

INTERNATIONAL PACIFIC



HALIBUT COMMISSION

# 2025 and 2026-29 FISS Designs

Agenda item: 3

IPHC-2024-SS014-03

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# Background to Special Session

- At the Work Meeting in September 2024, the Commission provided the following directive to the IPHC Secretariat regarding the IPHC's Fishery-Independent Setline Survey (FISS):
  - “NOTING the three (3) Fishery-Independent Setline Survey (FISS) block design options described in paper IPHC-2024-WM2024-10 (base, core and reduced core), and modular add-on options, the Commission **DIRECTED** the Secretariat to provide a new paper for the FISS design that contains the following elements (by 30 September 2024):
    - a. A section that depicts the optimal five-year rotational FISS design and its associated costs and revenue;
    - b. A section that proposes a fiscally viable FISS design option for 2025, that contains both likely funding options (Fish sales, IPHC Reserve, Contracting Party supplementary funding), as well as potential ad-hoc supplementary funding, and associated modular add-ons (prioritized), while highlighting potential bias that would result from each;
    - c. Potential other sources of funding to complement existing/known funding options, that will be further explored;
    - d. An explanation of the potential bias that may result from the designs described above.”

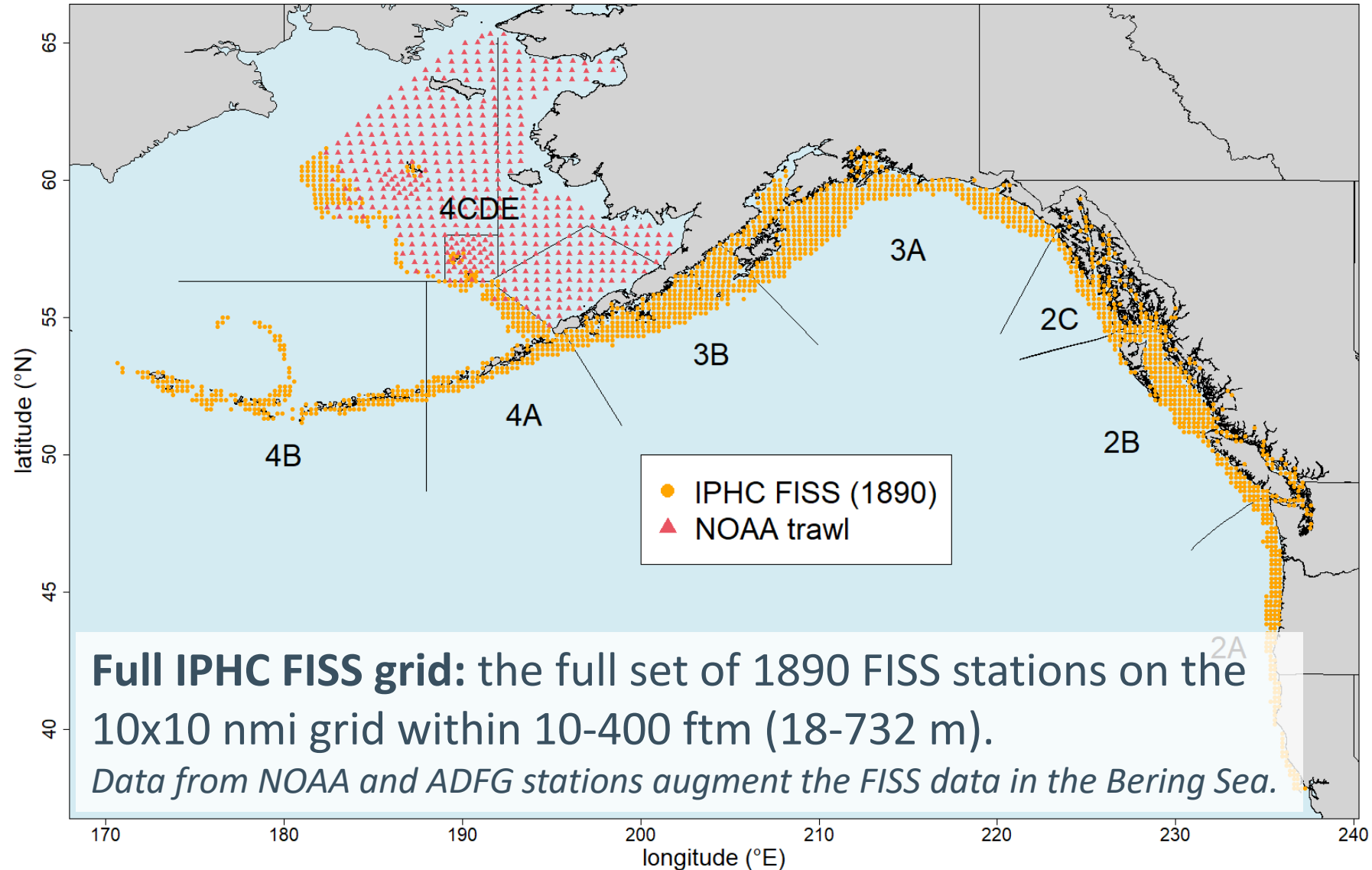


# IPHC FISS

- 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 <u>Pacific halibut</u> 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 <u>revenue neutrality</u>  | Logistics and cost: operational feasibility and cost/revenue neutrality  |
| Tertiary  | <u>Minimize removals</u> , and <u>assist others where feasible</u> on a cost-recovery basis. | Removals: minimize impact on the stock while meeting primary priority<br><br>Assist: assist others to collect data on a cost-recovery basis<br><br>IPHC policies: ad-hoc decisions of the Commission regarding the FISS design |

