INTERNATIONAL PACIFIC HALIBUT COMMISSION

Preliminary assessment of sand flea prevalence in Pacific halibut commercial fisheries



Agenda item 5.2.1: Fishery-dependent data

IPHC-2026-RAB027-INF01

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Based on report by: W. Mixon, B. Hutniczak, A. Hicks, I. Stewart

Purpose

To address the request RAB026-Req.02 (para. 29):

- The RAB **REQUESTED** that the IPHC Secretariat set up efforts to increase documentation of sand flea occurrence during commercial fishing activities by encouraging fishing vessels to report such occurrences in logbooks, and to also relay this information to IPHC Fisheries Data Specialists (Field).

This presentation is adapted from work prepared during the summer of 2026 by intern William Mixon, who selected **the prevalence of sand flea infestation in Pacific halibut as his research project topic**. The work was supervised by B. Hutniczak, A. Hicks, and I. Stewart, and also benefited from discussions with IPHC Fisheries Data Specialists (Field), the FISS team (both HQ and Field), and C. Dykstra.



Background

Wildlife conflicts

- Bottom longline gear is vulnerable to depredation and scavenging
- The directed Pacific halibut fishery relies on this gear and is therefore especially exposed
- Data collection and an adaptive strategy are critical to minimising wildlife conflicts



Background - sand fleas

- Common benthic scavengers (amphipods)
- Damage lowers value or makes fish unmarketable
- Problem well known to fishermen but little studied

Fleet experience

- “Hot bottom” sites known to captains
- Avoid by setting shallower
- Never set overnight







Research objective

Respond to the RAB request by:

Evaluating available datasets

- Determine which questions the data can address
- Provide feedback on the fisherman-initiated data collection trial
- Propose future avenues for investigation

Mapping and modeling infestation (FISS)

- Where is infestation concentrated, and has this changed over time?
- How do set depth, soak time, and bottom temperature affect the probability of infestation?
- Do they affect its severity?

