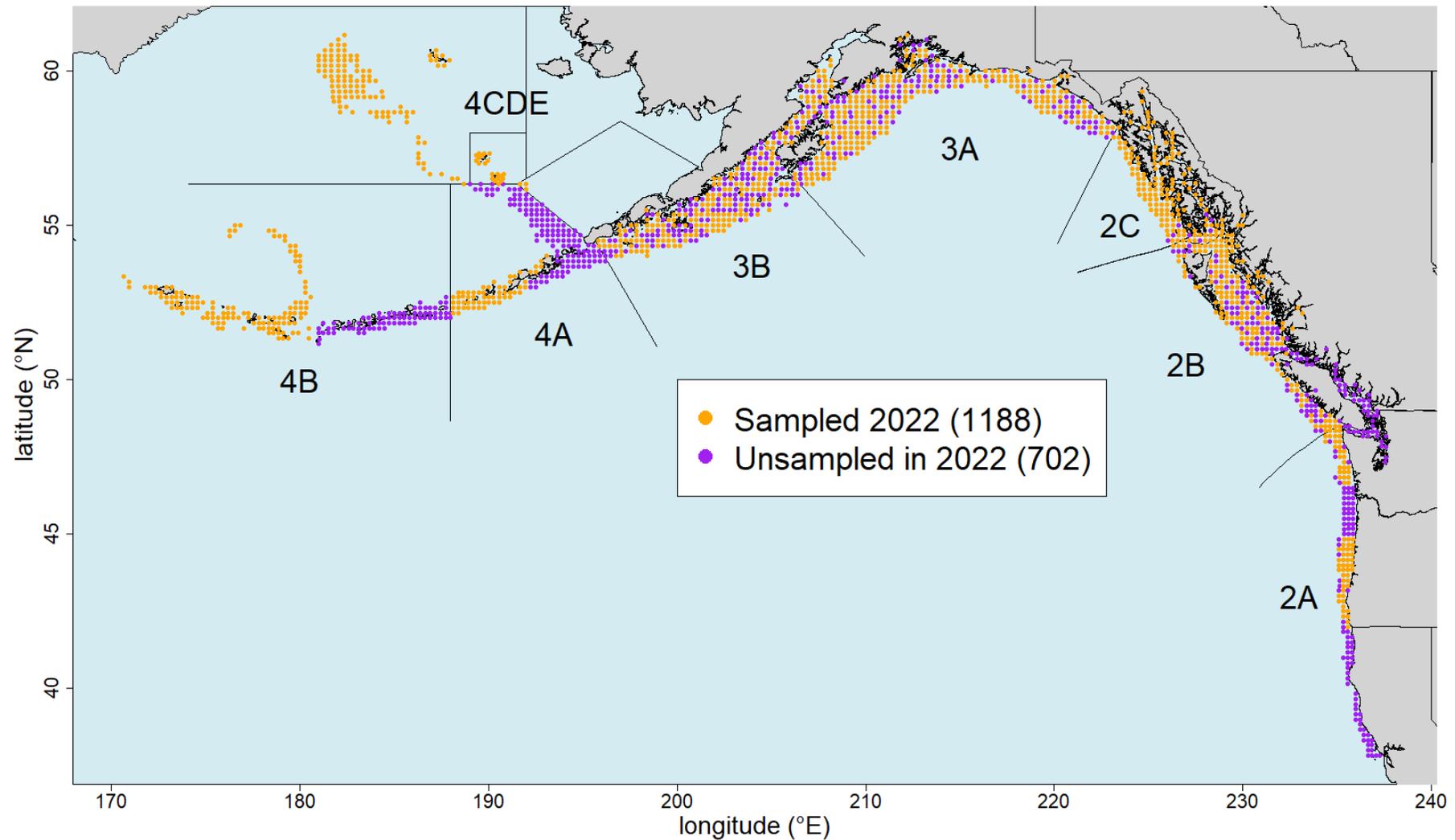
LIST OF DOCUMENTS FOR THE 97<sup>TH</sup> SESSION OF THE IPHC INTERIM MEETING (IM097)