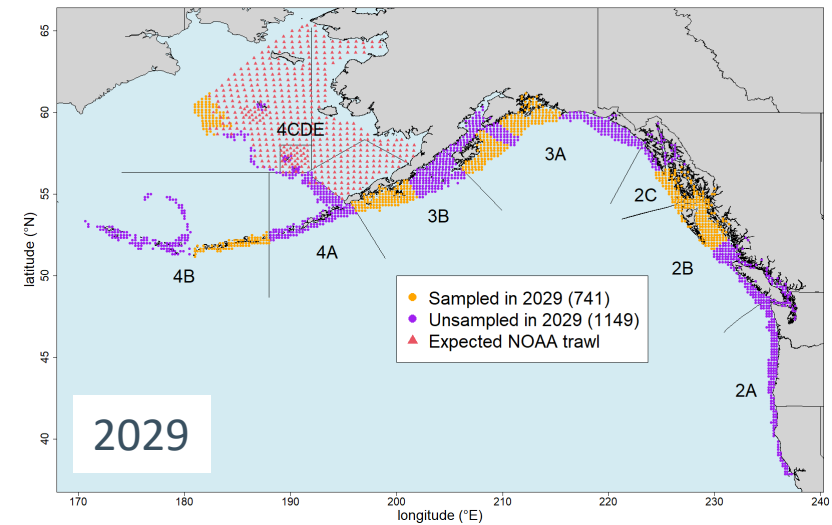
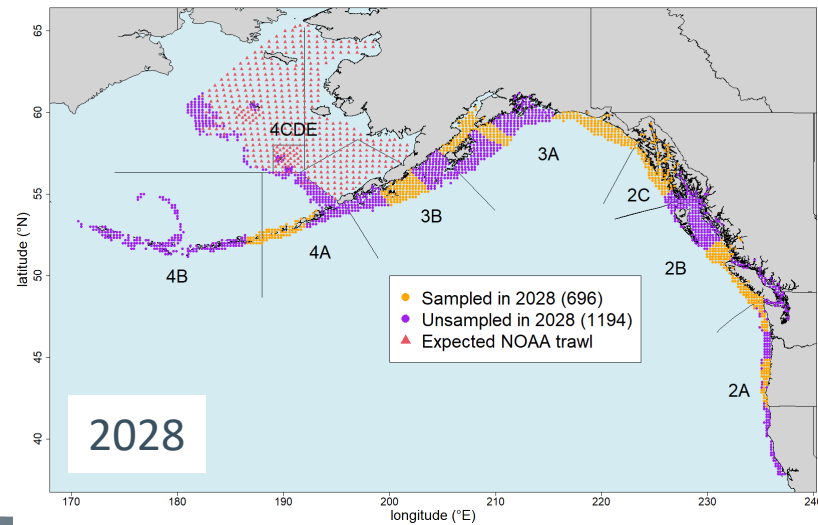
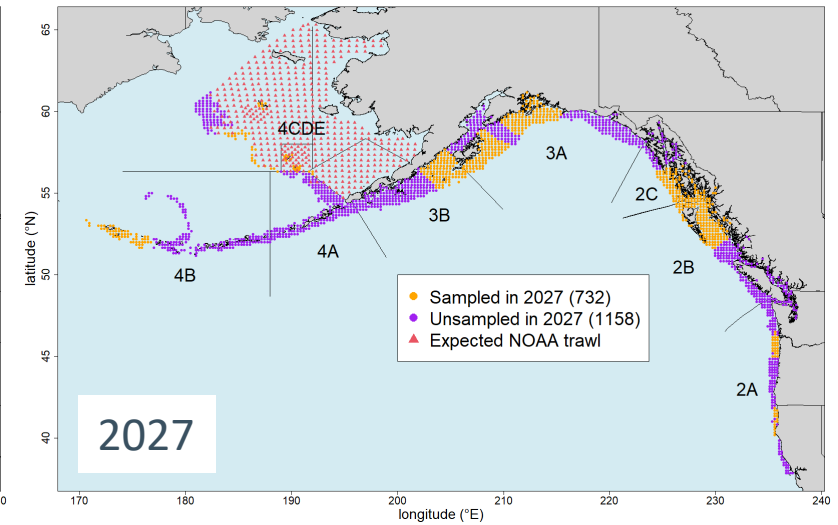
