



IPHC Fishery-Independent Setline Survey (FISS) design and implementation in 2023

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PURPOSE

To provide a summary of the IPHC Fishery-Independent Setline Survey (FISS) design and implementation in 2023.

BACKGROUND

The annual IPHC Fishery-Independent Setline Survey (FISS) of the Pacific halibut stock was augmented from 2014-2019 with expansion stations that filled in gaps in coverage in the annual FISS. Prior to 2020, the standard grid of stations comprised 1,200 stations. Following the completion in 2019, expansion stations were added to the standard grid in all IPHC Regulatory Areas, now totaling 1,890 stations for the full FISS design (Figure 1), within the prescribed depth range of 18 to 732 metres (10 to 400 fathoms).

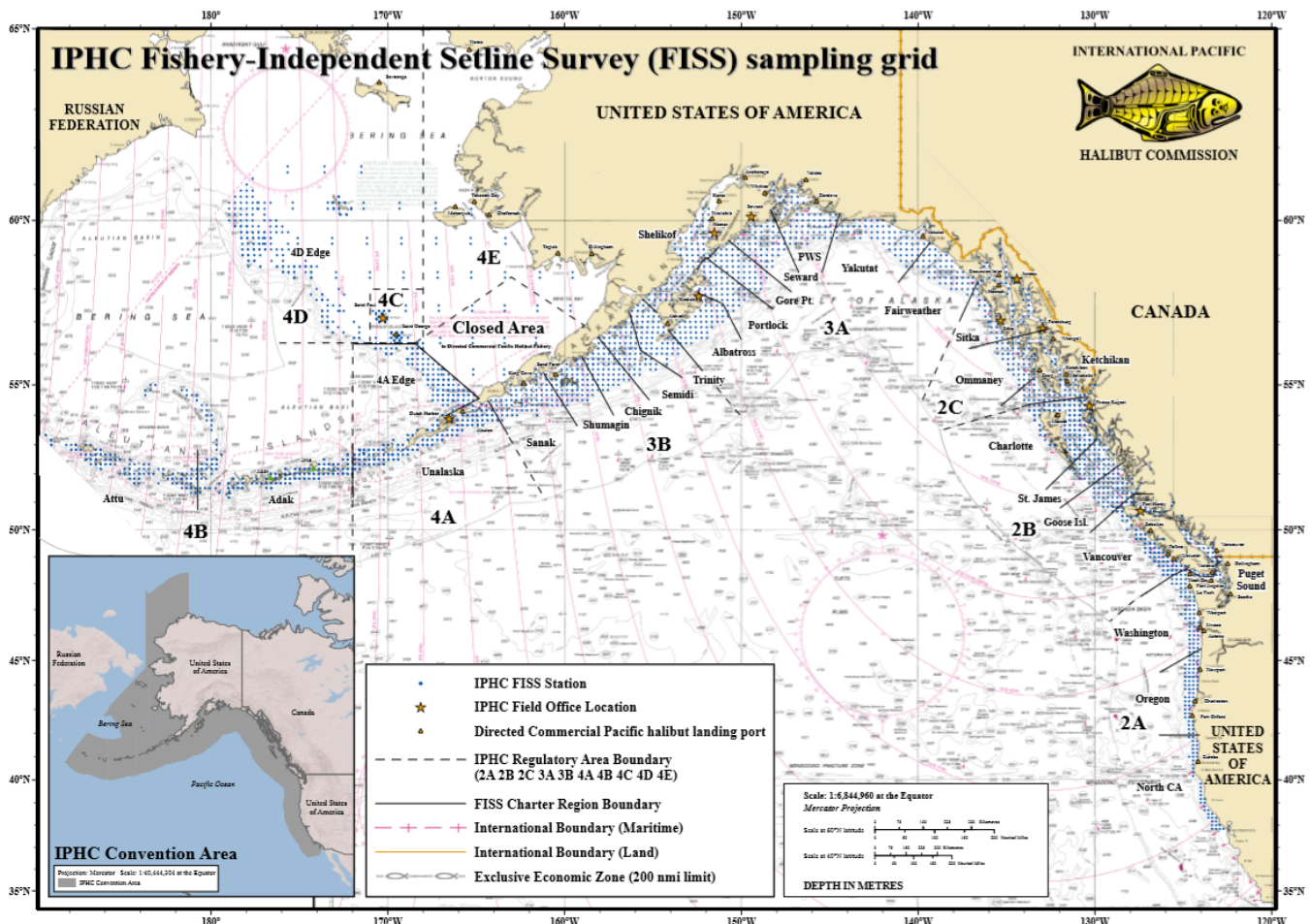


Figure 1. IPHC Fishery-Independent Setline Survey (FISS) with full sampling grid shown.