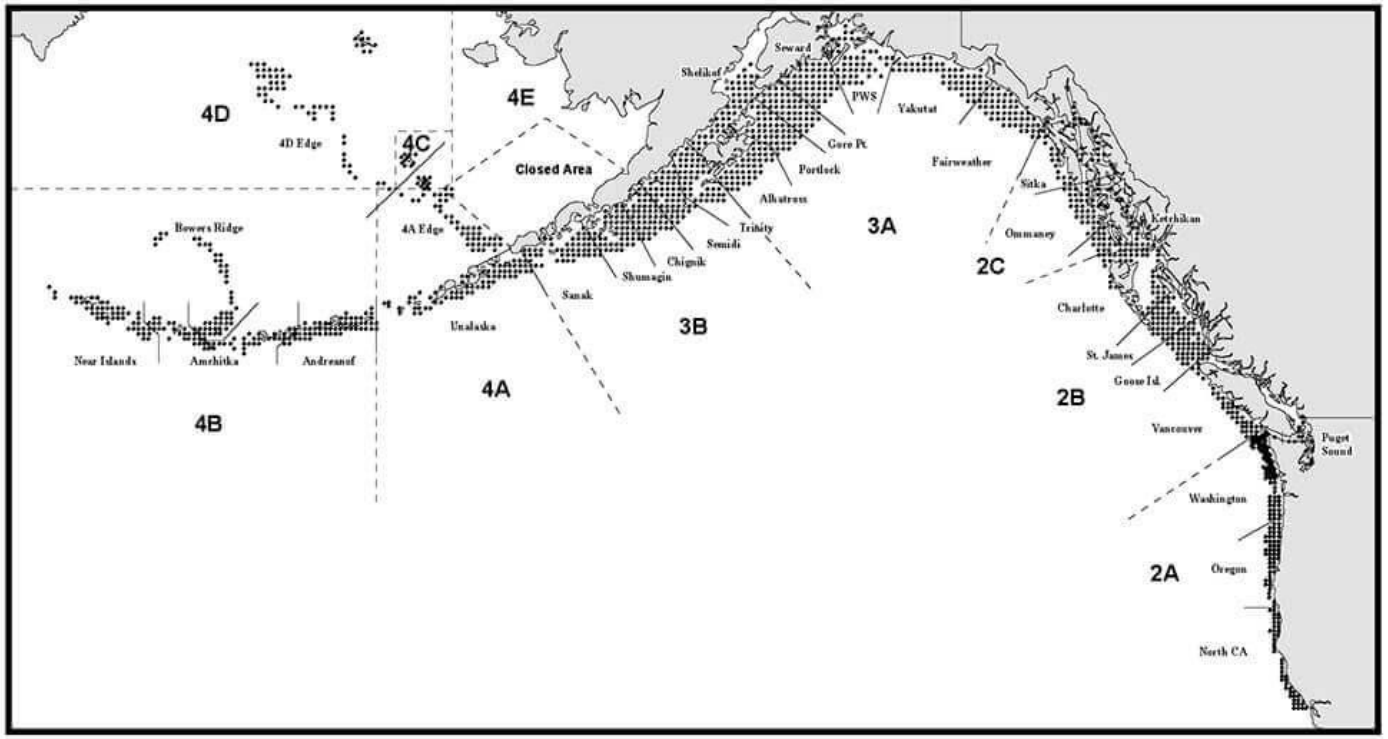


Methods - FISS

- Fishery-independent setline survey: standardized sets at fixed stations, run annually by the IPHC
- **Mapping:** the 2019 snapshot, plus 2000–2024 for the 5-year comparison (2025 dropped to keep periods even)
- **Modeling:** 2019–2025

Data include:

- Sand flea damage recorded for each fish
- Biological data (e.g. length, sex)
- Environmental data (e.g. bottom temperature)
- Station location, set depth, soak duration



Methods – commercial logbook data

<u>Began in 2026 with the fisherman-initiated data collection trial</u>

- Voluntary: captains may note sand flea damage alongside other damage records
- Recorded by captains in logbooks, or by IPHC Fisheries Data Specialists (Field) during interviews

Data include (per set)

- Number of Pacific halibut damaged by sand fleas
- Total number of Pacific halibut landed
- Set location, depth, and soak duration



Methods - modeling (FISS only)