Document	Title	Availability
IPHC-2021-IM097-01	Agenda & Schedule for the 97 <sup>th</sup> Session of the IPHC Interim Meeting (IM097)	✓ 1 Sept 2021 ✓ 12 Oct 2021 ✓ 25 Oct 2021
IPHC-2021-IM097-02	List of Documents for the 97 <sup>th</sup> Session of the IPHC Interim Meeting (IM097)	✓ 12 Oct 2021 ✓ 29 Oct 2021 ✓ 29 Nov 2021
IPHC-2021-IM097-03	Update on actions arising from the 97 <sup>th</sup> Session of the IPHC Annual Meeting (AM097), and 2021 Special Sessions (D. Wilson)	✓ 25 Oct 2021
IPHC-2021-IM097-04	Report of the IPHC Secretariat (2021): Draft (D. Wilson)	✓ 25 Oct 2021
IPHC-2021-IM097-05	Implementation of the Recommendations from the 2 <sup>nd</sup> IPHC Performance Review (PRIPHC02) (D. Wilson)	✓ 25 Oct 2021
IPHC-2021-IM097-06	Fishery data overview (2021): Preliminary (L. Erikson, H. Tran, T. Kong & C. Prem)	✓ 29 Oct 2021
IPHC-2021-IM097-07	IPHC Fishery-independent setline survey (FISS) design and implementation in 2021 (K. Ualesi, D. Wilson, C. Jones & R. Rillera)	✓ 28 Oct 2021
IPHC-2021-IM097-08 Rev_1	Space-time modelling of survey data (R. Webster)	✓ 28 Oct 2021 ✓ 12 Nov 2021
IPHC-2021-IM097-09	2022-24 FISS Design evaluation (R. Webster)	✓ 29 Oct 2021
IPHC-2021-IM097-10 Rev_1	Summary of the data, stock assessment, and harvest decision table for Pacific halibut ( <i>Hippoglossus stenolepis</i> ) at the end of 2021 (I. Stewart, A. Hicks, R. Webster, D. Wilson, & B. Hutniczak)	✓ 13 Oct 2021 ✓ 23 Nov 2021
IPHC-2021-IM097-11	IPHC 5-year Biological and Ecosystem Science Research Plan (2017-21): Update (J. Planas)	✓ 13 Oct 2021
IPHC-2021-IM097-12	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)	✓ 29 Oct 2021
IPHC-2021-IM097-13	Update on the IPHC Secretariat MSE Program of Work (2021-23) (A. Hicks & I. Stewart)	✓ 22 Oct 2021
IPHC-2021-IM097-14 Rev_1	Pacific Halibut Multiregional Economic Impact Assessment (PHMEIA): summary of progress (B. Hutniczak)	✓ 29 Oct 2021 ✓ 19 Nov 2021
IPHC-2021-IM097-15	IPHC Fishery Regulations: Proposals for the 2021-22 process (B. Hutniczak & D. Wilson)	✓ 29 Oct 2021
IPHC-2021-IM097-16	Draft: IPHC Rules of Procedure (2022) (D. Wilson & L. Erikson)	✓ 28 Oct 2021
IPHC-2021-IM097-17	FY2021 Independent auditing process (D. Wilson)	✓ 25 Oct 2021
IPHC-2021-IM097-18	FY2022 Budget - update (D. Wilson)	✓ 28 Oct 2021
<b>Contracting Party updates</b>		
IPHC-2021-IM097-NR01	<b>Canada:</b> Fisheries and Oceans Canada (DFO)	Deferred to AM098