Prior to 2019, only fixed gear was used to fish FISS sets. With increasing use of snap gear in the commercial fishery, this restriction has limited the number of vessels available for the FISS. Further, any differences between snap and fixed gears (including catch rate differences and differences in fishing locations) may affect our understanding of trends in commercial fishery indices. This has motivated the need for a study comparing the two gear types with this work being done in 2019, 2020,

and again in 2021. While no study was completed in 2022, we recognized the increased use of snap gear and integrated snap gear into the FISS tender specifications for 2023.

Beginning in 2019, individual weight data were collected coastwide from Pacific halibut caught on the FISS to eliminate questions that have arisen regarding the accuracy of estimates that depend on these weights, including weight per unit effort (WPUE) indices of density. Data from IPHC collections from commercial landings and other sources had provided evidence that the current standard length-net weight curve used for estimating Pacific halibut weights on the FISS may have been over-estimating weights on average in most IPHC Regulatory Areas, and that the relationship between weight and length may vary spatially.

2023 FISS design

At the 98th Session of the IPHC Interim Meeting (IM098), the Commission endorsed a FISS design for 2023 that included 958 stations coastwide (Fig. 2). The design comprised sampling of subareas within IPHC Regulatory Areas 2A, 2B, 3A, 3B, 4A, and 4B intended to balance the Commission’s primary and secondary objectives for the FISS. 2023 sampling in IPHC Regulatory Areas 2C included 100% of the full FISS design.