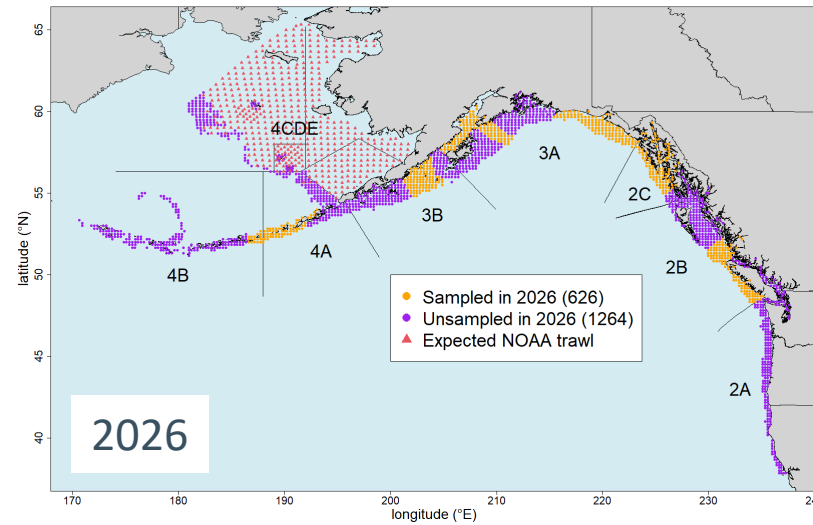
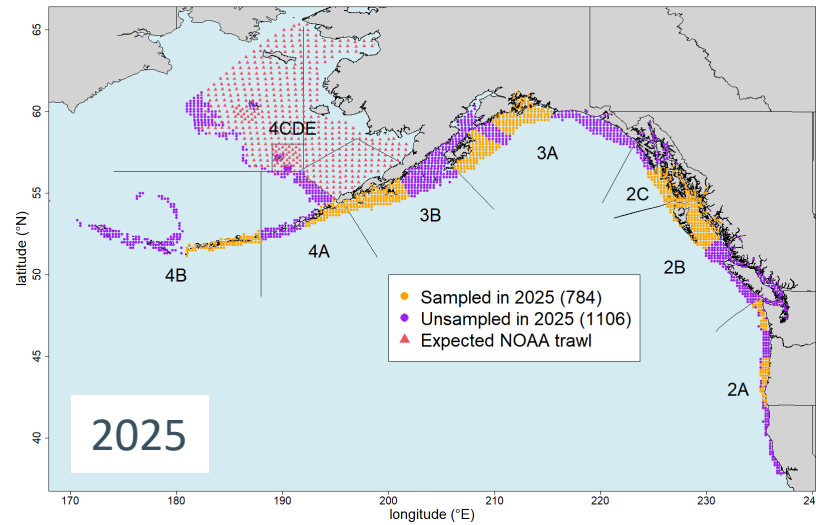