IPHC-2021-IM097-NR02	<b>United States of America:</b> NOAA – National Marine Fisheries Service (NMFS); North Pacific Fishery Management Council (NPFMC); Pacific Fishery Management Council (PFMC)	Deferred to AM098
<b><i>IPHC Fishery Regulation proposals for 2022</i></b>		
<b><i>IPHC Secretariat Fishery Regulation proposals for 2022</i></b>		
IPHC-2021-IM097-PropA1	Mortality and Fishery Limits (Sect. 5) (IPHC Secretariat)	✓ 12 Oct 2021
IPHC-2021-IM097-PropA2	Commercial Fishing Periods (Sect. 9) (IPHC Secretariat)	✓ 12 Oct 2021
IPHC-2021-IM097-PropA3	IPHC Fishery Regulations: minor amendments (IPHC Secretariat)	✓ 22 Oct 2021
<b><i>Contracting Party Fishery Regulation proposals for 2022</i></b>		
IPHC-2021-IM097-PropB1	Recreational (sport) fishing for Pacific halibut—IPHC Regulatory Areas 2c, 3a, 3b, 4a, 4b, 4c, 4d, 4e (Sect. 29) - <i>Recordkeeping for charter Pacific halibut annual limits</i> (USA: NOAA-Fisheries)	✓ 29 Oct 2021
IPHC-2021-IM097-PropB2	Recreational (sport) fishing for Pacific halibut—IPHC Regulatory Areas 2c, 3a, 3b, 4a, 4b, 4c, 4d, 4e (Sect. 29) - <i>Charter Management Measures in IPHC Regulatory Areas 2C and 3A</i> (USA: NOAA-Fisheries)	Deferred to AM098
<b><i>Other Stakeholder Fishery Regulation proposals for 2022</i></b>		
IPHC-2021-IM097-PropC1	-	-
<b><i>Reports from IPHC subsidiary bodies</i></b>		
IPHC-2021-RAB022-R	Report of the 22 <sup>nd</sup> Session of the IPHC Research Advisory Board (RAB022)	✓ 29 Nov 2021
IPHC-2021-SRB018-R	Report of the 18 <sup>th</sup> Session of the IPHC Scientific Review Board (SRB018)	✓ 17 Jun 2021
IPHC-2021-SRB019-R	Report of the 19 <sup>th</sup> Session of the IPHC Scientific Review Board (SRB019)	✓ 23 Sept 2021
IPHC-2021-FAC097-R	Report of the 97 <sup>th</sup> Session of the IPHC Finance and Administration Committee (FAC097)	✓ 28 Jan 2021
IPHC-2021-PAB026-R	Report of the 26 <sup>th</sup> Session of the IPHC Processor Advisory Board (PAB026)	✓ 28 Jan 2021
IPHC-2021-CB091-R	Report of the 91 <sup>st</sup> Session of the IPHC Conference Board (CB091)	✓ 28 Jan 2021
<b><i>Information papers</i></b>		
IPHC-2021-IM097-INF01	Stakeholder Statements on IPHC Fishery Regulation proposals (B. Hutniczak)	✓ 29 Oct 2021
IPHC-2021-IM097-INF02	The IPHC mortality projection tool for 2022 mortality limits (I. Stewart)	✓ 12 Oct 2021
IPHC-2021-IM097-INF03	Bio-socioeconomic conditions index for Pacific halibut fisheries (B. Hutniczak)	✓ 29 Oct 2021
IPHC-2021-IM097-INF04	Pacific halibut market profile (B. Hutniczak)	✓ 29 Oct 2021
IPHC-2021-IM097-INF05	A description of the IPHC fishery-independent setline survey (FISS) abundance-based management (ABM) index (IPHC Secretariat)	✓ 29 Nov 2021