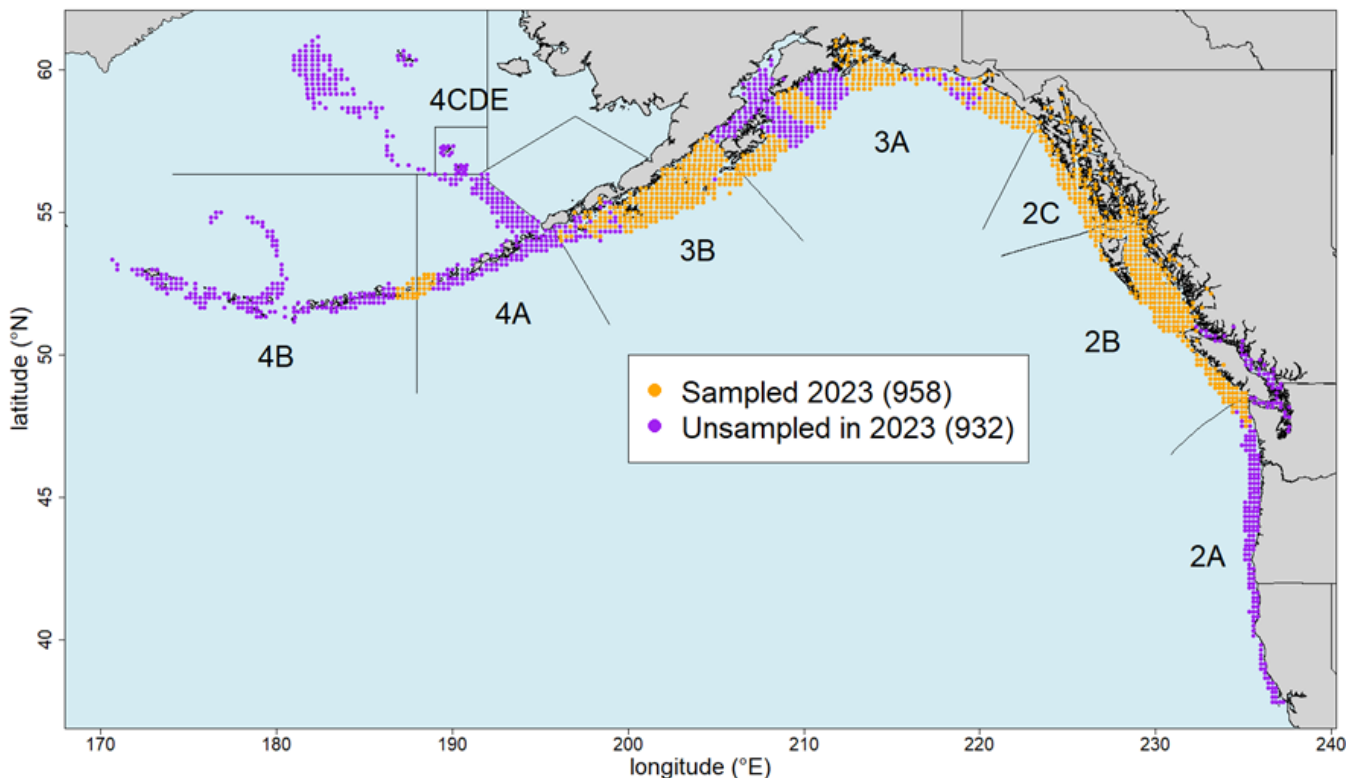


Figure 2. Map of the 2023 FISS design endorsed by the Commission on 1 December 2022 ([IPHC-2022-IM098](#)). Purple circles were not sampled in 2023.

At the 99th Session of the IPHC Annual Meeting ([IPHC-2023-AM099-R](#)), the Commission:

(para. 30) “**NOTED** paper [IPHC-2023-AM099-10](#) which provided the designs for the IPHC’s Fishery-Independent Setline Survey (FISS) for the 2023-25 period, as reviewed by the Scientific Review Board (SRB) in 2022, and endorsed at IM098: [IPHC-2022-IM098-R](#), para. 31: “The Commission **ENDORSED** an optimized design for the 2023 FISS as provided at Appendix IV, that balances the Commission’s primary and secondary objectives for the FISS. As with all years, the Commission will have an additional opportunity to modify the 2023 FISS design at AM099.”

MATERIALS AND METHODS

The IPHC's FISS design encompasses nearshore and offshore waters of the IPHC Convention Area (Fig. 1). The IPHC Regulatory Areas are divided into 29 charter regions, each requiring between 10 and 46 charter days to complete. FISS stations are located at the intersections of a 10 nmi by 10 nmi square grid within the depth range occupied by Pacific halibut during summer months (18 – 732 m [10 – 400 fm]). Figure 2 depicts the 2023 FISS station positions, and IPHC Regulatory Areas.

Fishing vessels are chosen through a competitive bid process where up to four (4) charter regions per vessel may be awarded and typically 10-15 vessels are chosen. In 2023, the process has been clearly documented on the IPHC website for accountability and transparency purposes: <https://www.iphc.int/management/science-and-research/fishery-independent-setline-survey-fiss/62-fiss-vessel-recruiting>.

In 2023, 8 vessels were chartered to complete the FISS, as detailed in [Media Release 2023-008: Notification of IPHC Fishery-Independent Setline Survey \(FISS\) 2023 Contract Awards](#).

Sampling protocols

IPHC Setline Survey Specialists (Field) collected data according to protocols established in the 2023 FISS Sampling Manual ([IPHC-2023-VSM01](#)).

Sampling challenges - 2023

Of the 958 FISS stations planned for the 2023 FISS season, 865 (90%) were effectively sampled.

Not sampled: A total of 66 initially planned stations were not sampled in 2022. There were challenges with vessel recruitment this season due to 1) increased sablefish quota availability; 2) vessels unable to meet FISS tender specifications regarding deck space, communication capabilities, safety equipment, etc.; and 3) challenges with vessel crew recruitment.

Due to the challenges with vessel recruitment, the following stations within IPHC charter regions were not sampled: Yakutat (36 stations), Unalaska (15 stations) and Adak (15 stations).

In addition, two (2) stations in Sitka were unsampled as they were within Glacier Bay National Park and we were not permitted to complete these stations within the park this year by NOAA.

Ineffective stations: Coastwide, thirty-three (33) stations were deemed ineffective due to Orca depredation (n=3), Sperm whale depredation (n=16), gear soak time (n=2), shark predation (n=3), pinniped predation (n=1), station moved > 3nmi (n=1), and setting and gear issues (n=7).



Bait (*Chum salmon*)

The minimum quality requirement for FISS bait is No. 2 semi-bright (Alaska Seafood Marketing Institute grades A through E), headed and gutted, and individually quick-frozen chum salmon. Bait usage is based on 0.17 kilograms (0.37 pounds) per hook resulting in approximately 136 kilograms (300 pounds) per eight skate station. Bait quality was monitored and documented throughout the season and found to meet the standard as described above.

Pre-season: In August 2022 ([IPHC Media Release 2022-015](#)), the Secretariat made pre-season bait purchases of approximately 105 tonnes (210,000 lbs) to ensure a smooth start to the 2023 FISS.