# Part A: Optimal five-year rotational design

- A **Base Block design** was presented to Commissioners at WM2024 for 2025-29
  - 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, resulting in CVs for abundance indices of no more than 15%
  - Coverage in other areas is prioritized to minimize bias potential and maintain CVs below 25%
- The sampled blocks (charter regions) are rotated over time.
- 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.



# Base block designs 2025-29





# 2025 Base Block Design: projected costs and revenue

| 2025                            | \$                    | Notes   |
|---------------------------------|-----------------------|---|
| <b>Total Projected Cost</b>     | US\$3,829,000         | <b>Base HQ costs:</b> US\$606,000 (incurred even if no FISS is conducted)   |
|                                 |                       | <b>Vessel bids:</b> \$1,525,000   |
|                                 |                       | <b>Field staff:</b> \$459,000   |
|                                 |                       | <b>Bait estimate:</b> \$356,000   |
| <b>Total Projected Revenue*</b> | US\$\$1,771,000       | US\$1,692,000 from Pacific halibut sales<br>US\$79,000 from byproduct sales |
| <b>Net</b>                      | <b>–US\$2,058,000</b> | <b>Not fiscally possible without a large influx of supplementary funds.</b> |

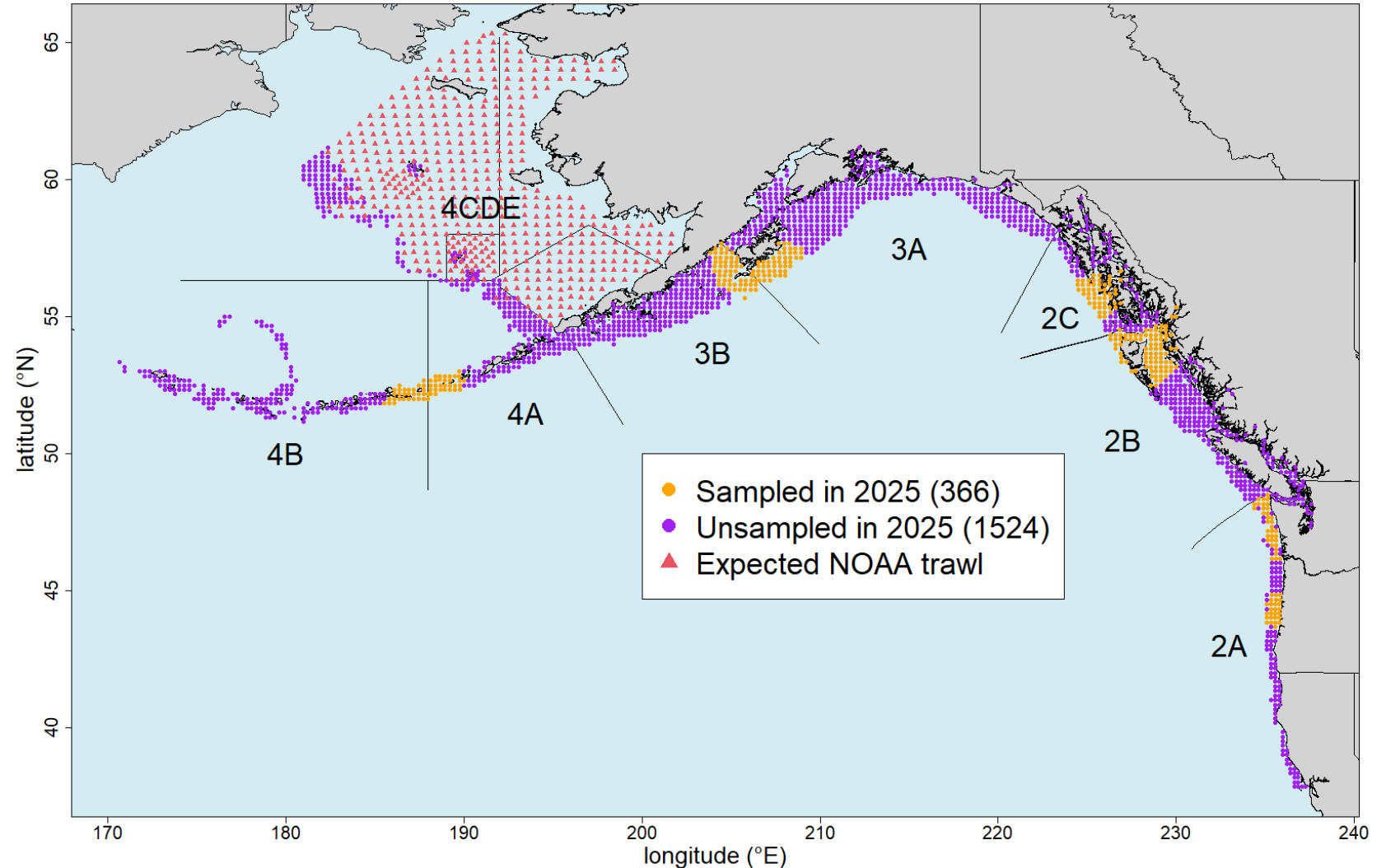
Assumptions:

- 1) no bid inflation for 2025 (compared to 2024);
- 2) 5% decline in landings from observed 2024 rates;
- 3) no change in average price.



# Part B: Fiscally viable design for 2025

- One charter region in each of 2B and 2C
  - Projected to reduce losses relative to no FISS
- One charter region in each of 3A and 3B
  - Maintains some sampling in Region 3
- 60 stations in each of 2A and 4A/4B covered by supplementary funding



# 2025 Fiscally viable design: projected costs and revenue

| 2025                                 | \$                  | Notes  |
|--------------------------------------|---------------------|--|
| <b>Total Projected Cost</b>          | US\$2,102,000       | <b>Base HQ costs:</b> US\$606,000 (incurred even if no FISS is conducted)<br><b>Vessel bids:</b> \$691,000<br><b>Field staff:</b> \$197,000<br><b>Bait estimate:</b> \$179,000 |
| <b>Total Projected Revenue*</b>      | US\$1,141,000       | US\$1,098,000 from Pacific halibut sales<br>US\$43,000 from byproduct sales  |
| <b>Supplementary funding (known)</b> | US\$387,000         | USA Supplementary funding (received) - for sampling in 2A and 4A/4B.   |
| <b>Net</b>                           | <b>-US\$574,000</b> | To be covered by any additional supplementary funding received in-year, and the IPHC Fund 50 (Reserve).  |



# Recommendation

The IPHC Secretariat recommends moving forward with the 2025 FISS design option described above (“fiscally viable design”) with the assumption that additional supplementary funding will become available in early 2025, and any remaining deficit will be covered by the IPHC Reserve Fund (50 – Reserve).

Should additional supplementary funding not become available, we are comfortable covering the full amount of the deficit from the Reserve Fund for one (1) year.