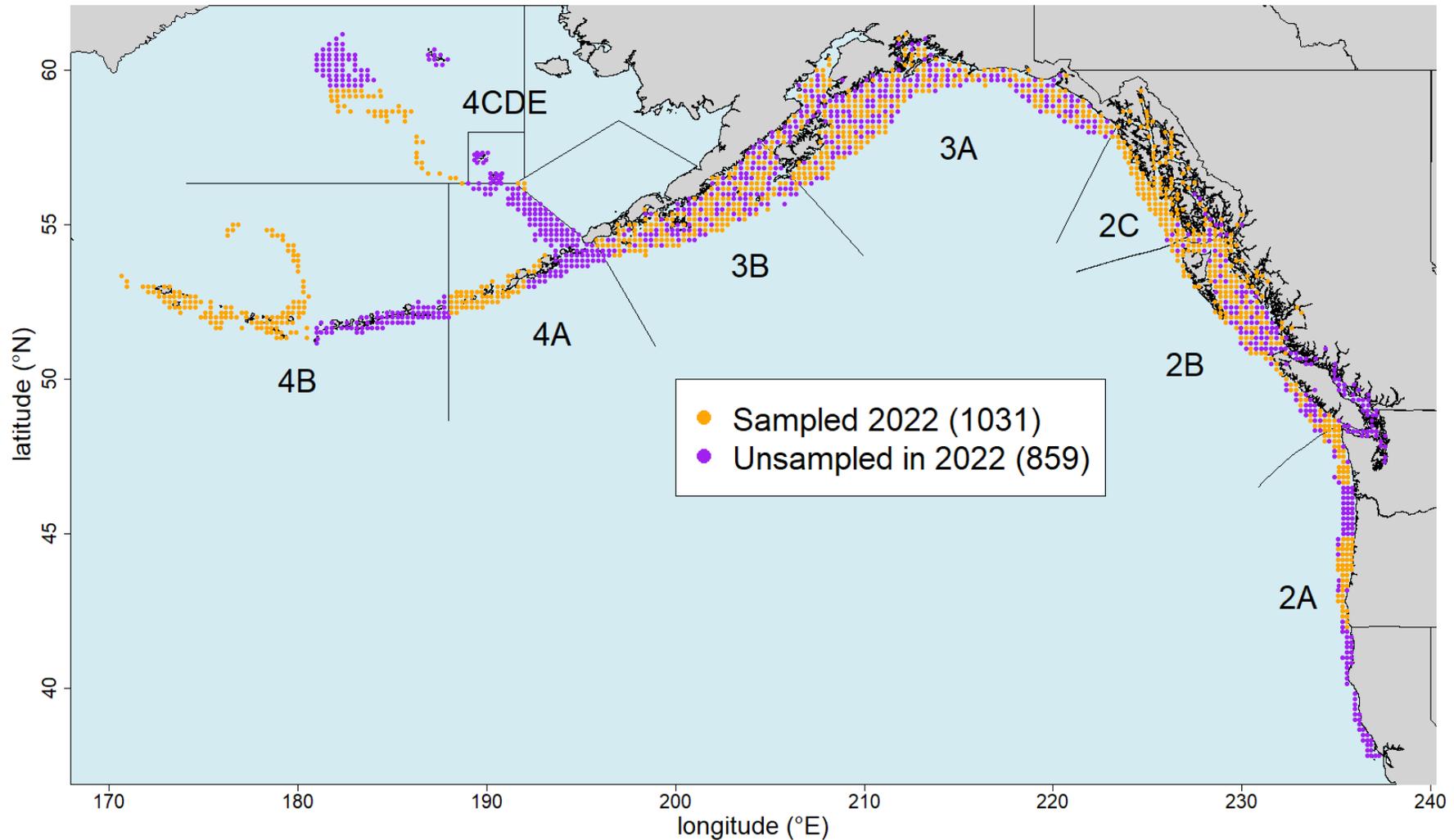
## APPENDIX IV

**OPTIMIZED FISS DESIGN FOR 2022 (ORANGE CIRCLES) WITH ORIGINAL DESIGN ENDORSED AT SRB018 AUGMENTED WITH ADDITIONAL STATIONS IN IPHC REGULATORY AREAS 2B, 2C, 3A, AND 3B IN ORDER TO HELP ACHIEVE THE SECONDARY OBJECTIVE OF LONG-TERM REVENUE NEUTRALITY. PURPLE CIRCLES ARE OPTIONAL FOR MEETING DATA QUALITY CRITERIA**



## APPENDIX V

**ALTERNATIVE : OPTIMIZED FISS DESIGN FOR 2022, WITH ORIGINAL DESIGN ENDORSED AT SRB018 MODIFIED TO REMOVE NORTHERN BERING SEA SHELF EDGE STATIONS FISHED IN 2021 AUGMENTED WITH ADDITIONAL STATIONS IN IPHC REGULATORY AREAS 2B, 2C, 3A, AND 3B IN ORDER TO HELP ACHIEVE THE SECONDARY OBJECTIVE OF LONG-TERM REVENUE NEUTRALITY. PURPLE CIRCLES ARE OPTION AL FOR MEETING DATA QUALITY CRITERIA**



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**APPENDIX VI****CONSOLIDATED SET OF RECOMMENDATIONS AND REQUESTS OF THE 97<sup>TH</sup> SESSION OF THE  
IPHC INTERIM MEETING (IM097) (30 NOVEMBER – 1 DECEMBER 2021)****RECOMMENDATIONS*****IPHC Fishery regulations: Proposals for the 2021-22 process***

IM097-Rec.01 ([para. 67](#)) The Commission **RECOMMENDED** that interested stakeholders note the deadline for submission of IPHC Fishery Regulation proposals, for consideration at the 98<sup>th</sup> Session of the Annual Meeting (AM098), of **25 December 2021**. Late proposals will not be considered at AM098, but stakeholders may also submit statements up until the day before the AM098. More information is available via the IPHC website: <https://iphc.int/the-commission/fishery-regulations/>

**REQUESTS*****IPHC Fishery-Independent Setline Survey (FISS) design and implementation in 2021***

IM097-Req.01 ([para. 24](#)) The Commission **REQUESTED** that the IPHC Secretariat develop and provide a time series representation of depredation, in particular whale depredation, and other reasons for ineffective sets, at future Interim and Annual meetings.

***2022-24 FISS design evaluation***

IM097-Req.02 ([para. 33](#)) The Commission **REQUESTED** further information be provided intersessionally, on how secondary and tertiary FISS objectives are incorporated into the final FISS design (using the optimized FISS 2022 option 1 design as a working example).