Predictor variables

- Set depth
- Soak duration
- Bottom temperature

Response variables

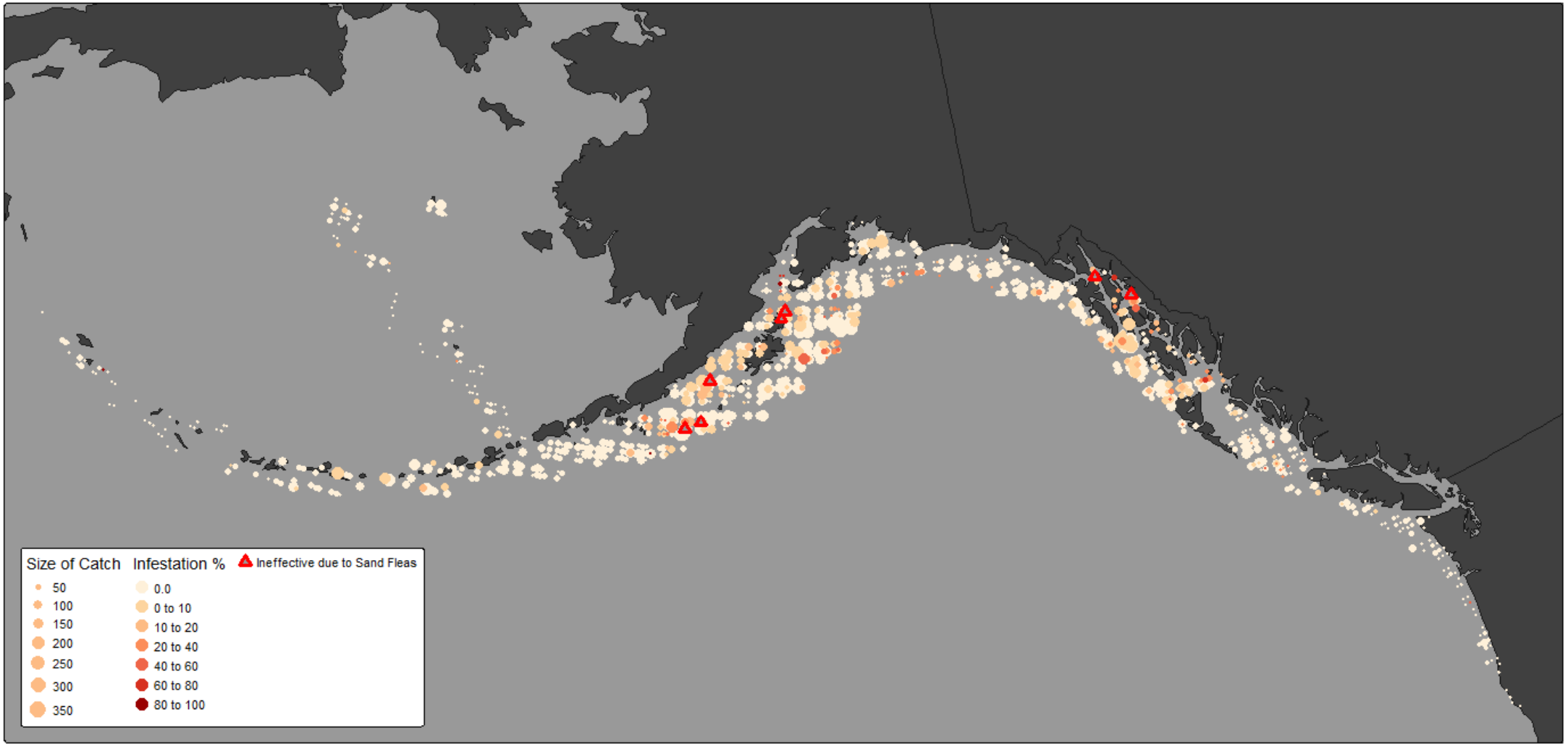
- Presence/absence (binary response)
- Infestation severity (proportion of catch damaged; infested sets only)

Generalized additive model (GAM)

- Captures non-linear relationships
- Binomial (presence/absence) and beta (severity) models
- Fit to 2019–2025 FISS data
- Model selection by AIC