In-season: Throughout the FISS season, the Secretariat secured an additional 14,400 lb of bait, to supplement pre-season purchases and complete the 2023 FISS successfully.

RESULTS

Interactive views of the FISS results are provided via the IPHC website and can be found here once published:

<https://www.iphc.int/data/setline-survey-catch-per-unit-effort>

As in previous years, legal-sized (O32) Pacific halibut that were caught on FISS stations and sacrificed in order to obtain biological data were retained and sold. In addition, beginning in 2020, sub-legal (U32) Pacific halibut that were caught and randomly selected for otolith sampling were also retained and sold. This helps to offset costs of the FISS. FISS vessels also retained for sale incidentally captured rockfish (*Sebastes spp.*) and Pacific cod (*Gadus macrocephalus*). These species were retained because they rarely survive the barotrauma resulting from capture. Most vessel contracts provided the vessel a lump sum payment, along with a 10% share of the Pacific halibut proceeds and a 50% share of the incidental catch proceeds.

The 2023 FISS chartered 8 commercial longline vessels (four Canadian and four USA) during a combined 48 trips and 497 charter days ([Tables 1](#)). Otoliths were removed from 8,506 fish coastwide. Approximately 232 tonnes (512,491 pounds) of Pacific halibut, 38 tonnes (83,839 pounds) of Pacific cod, and 39 tonnes (86,871 pounds) of rockfish were landed from the FISS stations.

Table 1a. Effort and landing summary by FISS charter region and vessel for all 2023 stations and all Pacific halibut (sampled U32 and all O32).

IPHC Regulatory Area	Charter Region	Vessel	Vessel Number ¹	Charter Days ²	Planned Stations	Effective Stations ³	Pacific halibut Sold (t) ⁴	Pacific halibut Sold (lb) ⁴	Average Price USD/kg ⁵	Average Price USD/lb ⁵
2A	Washington	<i>Pacific Surveyor</i>	947061	12	24	24	5	11666	\$10.60	\$4.81
2B	Charlotte	<i>Pender Isle</i>	27282	42	89	87	25	55957	\$17.42	\$7.90
2B	Goose Island	<i>Star Wars II</i>	175688	32	57	48	10	21226	\$17.25	\$7.83
2B	St. James	<i>Star Wars II</i>	175688	33	60	57	14	31242	\$16.78	\$7.61

2B	Vancouver Outside	<i>Vanisle</i>	80000	33	57	56	9	19364	\$17.62	\$7.99
2C	Ketchikan	<i>Vanisle</i>	80000	26	43	42	16	35003	\$14.99	\$6.80
2C	Ommaney	<i>Bold Pursuit</i>	383527	30	52	49	36	78373	\$12.66	\$5.74
2C	Sitka	<i>Star Wars II</i>	175688	30	52	49	18	39018	\$13.36	\$6.06
3A	Albatross	<i>Kema Sue Bold</i>	41033	25	49	48	12	26181	\$11.09	\$5.03
3A	Fairweather	<i>Pursuit</i>	383527	25	51	51	5	10975	\$12.93	\$5.87
3A	Gore Point	<i>Dangerous Cape</i>	77199	27	48	48	7	16306	\$14.27	\$6.47
3A	Prince William Sound	<i>Dangerous Cape</i>	77199	39	67	64	9	20495	\$11.27	\$5.11
3B	Chignik	<i>Kema Sue</i>	41033	23	48	46	10	21813	\$9.93	\$4.51
3B	Sanak	<i>Kema Sue</i>	41033	20	36	35	9	20468	\$0.34	\$4.52
3B	Semidi	<i>Devotion</i>	42892	34	56	56	16	35323	\$10.64	\$4.82
3B	Shumagin	<i>Kema Sue</i>	41033	32	54	53	16	34185	\$11.04	\$5.01
3B	Trinity	<i>Devotion</i>	42892	34	56	52	16	34896	\$10.99	\$4.98
Total		8 Vessels		497	899	865	232	512,491	\$13.31	\$6.04

1 Canada: Vessel Registration Number and USA: ADF&G vessel number.

2 Days are estimated - some vessels fished two charter regions in one day.

3 Stations that did not meet setting parameters or deemed ineffective are excluded.

4 Net weight (head-off, dressed, washed). May not sum to correct total due to rounding.

5 Ex-vessel price.

Table 1b. Effort and landing summary by FISS charter region and vessel for all 2023 stations and O32 Pacific halibut.