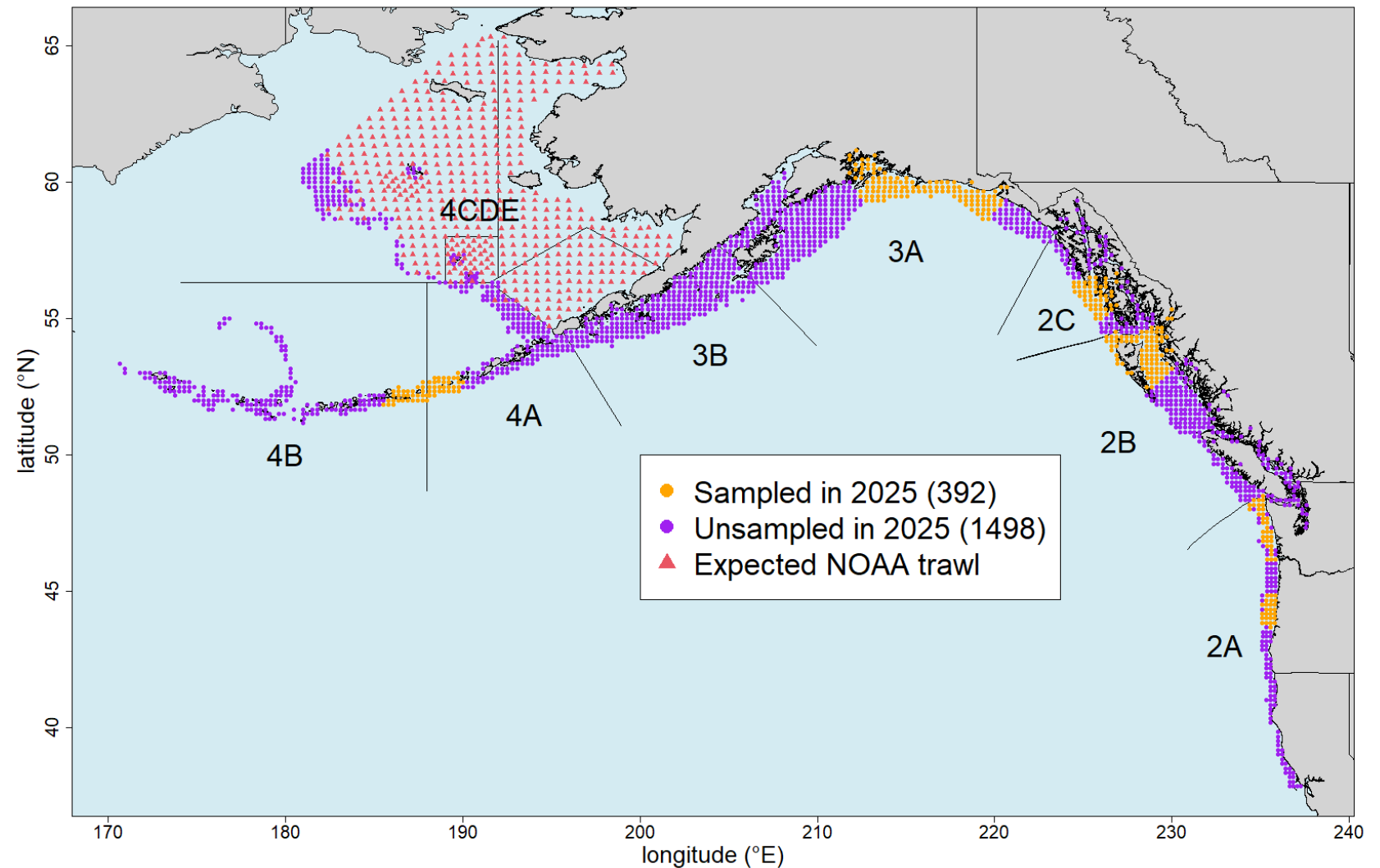
# Modified FISS design options

- The **fiscally viable design** meets basic data needs in terms of collecting samples from all Biological Regions
- However, this design samples FISS charter regions previously sampled in 2024 in IPHC Regulatory Areas 3A and 3B over regions sampled less recently
- Alternative designs that increase spatial coverage of the FISS over the short term would reduce the potential for bias by sampling charter regions not sampled in 2024:
  - Overall estimates for Region 3 would be improved if different charter regions could be sampled in 2025 (just as the Base Block design rotates sampled regions over time to minimize potential for bias).