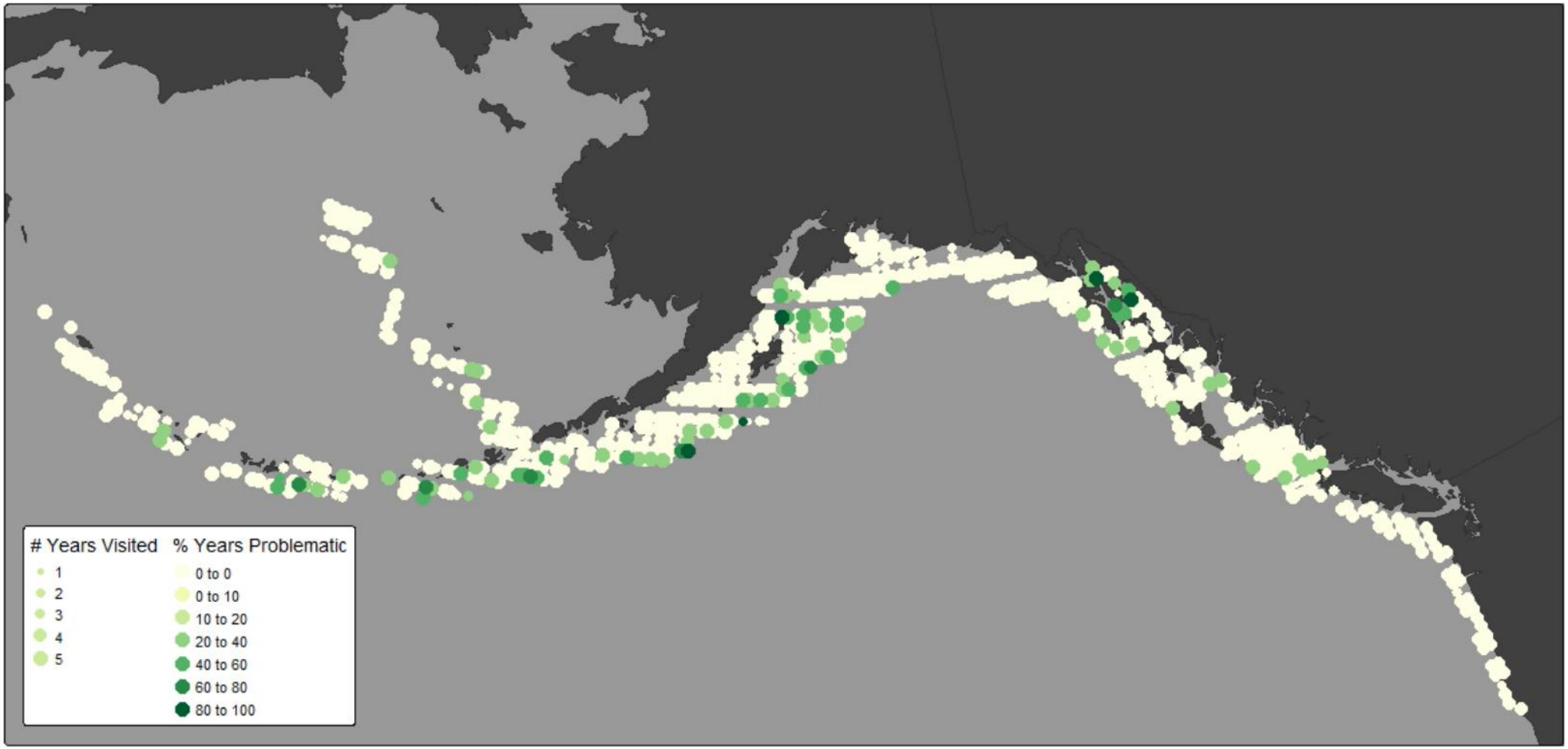
Results – FISS 2019 snapshot

FISS 2019 Sand Flea Prevalence



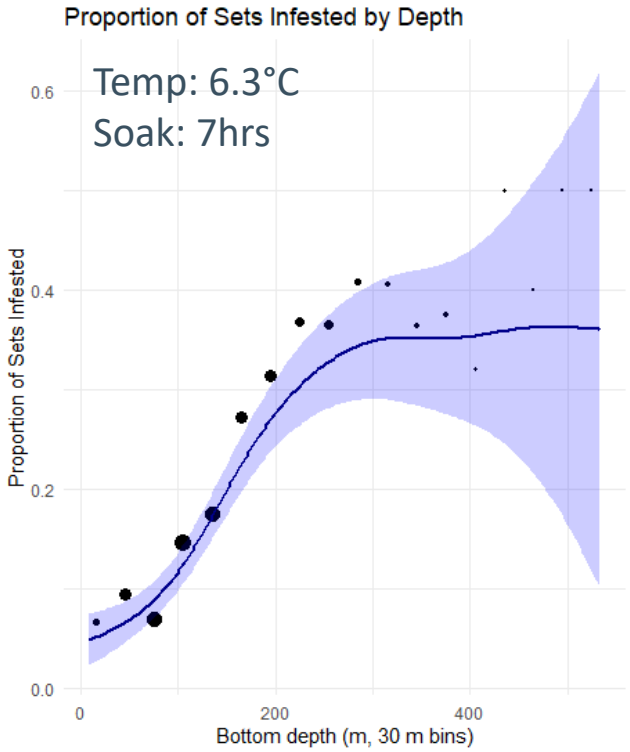
Results – FISS 5-year comparison