IPHC Regulatory Area	Charter Region	Vessel	Vessel Number ¹	Charter Days ²	Planned Stations	Effective Stations ³	Pacific halibut Sold (t) ⁴	Pacific halibut Sold (lb) ⁴	Average Price USD/kg ⁵	Average Price USD/lb ⁵
2A	Washington	<i>Pacific Surveyor</i>	947061	12	24	24	4	8,421	\$11.54	\$5.23
2B	Charlotte	<i>Pender Isle</i>	27282	42	89	87	25	54,521	\$17.48	\$7.93
2B	Goose Island	<i>Star Wars II</i>	175688	32	57	48	9	20,464	\$17.34	\$7.86
2B	St. James	<i>Star Wars II</i>	175688	33	60	57	14	30,430	\$16.83	\$7.63
2B	Vancouver	<i>Vanisle</i>	80000	33	57	56	0	0	\$17.67	\$8.01
2C	Ketchikan	<i>Vanisle</i>	80000	26	43	42	16	34,396	\$15.01	\$6.81
2C	Ommaney	<i>Bold Pursuit Star</i>	383527	30	52	49	35	78,075	\$12.67	\$5.75
2C	Sitka	<i>Star Wars II</i>	175688	30	52	49	17	38,367	\$13.38	\$6.07
3A	Albatross	<i>Kema Sue</i>	41033	25	49	48	11	25,183	\$11.13	\$5.05
3A	Fairweather	<i>Bold Pursuit</i>	383527	25	51	51	5	10,555	\$12.97	\$5.88
3A	Gore Point	<i>Dangerous Cape</i>	77199	27	48	48	7	15,255	\$14.36	\$6.51
3A	Prince William Sound	<i>Dangerous Cape</i>	77199	39	67	64	8	18,674	\$11.43	\$5.19

3B	Chignik	<i>Kema Sue</i>	41033	23	48	46	9	19,332	\$10.03	\$4.55
3B	Sanak	<i>Kema Sue</i>	41033	20	36	35	9	20,059	\$9.99	\$4.53
3B	Semidi	<i>Devotion</i>	42892	34	56	56	16	34,798	\$10.67	\$4.84
3B	Shumagin	<i>Kema Sue</i>	41033	32	54	53	15	33,046	\$11.07	\$5.02
3B	Trinity	<i>Devotion</i>	42892	34	56	52	15	33,211	\$11.05	\$5.01
Total		8 Vessels		497	899	865	215	474,787	\$13.40	\$6.08

1 Canada: Vessel Registration Number and USA: ADF&G vessel number.

2 Days are estimated - some vessels fished two charter regions in one day.

3 Stations that did not meet setting parameters or deemed ineffective are excluded.

4 Net weight (head-off, dressed, washed). May not sum to correct total due to rounding.

5 Ex-vessel price.

Table 1c. Effort and landing summary by FISS charter region and vessel for all 2023 stations and sampled U32 Pacific halibut.

IPHC Regulatory Area	Charter Region	Vessel	Vessel Number ¹	Charter Days ²	Planned Stations	Effective Stations ³	Pacific halibut Sold (t) ⁴	Pacific halibut Sold (lb) ⁴	Average Price USD/kg ⁵	Average Price USD/lb ⁵
2A	Washington	<i>Pacific Surveyor</i>	947061	12	24	24	1	3,245	\$8.18	\$3.71
2B	Charlotte	<i>Pender Isle</i>	27282	42	89	87	1	1,436	\$15.41	\$6.99
2B	Goose Island	<i>Star Wars II</i>	175688	32	57	48	0	762	\$14.96	\$6.78
2B	St. James	<i>Star Wars II</i>	175688	33	60	57	0	812	\$14.69	\$6.66
2B	Vancouver	<i>Vanisle</i>	80000	33	57	56	0	536	\$15.90	\$7.21
2C	Ketchikan	<i>Vanisle</i>	80000	26	43	42	0	607	\$13.76	\$6.24
2C	Ommaney	<i>Bold Pursuit</i>	383527	30	52	49	0	298	\$10.67	\$4.84
2C	Sitka	<i>Star Wars II</i>	175688	30	52	49	0	651	\$11.93	\$5.41
3A	Albatross	<i>Kema Sue</i>	41033	25	49	48	0	998	\$9.92	\$4.50
3A	Fairweather	<i>Bold Pursuit</i>	383527	25	51	51	0	420	\$11.96	\$5.42
3A	Gore Point	<i>Dangerous Cape</i>	77199	27	51	48	0	1,051	\$12.89	\$5.85
3A	Prince William Sound	<i>Dangerous Cape</i>	77199	39	51	64	1	1,821	\$9.60	\$4.35
3B	Chignik	<i>Kema Sue</i>	41033	23	51	46	1	2,481	\$9.19	\$4.17
3B	Sanak	<i>Kema Sue</i>	41033	20	51	35	0	409	\$8.82	\$4.00
3B	Semidi	<i>Devotion</i>	42892	34	51	56	0	525	\$8.19	\$3.72
3B	Shumagin	<i>Kema Sue</i>	41033	32	51	53	1	1,139	\$10.17	\$4.61
3B	Trinity	<i>Devotion</i>	42892	34	51	52	1	1,685	\$9.83	\$4.46
Total		8 Vessels		497	899	865	9	18,876	\$10.84	\$4.92

