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2026-28 FISS Design Evaluation

Agenda item: 4.2.2 IPHC-2025-SRB026-09 (R. Webster, I. Stewart, K. Ualesi, T. Jack, D. Wilson)



IPHC FISS

- Our most important source of data on Pacific halibut
- Provides data for estimating weight and numbers per unit effort (WPUE and NPUE) indices of density and abundance of Pacific halibut
 - Used to estimate stock trends
 - Used to estimate stock distribution
 - Important input in the IPHC stock assessment
- Provides biological data for use in the stock assessment
- An annual FISS has been undertaken since 1993
 - Design expanded from 1993-2000 to include sampling in all IPHC Regulatory Areas
 - Further expansion into previously unsampled waters during 2011-2019 period



Full FISS grid



Finite survey resources

- The full FISS grid cannot be sampled each year
 - Logistically challenging and cost prohibitive
- We prioritize sampling effort based on:
 - **1.** Scientific needs:
 - Precise estimates of indices of abundance and stock distribution with low potential for bias
 - Requires more frequent sampling in areas with higher variability
 - 2. Long-term revenue neutrality:
 - Increase effort in revenue-positive areas to offset cost of sampling low-density habitat
 - Potentially reduce effort in high-cost areas to avoid large deficits



FISS objectives and design layers

Priority	Objective	Design Layer		
Primary	Sample Pacific halibut for stock	Minimum sampling requirements in terms of:		
	assessment and stock distribution	Station distribution		
	estimation	Station count		
		Skates per station		
Secondary	Cost effectiveness without	Logistics, cost, scientific integrity: operational		
	compromising the scientific integrity	feasibility and cost/revenue, and scientific needs.		
	of the FISS design.	With an aspirational target reserve of		
		US\$2,000,000		
Tertiary	Minimize removals and assist others	Removals: minimize impact on the stock while		
	where feasible on a cost-recovery	meeting primary priority		
	basis.	Assist: assist others to collect data on a cost-		
		recovery basis		
		IPHC policies: ad-hoc decisions of the		
		Commission regarding the FISS design		



Annual FISS design review/analysis timeline st

Stakeholder input



IPHC FISS 2020-25

- 2020: Rationalized FISS design approved
 - Random sampling in core areas (2B, 2C, 3A, 3B)
 - Sampling of blocks of stations elsewhere prioritized to maintain precise estimates with low bias
 - FISS reduced to core areas only due to COVID19
- 2021-22: Proposed design largely implemented
 - Western 4B not sampled in 2022 due to lack of viable bids
- 2023-25: Reduced designs implemented to lower costs
 - Little sampling outside core areas in 2023, with no FISS sampling in 4A, 4B or 4CDE
 - Further reductions in 3A and 3B in 2024, but some sampling in 4CDE
 - 2025 sampling in 3A and 3B to complement 2023-24 sampling; sampling higher density parts of 2A and 4A/4B for first time since 2022



Most recent sampling year by station



Planned 2025 design



Potential designs for 2026-28

- Until last year, initial FISS designs targeted a random selection of stations in the core IPHC Regulatory Areas (2B, 2C, 3A and 3B).
- This method for station selection was chosen in 2019 over a proposal to instead fish a selection of charter regions as blocks of stations.
- In September 2023, the Commission directed IPHC Secretariat to evaluate potential block designs for future FISS sampling
 - Reduced running time between stations in a block design leads to greater operational efficiency, an important consideration in bringing these designs forward.



Potential designs for 2025-27

- In 2023-24, a **Base Block design** was evaluated for the Commission's consideration for the subsequent three-year period:
 - Prioritizes some annual sampling in each Biological Region for stock assessment purposes.
 - Ensures all charter regions in the core of the stock (2B, 2C, 3A and 3B) are sampled over a three-year period
 - Coverage in other areas is prioritized to minimize bias potential and maintain CVs below 25%
- The sampled blocks (charter regions) would be rotated over time.







Potential Base Block designs 2026-28

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Projected coefficients of variation* (CVs)

Regulatory	Base Block			
Area	2026	2027	2028	
2A	21	22	14	
2B	11	7	10	
2C	6	6	6	
3A	8	7	8	
3B	11	15	11	
4A	18	22	13	
4B	15	16	17	
4CDE	9	9	8	
Biological Region				
Region 2	6	5	5	
Region 3	7	7	7	
Region 4	9	10	7	
Region 4B	15	16	17	
Coastwide	4	4	4	

* For terminal year of time series. Projected using IPHC's space-time modelling.