# Modified design for 2025 ('Option 2')

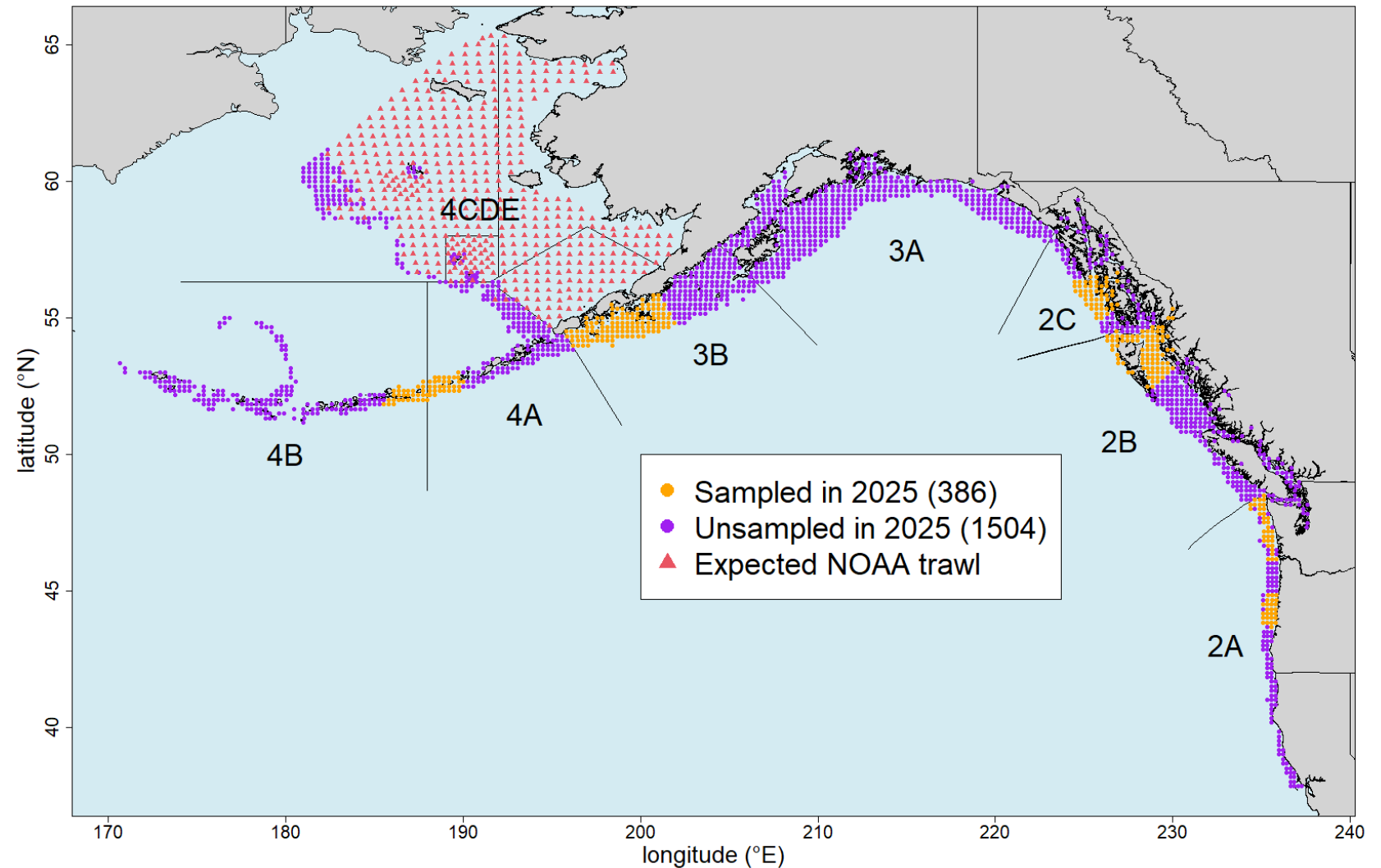
- Two high-priority charter regions in 3A
  - One last sampled in 2022, the other in 2023
- Design outside of Region 3 the same as the fiscally viable design
- Projected net revenue **-\$710,000** (vs **-\$574,000** for fiscally viable design)
- Includes \$387,000 in supplementary funding for 2A & 4A/4B





# Modified design for 2025 ('Option 3')

- Two high-priority charter regions in 3B
  - Both last sampled in 2023
- Design outside of Region 3 the same as the fiscally viable design
- Projected net revenue **-\$715,000** (vs **-\$574,000** for fiscally viable design)
- Includes \$387,000 in supplementary funding for 2A & 4A/4B



# Recommendation

The IPHC Secretariat does not recommended moving forward with Options 2 and/or 3 unless substantial supplementary funding becomes available before the end of November 2024. Substantial funding coming in after 30 November 2024 would not provide us with sufficient lead-in time to procure large quantities of bait, and secure FISS charter vessels.



# Part C: Potential other sources of funding

1. Supplementary funding from Contracting Party governments:
  - a. Over the course of FY2023 and FY2024, the Secretariat has received direct payments from both governments to supplement the annual FISS (Canada: US\$125,000 and USA: US\$114,000).
  - b. For FY2025, the USA has provided US\$387,000 for the FISS (received).
  - c. The Secretariat and both delegations will continue seeking supplementary funds in this form, in the short-term.
2. Large scale Contracting Party contributions:
  - a. The Secretariat has several calls out for substantial contributions from both governments, in excess of US\$2.5 million (Ref: Appendices I and II of IPHC-2023-SS014-03).
  - b. An ongoing engagement plan has been developed in conjunction with the Chairperson and Vice-Chairperson for this purpose.



# Part C: Potential other sources of funding

## 3. Supplementary funding from Contracting Party governments:

- a. The Secretariat is currently exploring options to incorporate a budget line for the FISS that is incorporated directly into the IPHC annual budgeting process. This would involve either an additional amount for the FISS each year, or a re-appropriation of funds within existing budget lines and budget trends. E.g. US\$50,000 to US\$200,000. For FY2025, the USA has provided US\$387,000 for the FISS (received).
- b. The first year this could apply to would be FY2026, noting the FY2025 budget contributions have already been paid by Canada, and the USA appropriations have been finalised.

## 4. Industry direct contributions:

- a. Throughout the course of 2023 and 2024, the Secretariat has received informal indications that some industry groups may be willing to offer direct funding for FISS activities in their areas of interest. There are both pros and cons of utilising industry funding direct from the industry source, that we would need to work through before taking this approach, such as conflicts of interest, and needing to change our internal regulations that currently prohibit such an approach.