1 Canada: Vessel Registration Number and USA: ADF&G vessel number.

2 Days are estimated - some vessels fished two charter regions in one day.

3 Stations that did not meet setting parameters or deemed ineffective are excluded.

4 Net weight (head-off, dressed, washed). May not sum to correct total due to rounding.

5 Ex-vessel price.

Vessels chartered by the IPHC delivered fish to 15 different ports (Tables 2). Fish sales were awarded based on obtaining a fair market price. When awarding sales, the Commission considered the price offered, the number of years that a buyer had been buying and marketing Pacific halibut, how fish were graded at the dock (including the determination of No. 2 and chalky Pacific halibut), and the promptness of settlements following deliveries. Individual sales were evaluated after each event to ensure that the buyer was meeting IPHC standards. Average prices decreased from \$17.01/kg in 2022 to \$13.31/kg in 2023 (Tables 3). This represents a 21.8% decrease in price.

Table 2a. FISS Pacific halibut landings by port for all Pacific halibut (sampled U32 and all O32), 2023^{1,2}.

Offload Port	Trips	Tonnes	Pounds	Total USD	Average Price (USD/kg)	Average Price (USD/lb)
Cordova	1	4	7,788	\$37,885.00	\$10.72	\$4.86
Homer	1	4	7,967	\$53,388.00	\$14.77	\$6.70
Juneau	2	6	14,173	\$84,372.30	\$13.12	\$5.95
Ketchikan	2	6	13,043	\$78,128.40	\$13.21	\$5.99
King Cove	1	9	20,647	\$106,332.05	\$11.35	\$5.15
Kodiak	7	40	88,220	\$439,456.00	\$10.98	\$4.98
Port Angeles	1	2	5,418	\$23,073.50	\$9.39	\$4.26
Port Hardy	9	38	84,369	\$643,706.63	\$16.82	\$7.63
Prince Rupert	9	39	85,936	\$658,515.90	\$16.89	\$7.66
Sand Point	5	29	63,999	\$292,250.37	\$10.07	\$4.57
Seward	4	10	21,046	\$118,998.80	\$12.47	\$5.65
Sitka	4	39	86,885	\$478,175.71	\$12.13	\$5.50
Vancouver	1	1	3,228	\$26,732.59	\$18.26	\$8.28
Westport	1	3	6,248	\$33,028.51	\$11.65	\$5.29
Yakutat	1	2	3,524	\$19,965.75	\$12.49	\$5.67
Grand Total	49	232	512,491	\$3,094,009.51	\$13.31	\$6.04

¹ Net weight (head-off, dressed, washed).

² Prices based on net weight.

Table 2b. FISS Pacific halibut landings by port for O32 Pacific halibut, 2023^{1,2}.

Offload Port	Trips	Tonnes	Pounds	Total USD	Average Price (USD/kg)	Average Price (USD/lb)
Cordova	1	3	6,676	\$32,603.00	\$10.77	\$4.88
Homer	1	3	7,358	\$49,429.50	\$14.81	\$6.72
Juneau	2	6	13,756	\$82,024.80	\$13.15	\$5.96
Ketchikan	2	6	12,817	\$76,772.40	\$13.21	\$5.99
King Cove	1	9	20,039	\$103,200.85	\$11.35	\$5.15
Kodiak	7	38	84,648	\$423,627.10	\$11.03	\$5.00
Port Angeles	1	2	3,709	\$17,946.50	\$10.67	\$4.84
Port Hardy	9	37	82,406	\$630,435.83	\$16.87	\$7.65
Prince Rupert	9	38	84,039	\$645,564.80	\$16.94	\$7.68
Sand Point	5	28	60,942	\$280,022.21	\$10.13	\$4.59
Seward	4	9	19,895	\$114,165.40	\$12.65	\$5.74
Sitka	4	39	86,246	\$475,027.54	\$12.14	\$5.51
Vancouver	1	1	3,022	\$25,205.31	\$18.39	\$8.34
Westport	1	2	4,712	\$26,118.31	\$12.22	\$5.54
Yakutat	1	2	3,350	\$19,052.25	\$12.54	\$5.69
Grand Total	49	224	49,3615	\$3,001,195.80	\$13.40	\$6.08