2026 Base Block design

Preliminary projected net revenue (US\$): -\$1,818,000

Evaluation of potential Base Block design

- Projected terminal year CVs 25% or less for all IPHC Regulatory Areas; 15% or less for core areas (2B, 2C, 3A and 3B).
- All Biological Region CVs except Region 4B projected below 10%.
- Coastwide CV is projected to be 4% in all years.
- Therefore, this design is **projected to maintain precise estimates** of indices of Pacific halibut density and abundance across the range of the stock.
- By rotating the sampled blocks, almost all FISS stations are sampled within a 5-year period (2-3 years within the core areas) resulting in **a low risk of large bias** in estimates of trend and stock distribution.

Reduced Loss design

- The Base Block design is preliminarily projected to result in a substantial operating loss for the FISS and would require supplementary funding
- Therefore, we developed an alternative design with a more feasible preliminary projected net operating loss of close to US\$0.5 million
- This Reduced Loss design includes:
 - Revenue positive charter regions in IPHC Regulatory Areas 2B and 2C (one charter region each)
 - Three other charter regions, one in each of IPHC Regulatory Areas 2B, 2C and 3A, with 30 stations subsampled per region (53-58% of total stations in each region)
 - The three subsampled charter regions were prioritized as they were among the regions not sampled in the most recent 1-2 years

2026 Reduced Loss design

Preliminary projected net revenue (US\$): -\$536,000

Note: stations shown in partially-sampled charter regions (2B and 3A) are only for the purpose of illustrating the spatial extent of the design.

Evaluation of potential Reduced Loss design

- Limited spatial coverage leads to increased risk of bias relative to Base Block design
 - Greater risk that important stock changes are unobserved
 - Space-time model estimates for unsampled regions begin to drift towards long-term mean in the absence of data
- Increased uncertainty in estimates of density indices
 - Assessment model will rely more heavily on commercial CPUE index, as it did in 2024
- Unclear if assessment model will detect a major change in year class abundance due to:
 - Current spatial variability and uncertainty in magnitude of younger year classes (2016 and younger)
 - Limited biological information from Biological Region 3 in the stock's core

Intermediate 2026 designs

- Secretariat staff has prepared several designs intermediate to the Base Block and Reduced Loss designs
 - Could be considered if supplementary funding becomes available or if greater losses are considered acceptable to the Commission
- Together with the Reduced Loss (Option 1) and Base Block (Option 7) designs, these designs comprise seven preliminary FISS design options for 2026

Preliminary projected net revenue (US\$): -\$556,000

Partial charter regions in Reduced Loss design are fully sampled

Preliminary projected net revenue (US\$): -\$860,000

Adds sampling in IPHC Regulatory Area 4B to Option 2

Preliminary projected net revenue (US\$): -\$1,012,000

Adds a charter region in IPHC Regulatory Area 3B to Option 3

Preliminary projected net revenue (US\$): -\$1,240,000

Adds a charter region in IPHC Regulatory Area 4A to Option 4

Preliminary projected net revenue (US\$): -\$1,740,000

Includes all stations in the Base Block design, together with three revenuepositive regions in Biological Region 2 that are not part of that design.

