IPHC Fishery-Independent Setline Survey (FISS) design and implementation in 2020

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PURPOSE

To provide the RAB with a summary of the proposal for a rationalised FISS design in 2020.

BACKGROUND/INTRODUCTION

2020 will be the first year of a fully re-designed FISS following completion of a series of FISS expansions, beginning with a 2011 pilot in IPHC Regulatory Area 2A, and continuing from 2014-19 covering all IPHC Regulatory Areas. This expansion program succeeded in filling large gaps in the FISS coverage, providing us with a complete FISS design based around the 10 nmi grid that will be used for annual FISS station selection in subsequent years.

The 2020 FISS design

The primary purpose of the annual FISS is to sample Pacific halibut to provide data for the stock assessment and estimates of stock distribution. The priority of a rationalised FISS is therefore 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 other agencies, and IPHC policies (tertiary design layer). These priorities are outlined in Table 1.

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: • Station distribution • Station count • 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 Assist: assist others to collect data on a cost-recovery basis IPHC policies: ad-hoc decisions of the Commission regarding the FISS design

The historical sampling, combined with FISS expansions from 2014-2019, established a full FISS design of 1890 stations from California to the Bering Sea shelf edge on a 10 nmi grid from depths of 10 – 400 fm (Figure 1). Future annual FISS designs[1] will comprise a selection of stations from this full design, with all stations in the design to be sampled over subsequent years.

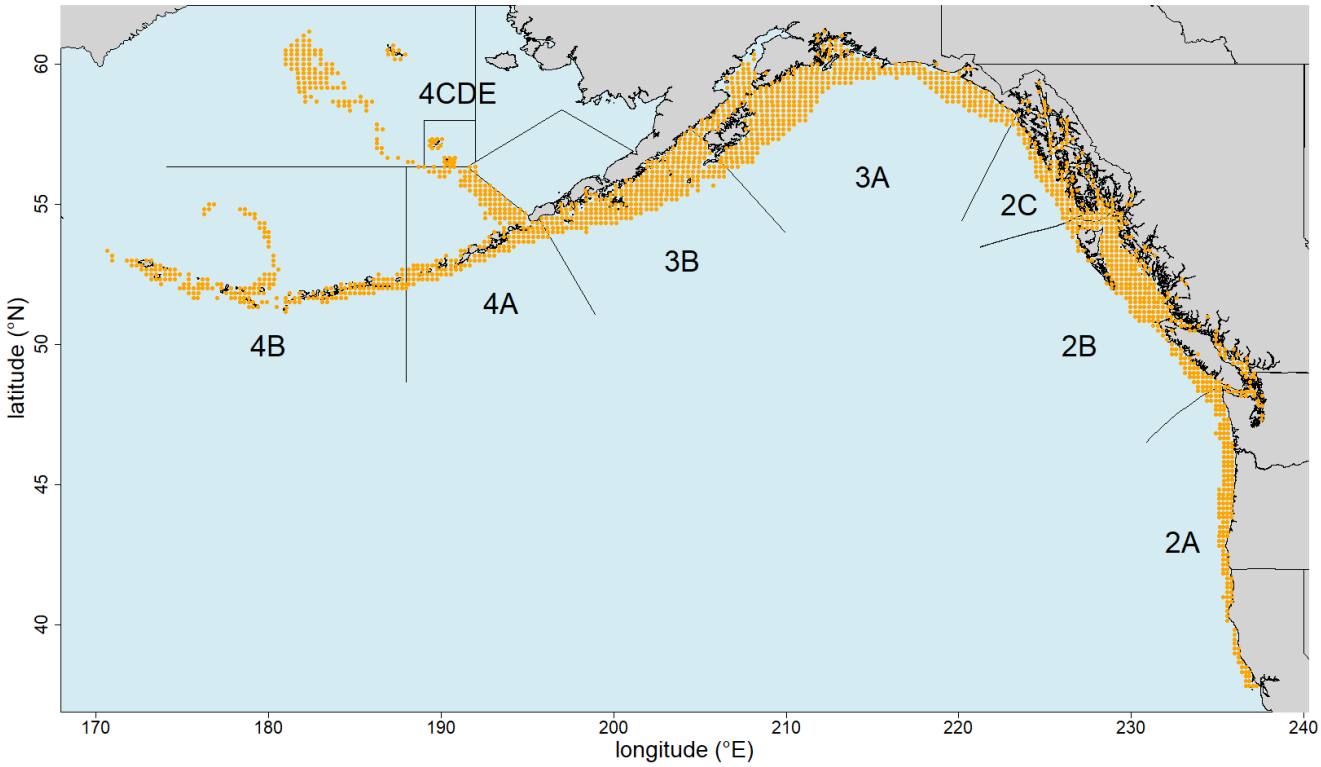

Figure 1. Map of the full FISS design to be used for station selection from 2020 onwards. Each orange circle represents a FISS station.