¹ Net weight (head-off, dressed, washed).

² Prices based on net weight.

Table 2c. FISS Pacific halibut landings by port for sampled U32 Pacific halibut, 2023^{1,2}.

Offload Port	Trips	Tonnes	Pounds	Total USD	Average Price (USD/kg)	Average Price (USD/lb)
Cordova	1	1	1,112	\$5,282.00	\$10.47	\$4.75
Homer	1	0	609	\$3,958.50	\$14.33	\$6.50
Juneau	2	0	417	\$2,347.50	\$12.41	\$5.63
Ketchikan	2	0	226	\$1,356.00	\$13.23	\$6.00
King Cove	1	0	608	\$3,131.20	\$11.35	\$5.15
Kodiak	7	2	3,572	\$15,828.90	\$9.77	\$4.43
Port Angeles	1	1	1,709	\$5,127.00	\$6.61	\$3.00
Port Hardy	9	1	1,963	\$13,270.80	\$14.90	\$6.76
Prince Rupert	9	1	1,897	\$12,951.10	\$15.05	\$6.83
Sand Point	5	1	3,057	\$12,228.16	\$8.82	\$4.00
Seward	4	1	1,151	\$4,833.40	\$9.26	\$4.20
Sitka	4	0	639	\$3,148.17	\$10.86	\$4.93
Vancouver	1	0	206	\$1,527.28	\$16.35	\$7.41
Westport	1	1	1,536	\$6,910.20	\$9.92	\$4.50
Yakutat	1	0	174	\$913.50	\$11.57	\$5.25
Grand Total	49	9	18,876	\$92,813.71	\$10.84	\$4.92

¹ Net weight (head-off, dressed, washed).

² Prices based on net weight.

Table 3a. FISS landings (total pounds and price) of all Pacific halibut (sampled U32 and all O32) by IPHC Regulatory Area in 2023¹.

IPHC Regulatory Area	2A	2B	2C	3A	3B	Total Weight and Average Price
Tonnes	5	58	69	34	67	232
Pounds	11,666	127,789	152,394	73,957	146,685	512,491
Price USD/kg	\$10.60	\$17.27	\$13.37	\$12.11	\$10.62	\$13.31
Price USD/lb	\$4.81	\$7.83	\$6.07	\$5.49	\$4.82	\$6.04

¹ Net weight (head-off, dressed, washed)

Table 3b. FISS landings (total pounds and price) of O32 Pacific halibut by IPHC Regulatory Area in 2023¹.

IPHC Regulatory Area	2A	2B	2C	3A	3B	Total Weight and Average Price
Tonnes	4	56	68	32	64	224
Pounds	8421	124,243	150,838	69,667	140,446	493,615
Price USD/kg	\$11.54	\$17.32	\$13.38	\$12.20	\$10.67	\$13.40
Price USD/lb	\$5.23	\$7.86	\$6.07	\$5.53	\$4.84	\$6.08

¹ Net weight (head-off, dressed, washed)

Table 3c. FISS landings (total pounds and price) of sampled U32 Pacific halibut by IPHC Regulatory Area in 2023¹.

IPHC Regulatory Area	2A	2B	2C	3A	3B	Total Weight and Average Price
Tonnes	1	2	1	2	3	9
Pounds	3245	3,546	1,556	4,290	6,239	18,876
Price USD/kg	\$8.18	\$15.22	\$12.40	\$10.71	\$9.43	\$10.84
Price USD/lb	\$3.71	\$6.90	\$5.63	\$4.86	\$4.28	\$4.92

¹ Net weight (head-off, dressed, washed)

FISS timing

Each year, the months of June, July, and August are targeted for FISS fishing. In 2023, this activity took place from 27 May through 1 September. On a coastwide basis, FISS vessel activity was highest in intensity at the beginning of the FISS season and declined early in August as boats finished their charter regions (Figure 8). All FISS activity was completed by early September.

