INTERNATIONAL PACIFIC HALIBUT COMMISSION

# 2025 and 2026-27 FISS Designs

Agenda item: 5.2.2

IPHC-2024-RAB025-08

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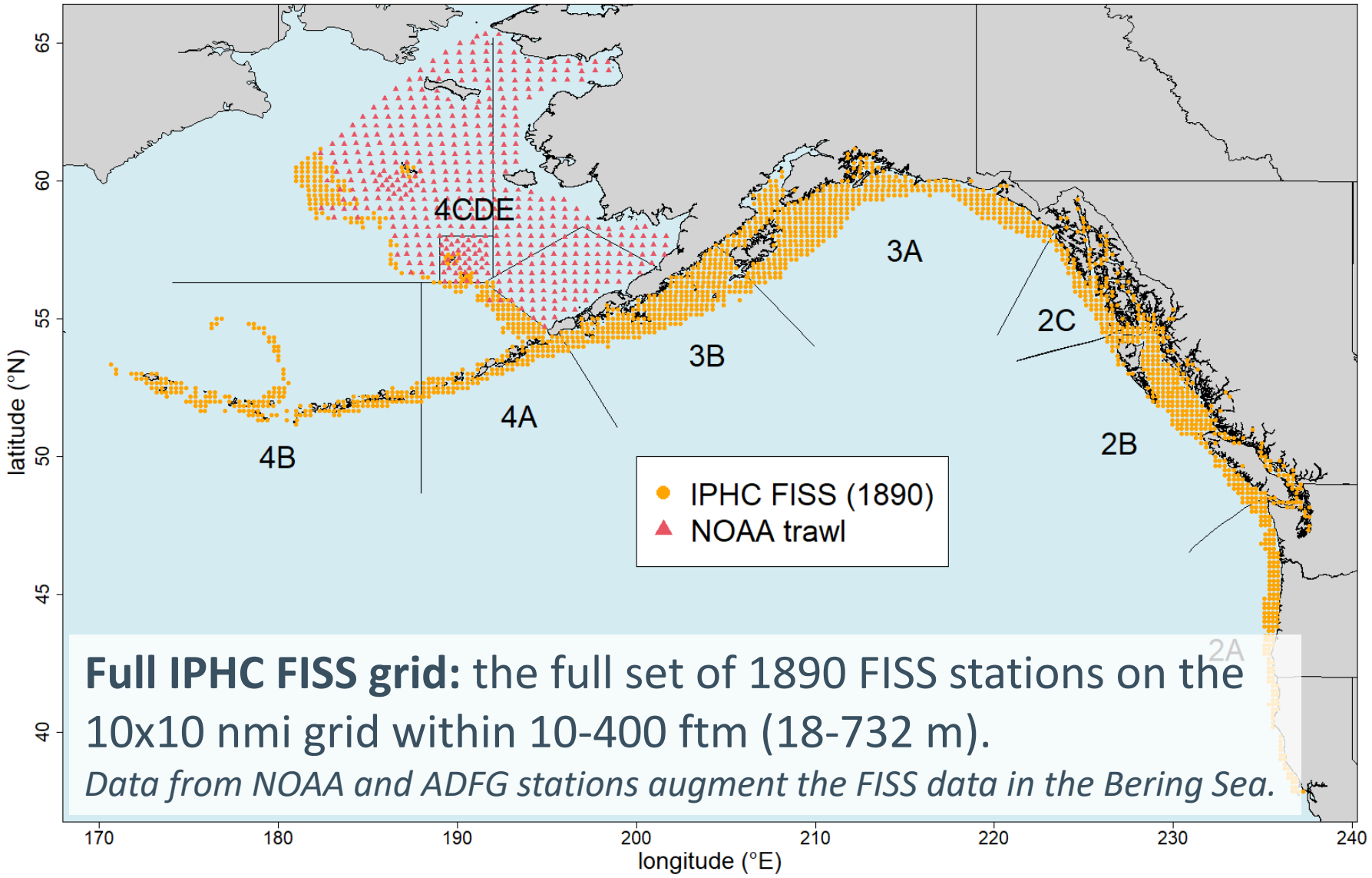
# IPHC FISS

- 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

# Background

- At the Commission Work Meeting (September 2024), the Commission was presented with three sets of FISS designs for 2025-29:
  - Two based on rotating blocks of stations (the Base Block and Core Block designs)
  - Another using reduced FISS coverage based on the implemented 2024 FISS design (the Reduced Core design).
- These sets of designs were intended to represent FISS coverage achievable under different levels of available supplementary funding.
- Here we focus on two designs considered by the Commission: the **Base Block design** (2025-27) which provides extensive sampling coverage over 3+ year period, and a **fiscally viable design** for 2025 that includes sampling in all IPHC Biological for lowest projected cost.