For 2020, the IPHC Secretariat staff's preferred design proposal represents a compromise between meeting the Primary FISS scientific priority and the Secondary logistics/cost priority (Figure 2). In the core of the stock, Regulatory Areas of 2B, 2C, 3A and 3B, a random sample of stations was selected, ensuring no bias and with sample sizes sufficient to meet FISS precision targets. In Regulatory Areas 2A, 4A and 4B, where the majority of the biomass is concentrated locally, the proposal samples only the highest-density subareas in 2020. Sampling in other parts of these Regulatory Areas will be undertaken in subsequent years at a frequency that maintains low bias in estimates obtained from the FISS data. The proposal includes fishing the full 10 nmi grid along the Regulatory Area 4CDE edge in 2020-22 (last fished in 2016. Ecosystem conditions have been anomalous in the Bering Sea for several years, making the Pacific halibut distribution more difficult to predict in unsurveyed habitat. The IPHC is interested in better understanding density trends and possible links with Pacific halibut in Russian waters

[1] Analysis of the FISS results also includes data not collected by the IPHC: NMFS and ADFG trawl surveys provide annual-triennial information from the eastern Bering Sea, northern Bering Sea and Norton Sound, reducing the need for direct FISS sampling in these areas.

in the Bering Sea, and the data obtained from sampling the full FISS grid in that area would help greatly in achieving these goals.

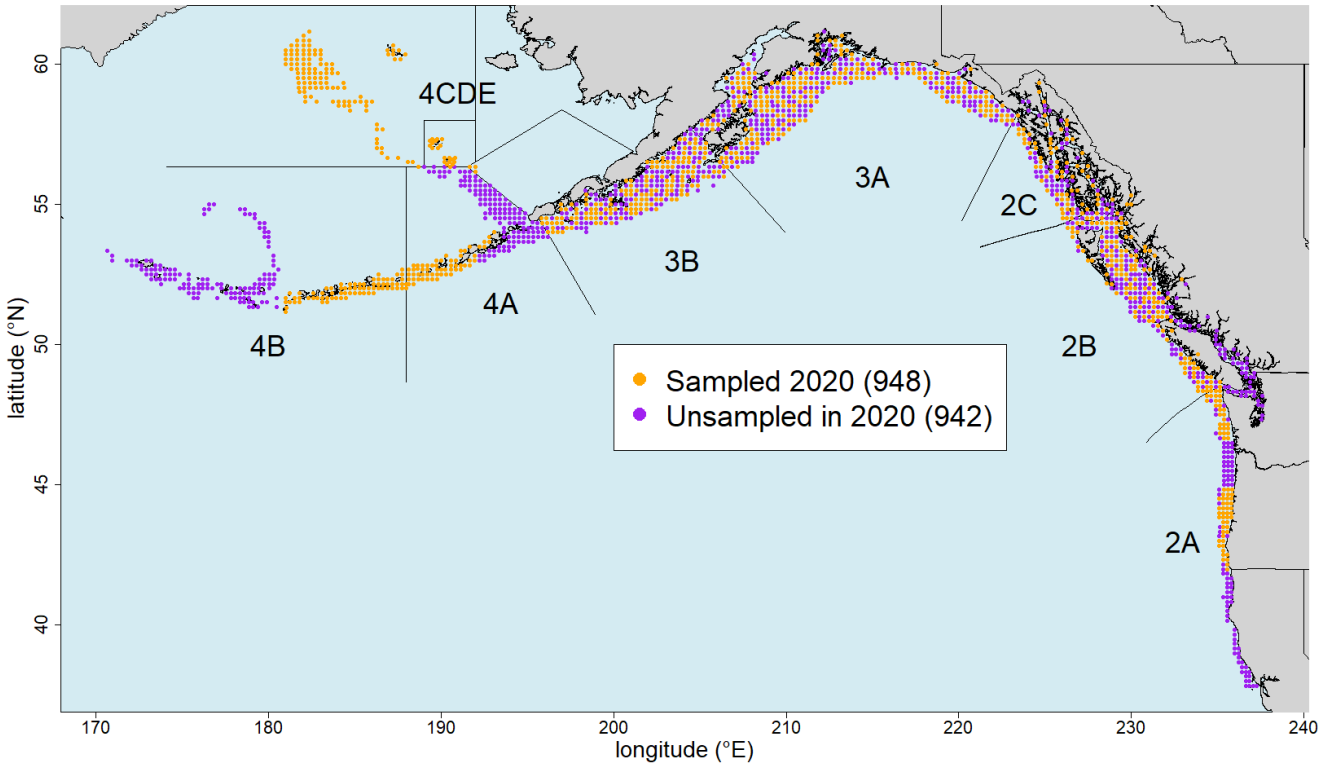

Figure 2. Proposed minimum FISS design in 2020 (orange circles) based on randomized sampling in 2B-3B, and a subarea design elsewhere. Purple circles are optional for meeting data quality criteria.