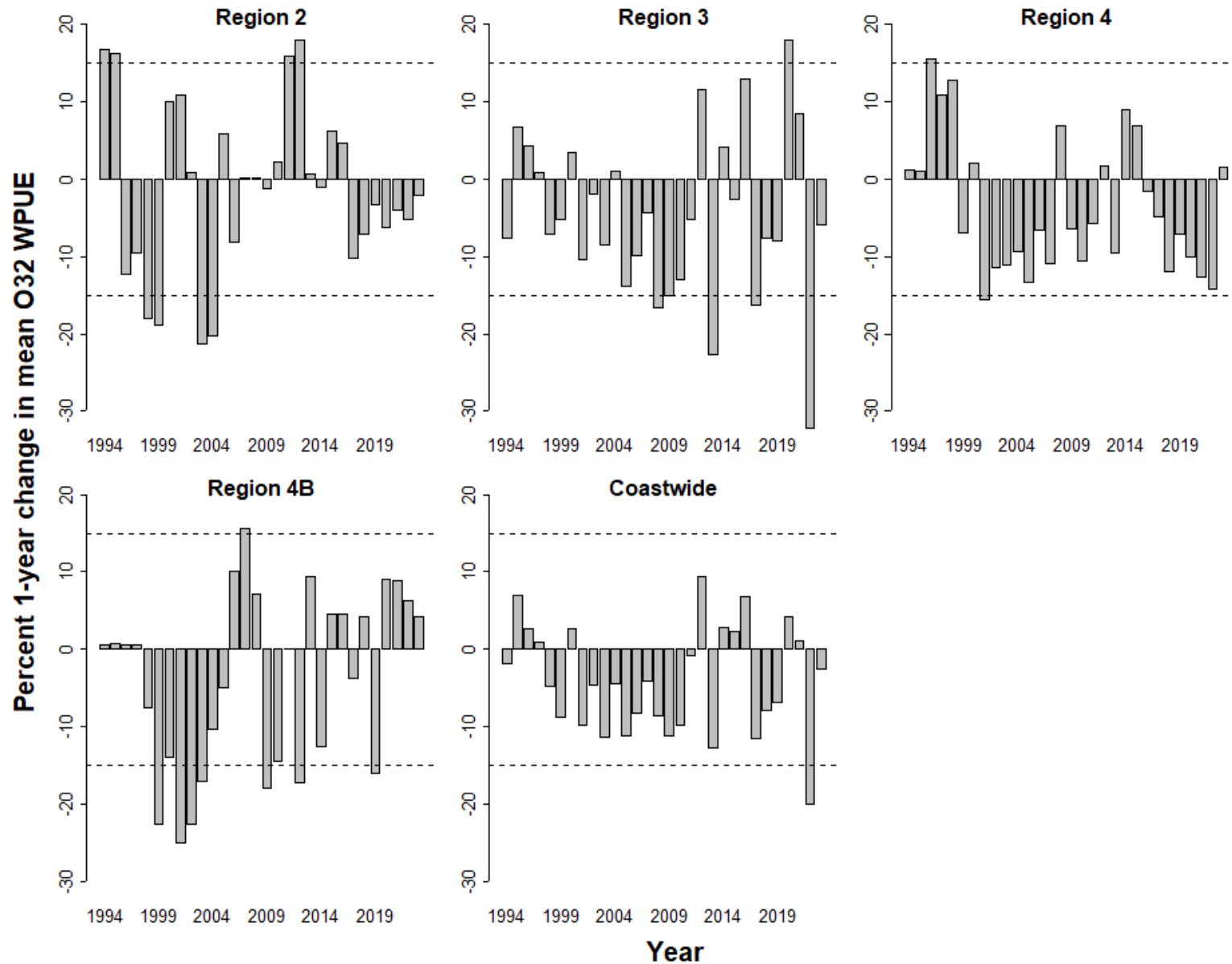


# Part D: Explanation of the potential for bias in FISS designs

- Indices of Pacific halibut density can change by large amounts over short periods, with annual changes of 15% or more regularly observed at the level of Biological Region and Regulatory Area
- Over a three-year period, large changes in indices of density are the norm, including at the coastwide level.
- Lack of sampling or low spatial coverage in an area or region means such changes are fully or largely unobserved, leading to biased estimates of indices, stock trends, and stock distribution.
- Designs such as that implemented in 2024 and proposed fiscally viable design therefore have high potential for bias in area, regional and coastwide estimates
  - Note that 2025 would be the second or third year with reduced coverage for much of the stock.