Preliminary net revenue projections for 2026

otions:	Design	Sampled IPHC Regulatory Areas	Projected net	Difference	
signs are optimized for		(with number of FISS charter regions)	revenue (ŞUS)	(\$U\$)	
Impers of skates, with 4, 6	Option 1: Reduced Loss	2B(2 full, 2 partial), 2C(3), 3A(1 partial)	-536,000		
pending on projected catch	Option 2	2B(4), 2C(3), 3A(1)	-556,000	-20,000	
tes and bait costs.	Option 3	2B(4), 2C(3), 3A(1), 4B(1)	-860,000	-304,000	
25 Pacific halibut price and	Option 4	2B(4), 2C(3), 3A(1), 3B(1), 4B(1)	-1,012,000	-152,000	
landings do not change from values realized in 2024.	Option 5	2B(4), 2C(3), 3A(1), 3B(1), 4A(1), 4B(1)	-1,240,000	-228,000	
	Option 6	2B(4), 2C(3), 3A(4), 3B(2), 4A(1), 4B(1)	-1,740,000	-500,000	
	Option 7: Base Block	2B(2), 2C(2), 3A(4), 3B(2), 4A(1), 4B(1)	-1,818,000	-78,000	
	esigns are optimized for mbers of skates, with 4, 6 8 skate-sets used, pending on projected catch ces and bait costs. 25 Pacific halibut price and ndings do not change from lues realized in 2024.	Designesigns are optimized for mbers of skates, with 4, 6 8 skate-sets used, pending on projected catch ces and bait costs.Option 1: Reduced LossOption 2 Option 3Option 2 Option 325 Pacific halibut price and ndings do not change from lues realized in 2024.Option 5 Option 6 Option 7: Base Block	DesignSampled IPHC Regulatory Areas (with number of FISS charter regions)esigns are optimized for mbers of skates, with 4, 6 8 skate-sets used, pending on projected catch ces and bait costs.Option 1: Reduced Loss 0ption 22B(2 full, 2 partial), 2C(3), 3A(1 partial)Option 20ption 22B(4), 2C(3), 3A(1)25 Pacific halibut price and ndings do not change from lues realized in 2024.Option 42B(4), 2C(3), 3A(1), 3B(1), 4B(1)Option 52B(4), 2C(3), 3A(1), 3B(1), 4A(1), 4B(1)Option 62B(4), 2C(3), 3A(4), 3B(2), 4A(1), 4B(1)Option 7: Base Block2B(2), 2C(2), 3A(4), 3B(2), 4A(1), 4B(1)	DesignSampled IPHC Regulatory Areas (with number of FISS charter regions)Projected net revenue (\$US)Projected net revenue (\$US)Option 1: Reduced Loss2B(2 full, 2 partial), 2C(3), 3A(1 partial)-536,0008 skate-sets used, pending on projected catch ces and bait costs.Option 22B(4), 2C(3), 3A(1), 4B(1)-556,0000ption 32B(4), 2C(3), 3A(1), 4B(1)-860,000-556,00025 Pacific halibut price and ndings do not change from lues realized in 2024.Option 42B(4), 2C(3), 3A(1), 3B(1), 4B(1)-1,012,0000ption 62B(4), 2C(3), 3A(4), 3B(2), 4A(1), 4B(1)-1,240,000-1,740,000-1,740,0000ption 7: Base Block2B(2), 2C(2), 3A(4), 3B(2), 4A(1), 4B(1)-1,818,000	

- Cost estimates are largely based on information from the 2024 FISS and outcomes of the 2025 charter bidding process and it is important to note there is high uncertainty in any catch and cost projections for 2026 this far in advance.
- Final cost and accounting information will be available at the end of the 2025 fiscal year and will be used to refine these preliminary projections at that time.

Discussion

- Like the adopted 2024-25 FISS designs, the 2026 Reduced Loss design would result in less information available for the annual stock assessment and management supporting calculations such as the stock distribution than in years prior to 2024. In addition to the points on Slide 18, we note that:
 - Basic stock assessment methods can remain unchanged, but a greater portion of the uncertainty in stock trend and demographics will not be quantified due to missing FISS data from a large fraction of the Pacific halibut stock's geographic range.
 - The implications for the assessment would be of increasing concern if designs like the Reduced Loss design were implemented beyond 2026 due to increasing uncertainty and risk of bias in stock trend estimates and the unrepresentativeness of the biological samples.
 - Reduced stakeholder confidence in the FISS results and in the aggregate scientific information from the stock assessment (as evident at AM100 and AM101) will result from FISS designs that do not fully inform stock distribution with annual sampling in all IPHC Biological Regions.
- We again emphasise the preliminary nature of all net revenue projections it is likely that potential designs will change once costs and catch rates are updated following the 2025 FISS.
 - Revised designs will be presented to the SRB for review at SRB027 in September

Recommendation

That the Scientific Review Board **NOTE** paper IPHC-2025-SRB026-09, which presents an evaluation of design options for 2026-28, including a preliminary option accounting for the secondary FISS objective of cost effectiveness.

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