FISS 2000 - 2004 Sand Flea Prevalence

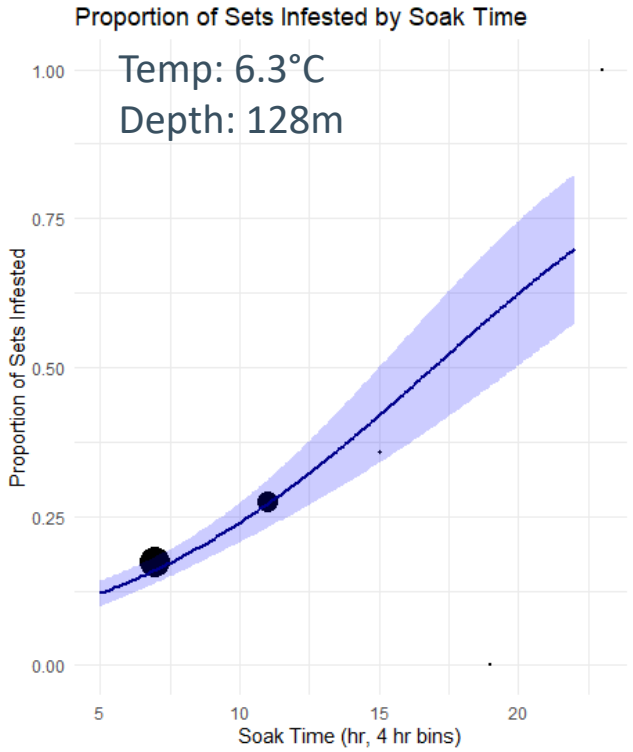


Problematic site definition: ≥7 damaged fish **and** ≥19% of catch (top 5% of sets).