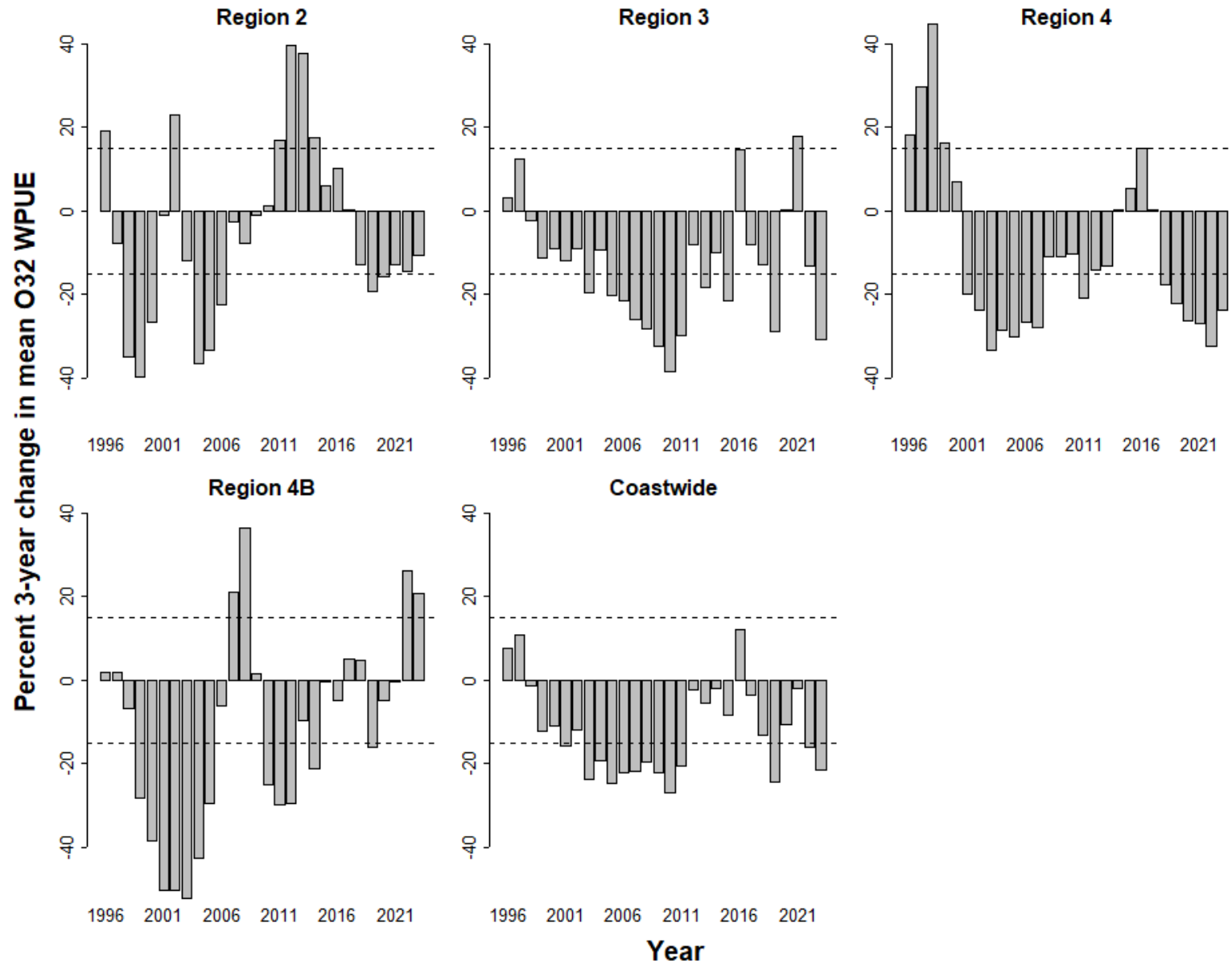


# Estimated 1-year changes in mean O32 WPUE by Biological Region





# Estimated 3-year changes in mean O32 WPUE by Biological Region



## Bias potential (cont.)

- The fiscally viable design would result in about 60% of habitat covered by either IPHC FISS or NOAA trawl sampling in 2025
- With this coverage and observed levels of change shown in previous slides, **we would expect coastwide indices of abundance to have bias of up to +/-15% following the 2025 FISS.**
- However, **bias could be much higher in Biological Regions 3 and 4B,** which would have had lower levels of sampling than the coast as a whole for two or more years following completion of the 2025 FISS.

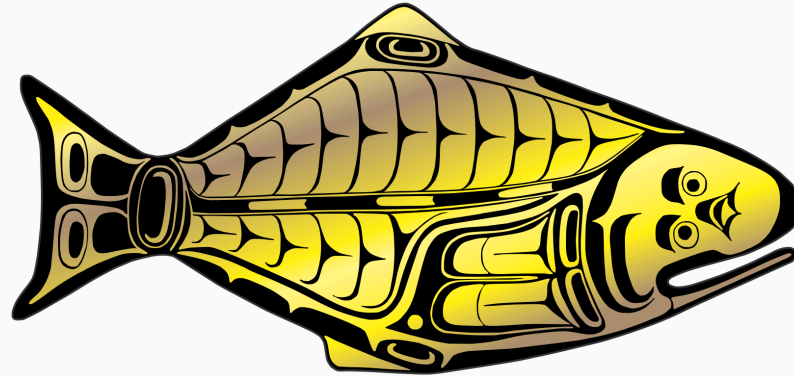


# Bias in stock assessment

- Recent simulation analyses explored the effect on stock assessment results of a cumulative bias in the FISS index of 15% over the upcoming period from 2025-2027 ([IPHC-2024-SRB025-06](#)).
- If the true FISS trend were going down by 15%, but due to a reduced design the FISS index was estimated to be flat over this same period, resulting estimates would be biased:
  - 2-3% overestimate of spawning biomass
  - 1% overestimate of SPR (underestimate of fishing intensity)
  - 9% underestimate of the probability of stock decline in 2028
- To account for a 9% underestimate of the probability of stock decline, the coastwide TCEY would need to be reduced by approximately 4 million pounds, equating to approximately US\$24 million in landed catch.
- Thus, under significantly reduced FISS designs, accounting for potential bias in management decisions could have a significant impact on short-term fishery yields and revenue.
- While the true degree of bias would be unknown, this level of bias (15%) is possible in the reduced designs evaluated here.



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