# Full FISS grid




**Full IPHC FISS grid:** the full set of 1890 FISS stations on the 10x10 nmi grid within 10-400 ftm (18-732 m).

*Data from NOAA and ADFG stations augment the FISS data in the Bering Sea.*

# 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

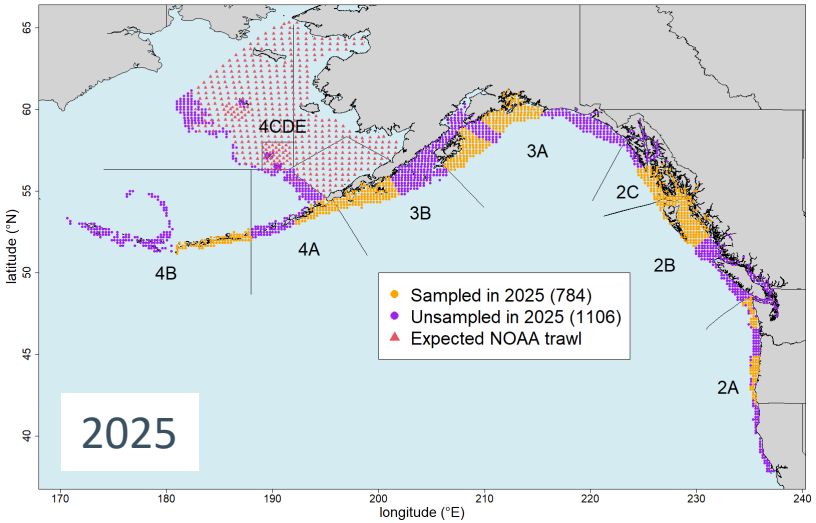
# FISS objectives and design layers

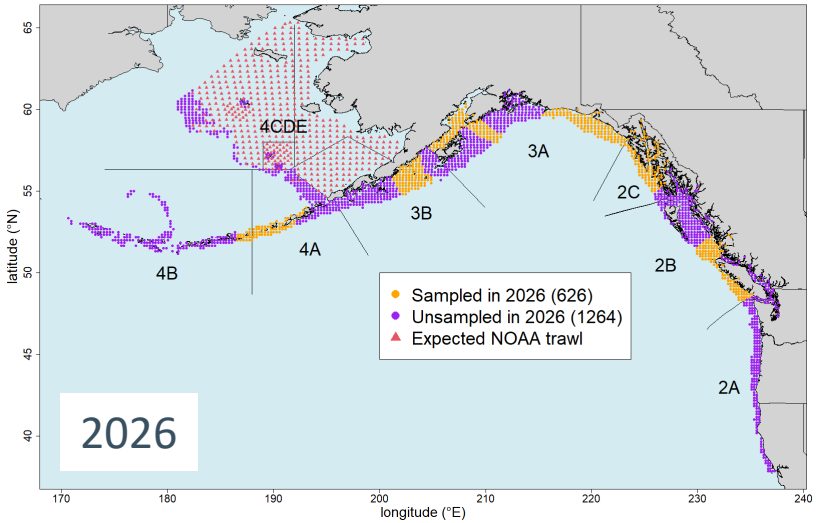
| Priority | Objective | Design Layer |
|---|---|---|
| **Primary** | Sample Pacific halibut for stock assessment and stock distribution estimation | Minimum sampling requirements in terms of:<br>• Station distribution<br>• Station count<br>• Skates per station |
| **Secondary** | Long term revenue neutrality | 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<br>Assist: assist others to collect data on a cost-recovery basis<br>IPHC policies: ad-hoc decisions of the Commission regarding the FISS design |