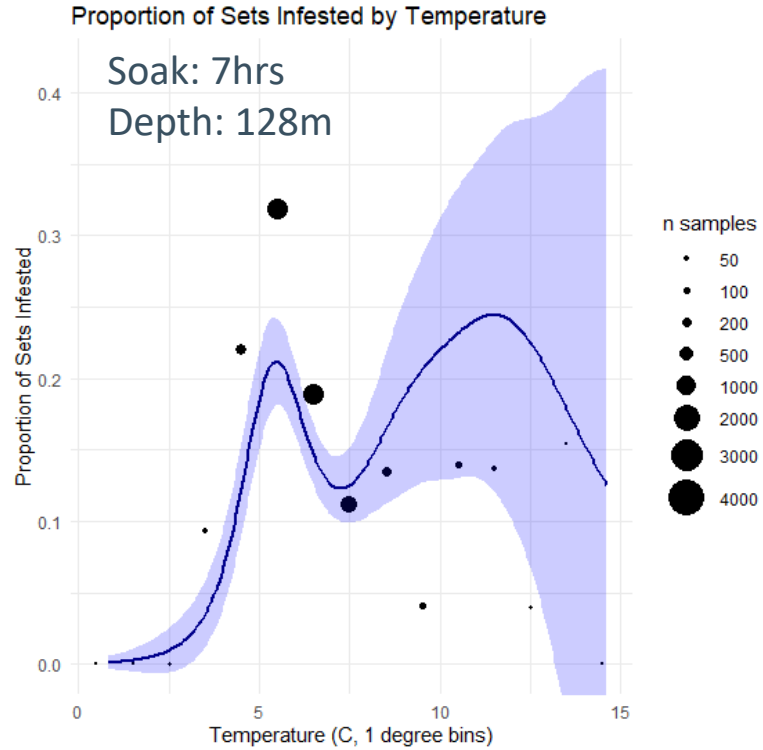
Results – probability of infestation



Deeper sets → higher infestation probability, leveling off at greater depths



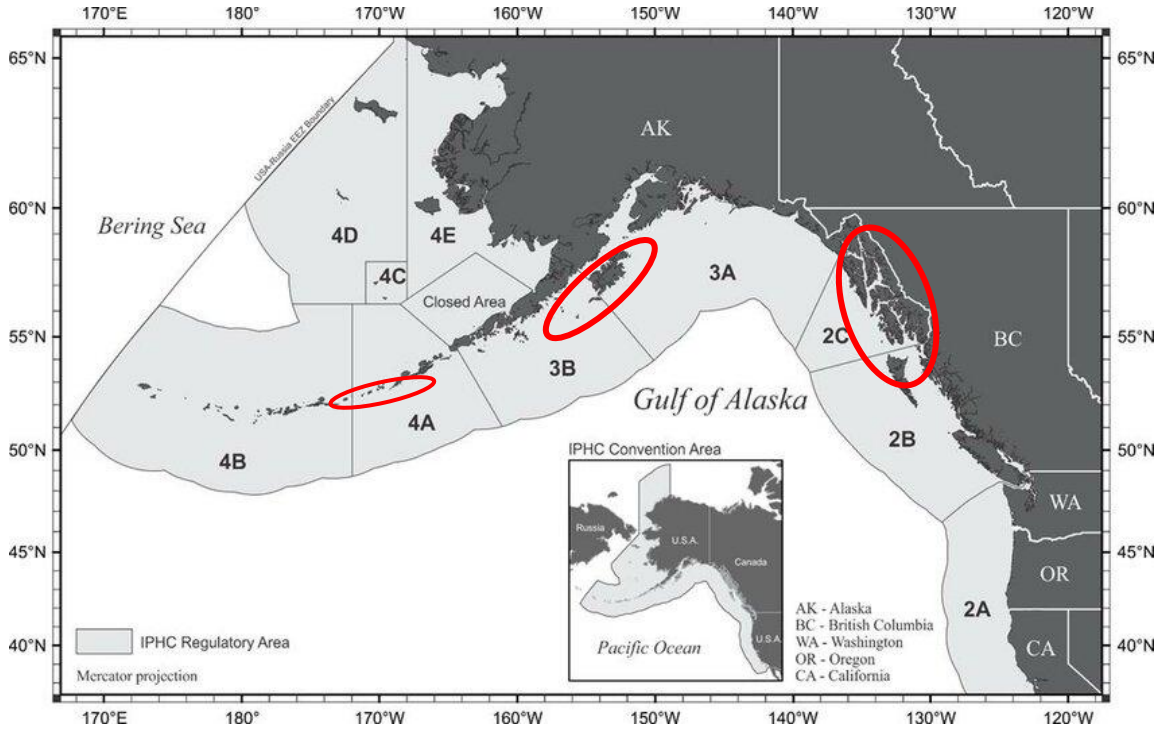
Longer soaks → steadily higher probability



Temperature: possible peak near 6 °C, but highly uncertain

Discussion – findings

- Sand flea prevalence is patchy
- High-activity areas persist across decades
- Depth and soak time relate to infestation probability, but weakly
  - Supports fleet tactics: shallower sets, shorter soak
- Possible temperature optimum near 6 °C (uncertain)
- No clear drivers of severity



High-prevalence areas:
Central Aleutians
Kodiak Island
Southeast Alaska (esp. Icy Strait)