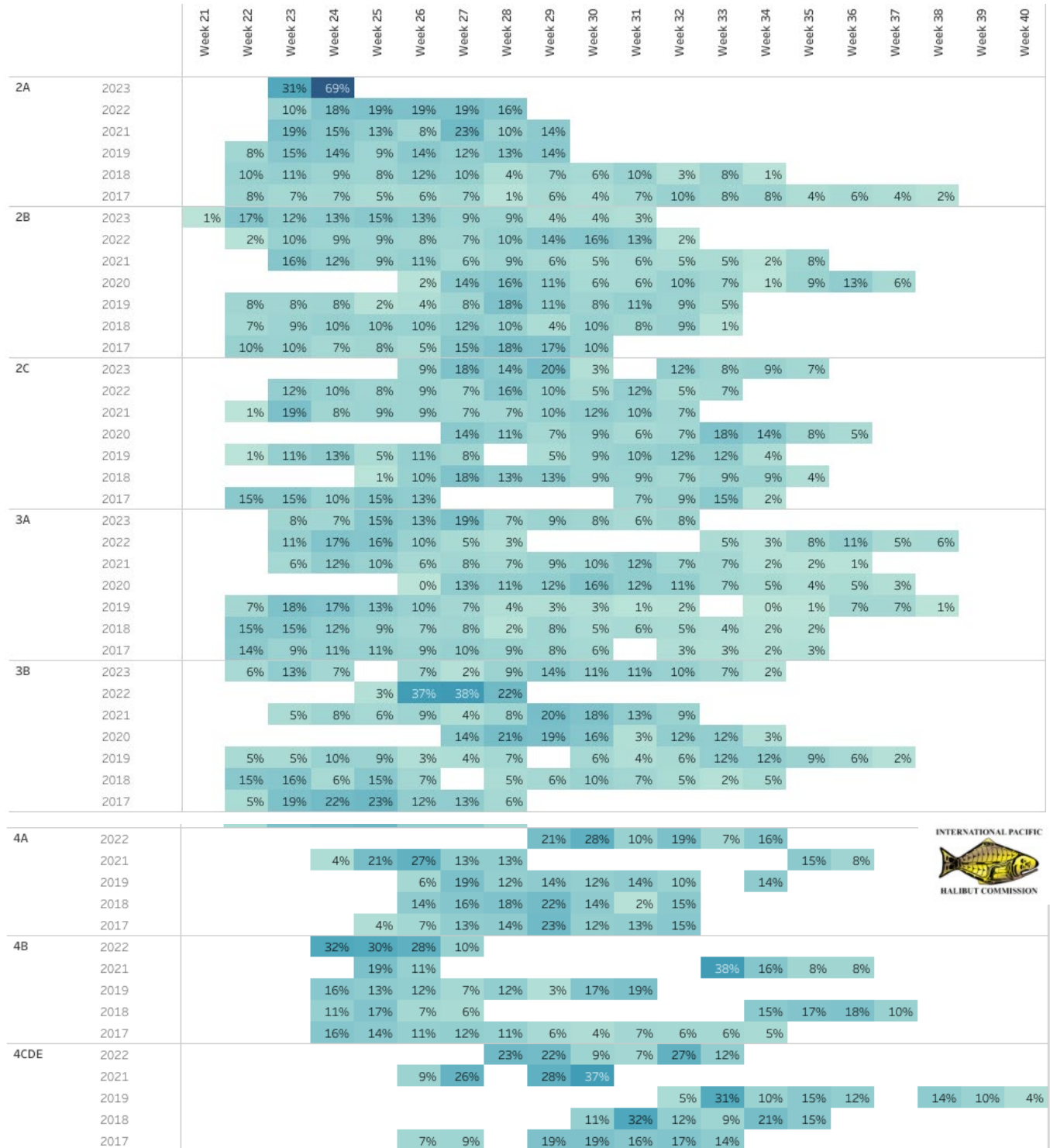


Figure 8. Percent of the total FISS stations completed by IPHC Regulatory Area during each week of the year (2017-2023). Week 21 begins in late May or early June depending on the year.

RECOMMENDATION/S

That the RAB:

- 1) **NOTE** paper IPHC-2023-RAB024-07 which provides a summary of the IPHC Fishery-Independent Setline Survey (FISS) design and implementation in 2023.

APPENDICES

Nil.