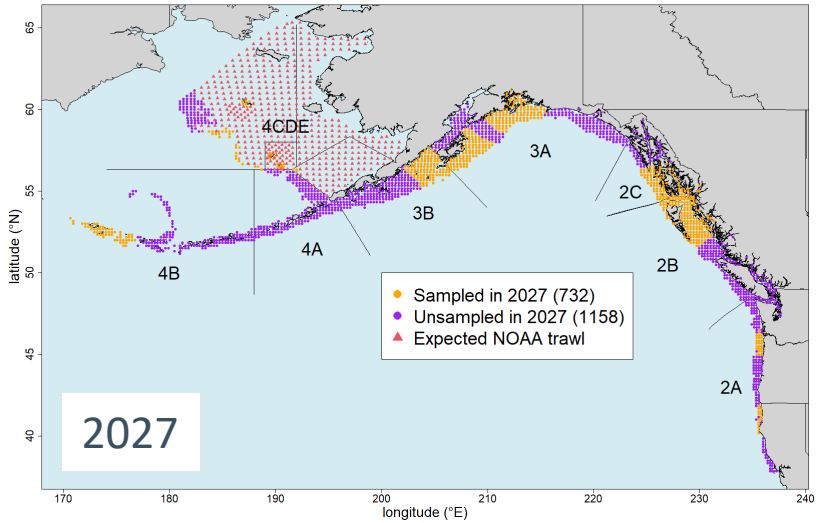
# Optimal five-year rotational design

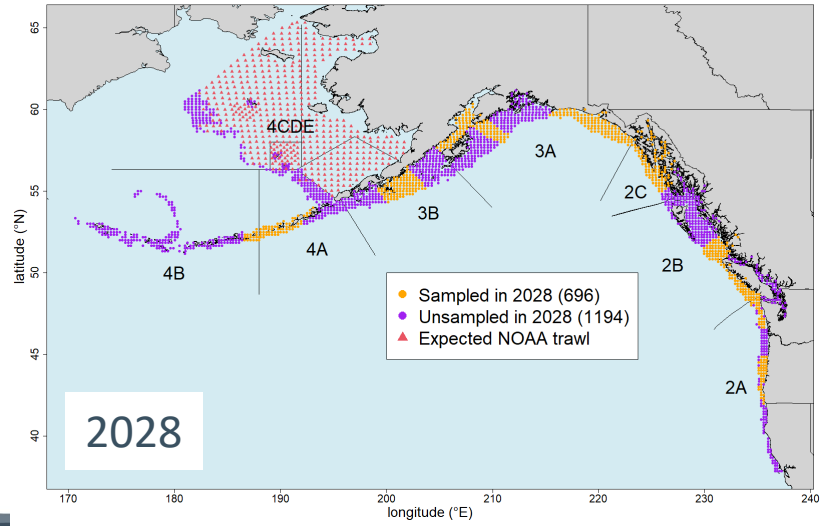
- A **Base Block design** was presented to Commissioners at WM2024 for 2025-29
  - Prioritizes some annual sampling in each Biological Region for stock assessment purposes.
  - Ensures all charter regions in the core of the stock (2B, 2C, 3A and 3B) are sampled over a three-year period, resulting in 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.