Continued snap and fixed gear comparison

The comparison of catch rates by snap and fixed gear conducted in Regulatory Area 2C in 2019 was successful, and included in the modeled results. For 2020, another comparison will be made in western Regulatory Area 4A (Figure 3) in order to: 1) reduce uncertainty in the relative catch rates, 2) compare results under different habitat conditions and size structure of the Pacific halibut population, and 3) provide additional sampling opportunity in an area with relatively high marine mammal interactions. Future comparisons may be needed before snap gear can be included as a standard gear type in the annual survey design.

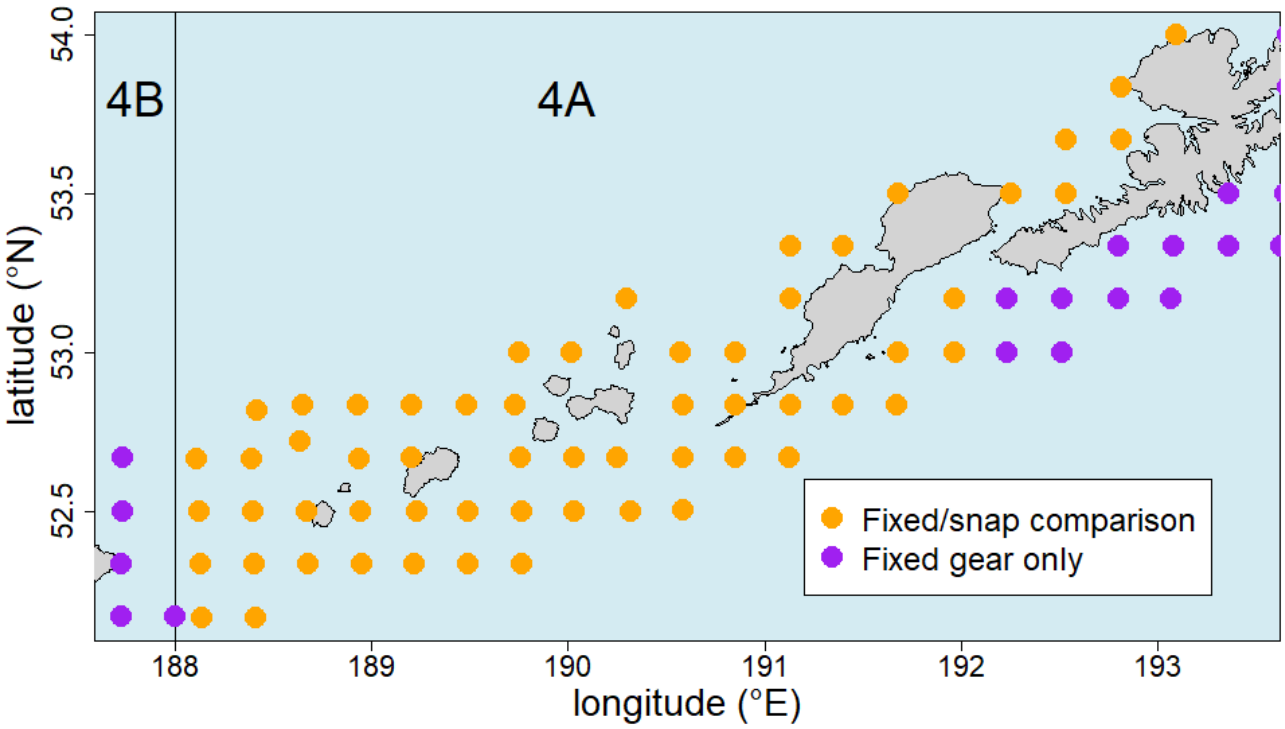

Figure 3. Proposed fixed/snap gear comparison stations in 2020 (orange circles).

RECOMMENDATION

1) That the RAB **NOTE** paper IPHC-2020-RAB021-06 which provided an overview of the International Pacific Halibut Commission's (IPHC) fishery-independent setline survey (FISS) design and implementation for 2020.