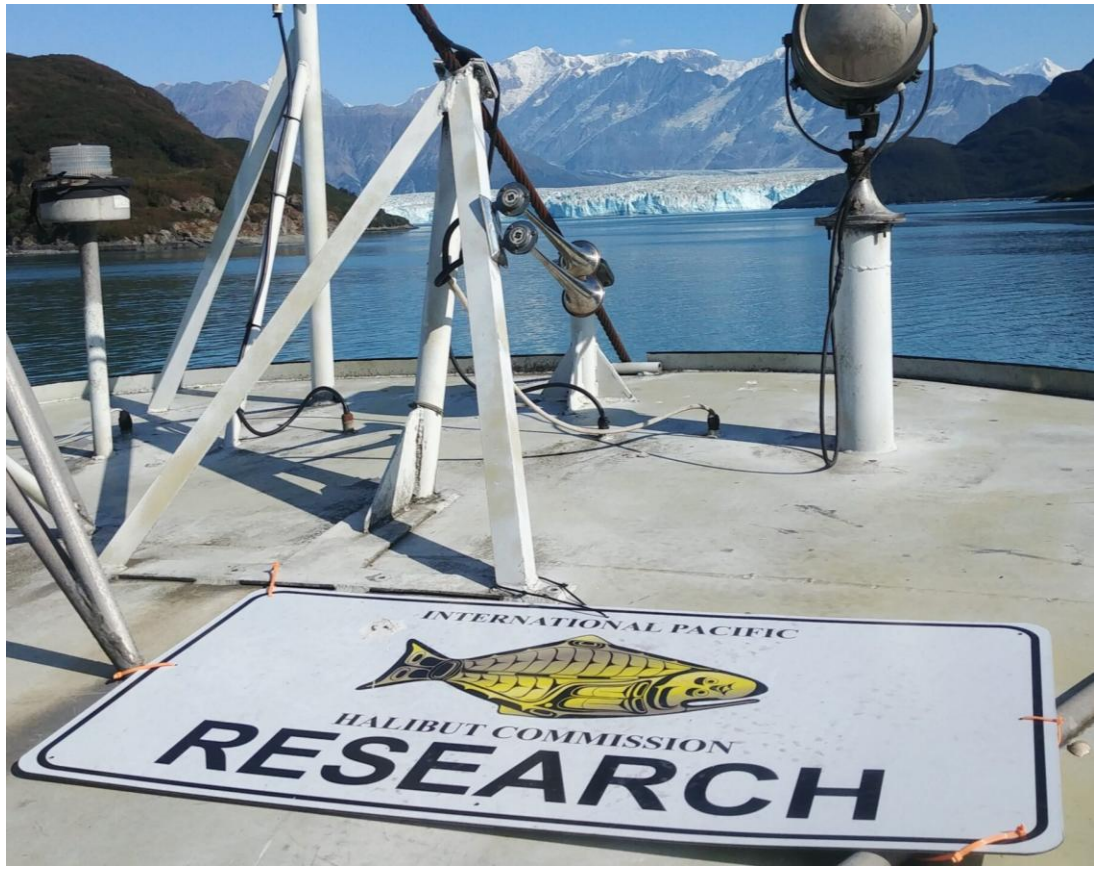
Discussion – FISS data

Strengths

- Decades of consistent, standardized data
- Sand flea damage recorded for every fish
- Easily expressed as rates by catch and effort

Limitations

- Daytime sets with standardized soaks, partly to avoid infestation
- Little information on long soaks or overnight sets
- Coarse spatial resolution (fixed station grid)
- Summer only; reduced footprint since 2020



Discussion – commercial logbook data

Strengths: fills gaps left by the FISS

- Includes long soaks and overnight sets
- Dense, fine-scale locations
- Year-round, not just summer

Limitations

- Limited first-year data; confidentiality constraints
- Reporting varies widely between captains (counts vs. estimates)
- Unclear whether “no damage” reflects a check for sand fleas
- Adds reporting burden for fishermen



Discussion – improving data collection

Commercial logbooks

- Ask about sand fleas directly, not only alongside other damage, so absence is recorded explicitly
- Clarify what to count (e.g., sublegal fish?) and when damage is recorded
- Consider simple categories: none / present, no damage / damage reducing market value
- Engage with the RAB to refine the protocol



Complementary signal

- 2026 Fisher Sentiment Survey includes “poor quality fish (e.g., small, infested)” – a broad pulse of fleet concerns over time
- IPHC encourages participation in both efforts

Conclusions

The fishermen are on to something!

- Avoidance tactics (shallower sets, shorter soaks) are partly supported by data

Continue and improve data collection

- Clearer logbook reporting, including absence, is the key next step
- Identify higher-risk areas to reduce lost quota and market value
- RAB input would help design the next steps (reporting protocol, priority questions)

Better mortality estimates

- Documenting infestations supports stock assessment





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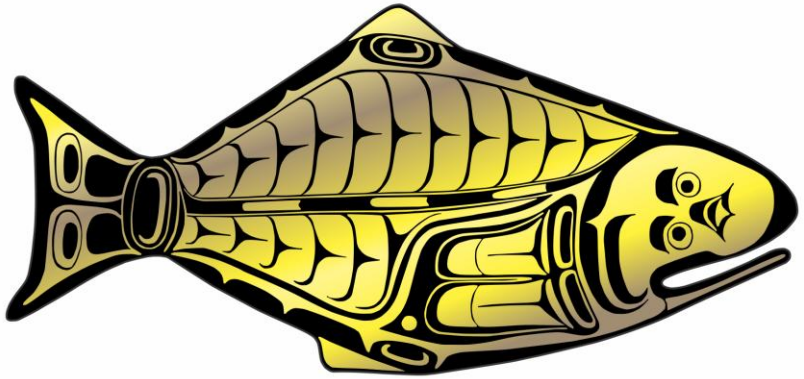

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