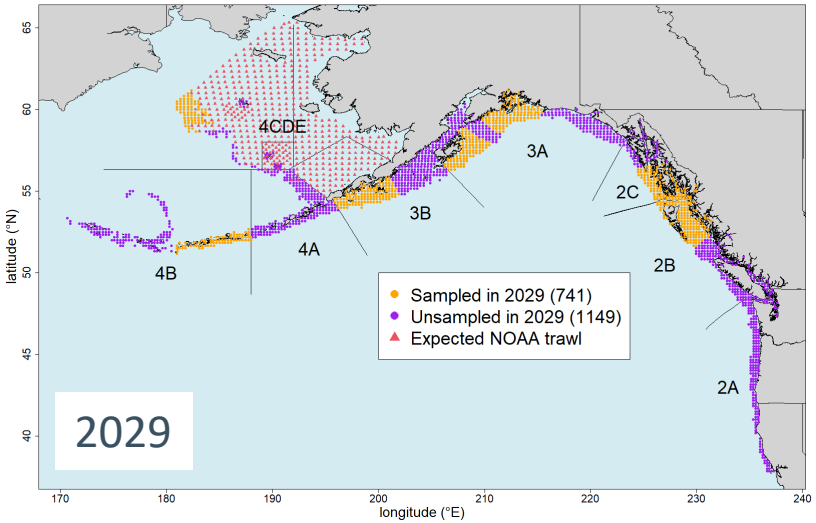
# Base block designs 2025-29



# 2025 Base Block Design: projected costs and revenue

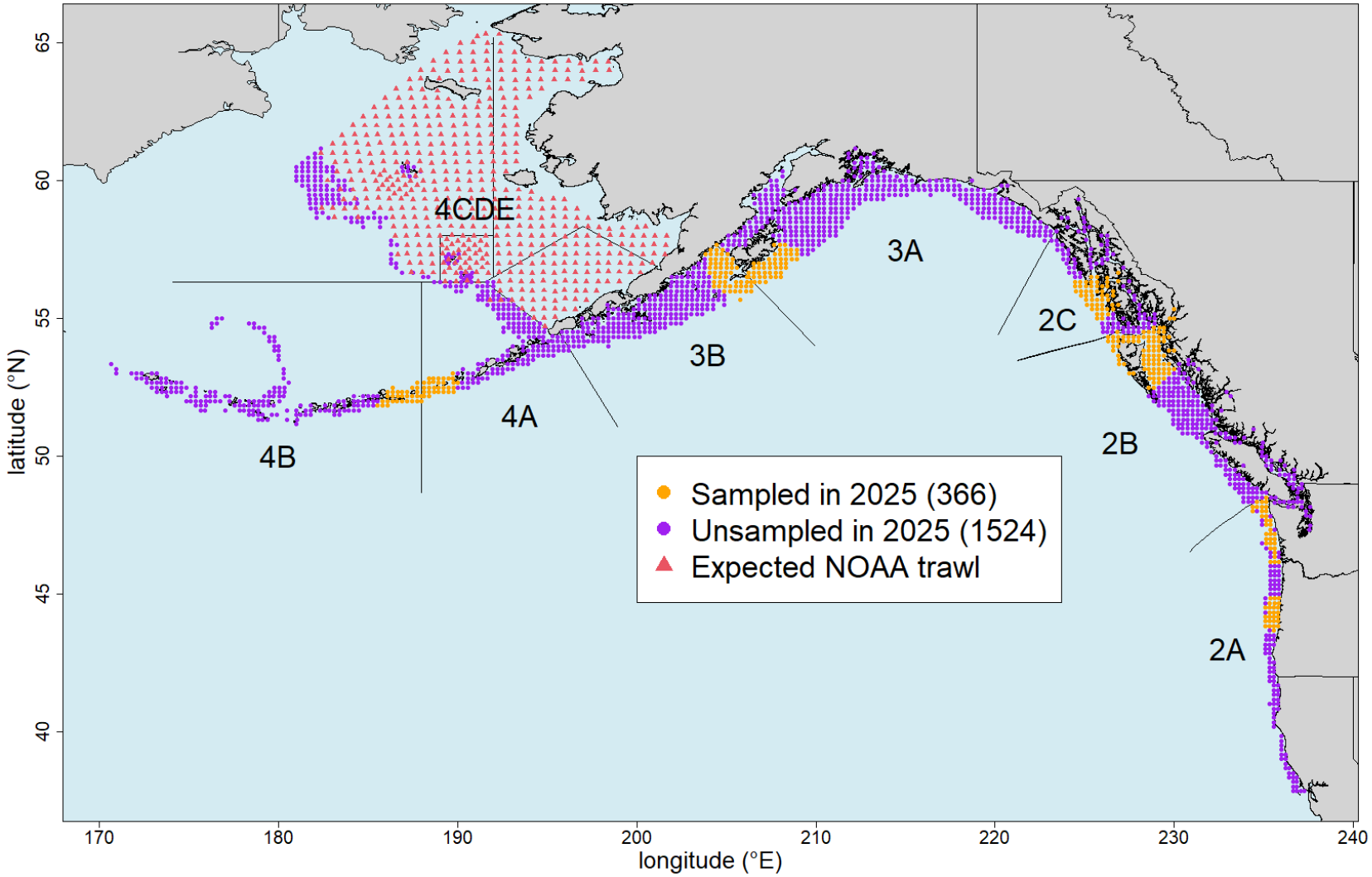
| 2025 | $ | Notes |
|---|---|---|
| **Total Projected Cost** | US$3,829,000 | **Base HQ costs:** US$606,000 (incurred even if no FISS is conducted)<br>**Vessel bids:** $1,525,000<br>**Field staff:** $459,000<br>**Bait estimate:** $356,000 |
| **Total Projected Revenue*** | US$$1,771,000 | US$1,692,000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

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

# Recommendation to the Commission

The IPHC Secretariat recommended that the Commission move 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.

# Potential for bias in reduced 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 the 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.

# 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.

# Recommendation

That the Research Advisory Board **NOTE** paper IPHC-2024-RAB025-08 that presents potential FISS designs for 2025, 2026, and 2027.

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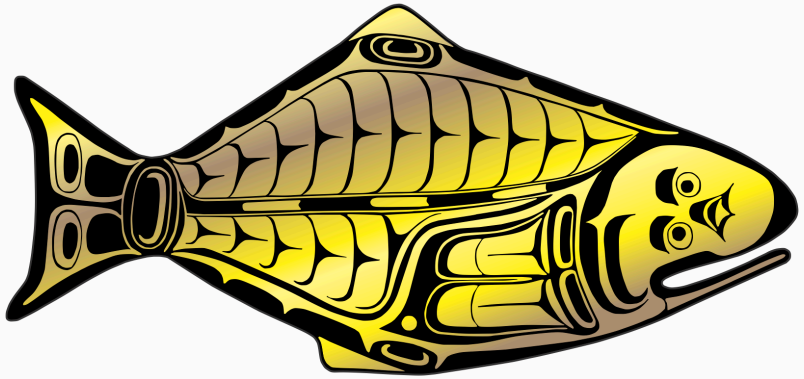

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