Fishery statistics (2018)

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PURPOSE

To provide an overview of the key fishery statistics from fisheries catching Pacific halibut during 2018, including the status of landings compared to fishery limits implemented by the Contracting Parties of the Commission.

BACKGROUND

The International Pacific Halibut Commission (IPHC) estimates all Pacific halibut (*Hippoglossus stenolepis*) removals taken in the IPHC Convention Area and uses this information in its yearly stock assessment (see IPHC-2018-IM094-08 Rev_1) and other analyses. The data are compiled by the IPHC Secretariat and include data from Federal and State agencies of each Contracting Party. All 2018 data are in net weight (head-off, dressed, ice and slime deducted) and are considered preliminary at this time.

This paper includes Pacific halibut removals for:

- Commercial fisheries, including landings and discard mortality
- Recreational fisheries, including landings and discard mortality
- Subsistence fisheries
- Bycatch in other fisheries (e.g. trawl, pot, longline)
- IPHC Fishery-Independent Setline Survey (FISS) and other research

Figure 1 shows the distribution of Pacific halibut removals (mortality) by these fishery sources in 2018. Table 1 provides estimates of total removals by IPHC Regulatory Area (Figure 2).

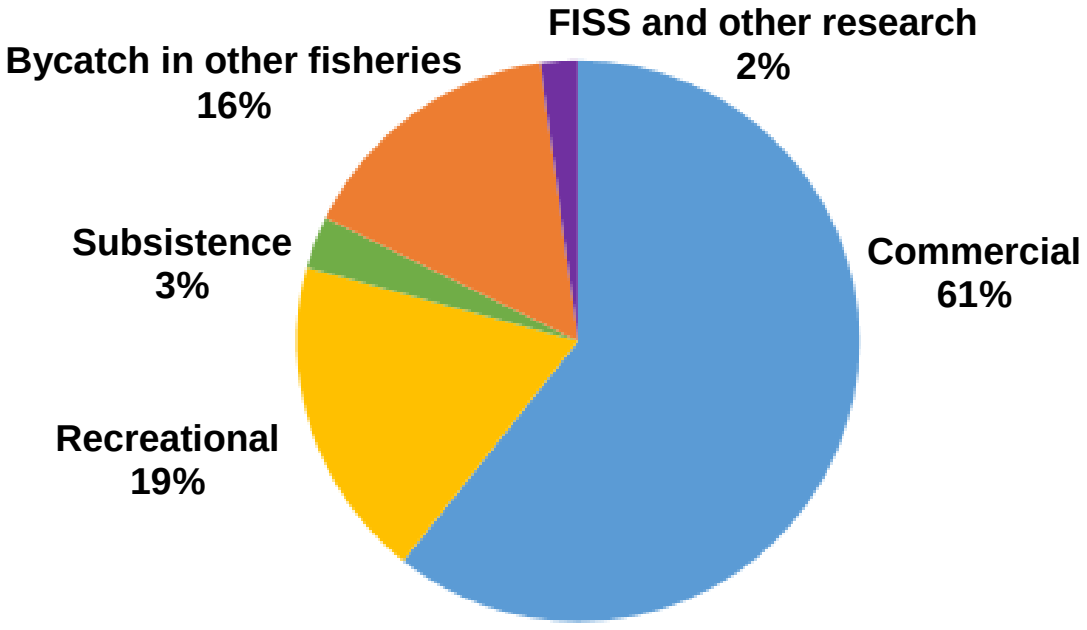

Figure 1. Distribution of Pacific halibut mortality by source in 2018.

Table 1. 2018 estimates of total removals (net weight), including fishery limits and mortality of Pacific halibut by IPHC Regulatory Area. Preliminary as of 20 November 2018. Totals have been rounded.

IPHC Regulatory Area	Fishery limits (net weight)		Mortality (net weight)		Percent
	Pounds (lb)	Tonnes (t)	Pounds (lb)	Tonnes (t)	%
Area 2A (California, Oregon, and Washington)	1,324,000	600.56	1,353,559	613.96	102
Non-treaty directed commercial (south of Pt. Chehalis)	201,845	91.56	203,630	92.36	101
Non-treaty incidental catch in salmon troll fishery	35,620	16.16	34,903	15.83	98
Non-treaty incidental catch in sablefish fishery (north of Pt. Chehalis)	50,000	22.68	43,716	19.83	87
Treaty Indian commercial	389,500	176.67	403,754	183.14	104
Commercial discard mortality	20,000	9.07	20,000	9.07	100
Recreational – Washington	225,366	102.22	222,261	100.82	99
Recreational – Oregon	229,730	104.20	211,450	95.91	92
Recreational – California	30,940	14.03	31,156	14.13	101
Recreational discard mortality	4,000	1.81	4,000	1.81	100
Treaty Indian ceremonial and subsistence (year-round)	27,000	12.25	27,000	12.25	100
Bycatch in other fisheries[1]	110,000	49.90	129,000	58.51	117
IPHC fishery-independent setline survey and research	none	none	22,689	10.29	n/a
Area 2B (British Columbia)	7,050,745	3,198.16	7,163,040	3,249.10	102
Commercial fishery	5,295,995	2,402.22	5,292,558	2,400.66	100
Commercial discard mortality	150,000	68.04	138,000	62.60	92
Recreational fishery	927,990	420.93	802,174	363.86	86
Recreational discard mortality[1]	41,760	18.94	74,000	33.57	177
Recreational fishery (XRQ)	n/a	n/a	16,648	7.55	n/a
Subsistence[1]	405,000	183.70	405,000	183.70	100
Bycatch in other fisheries[1]	230,000	104.33	290,000	131.54	126
IPHC fishery-independent setline survey and research	none	none	144,660	65.62	n/a
Area 2C (southeastern Alaska)	6,336,500	2,874.19	6,331,800	2,872.06	100
Commercial fishery	3,570,000	1,619.32	3,401,415	1,542.86	97
Commercial discard mortality	70,000	31.75	59,000	26.76	84
Metlakatla (Annette Island Reserve)	0	0.00	31,196	14.15	n/a
Guided recreational fishery	810,000	367.41	668,000	303.00	90[3]
Guided recreational discard mortality[2]	n/a	n/a	62,000	28.12	n/a
Guided recreational fishery (GAF)[1]	n/a	n/a	64,365	29.20	n/a
Unguided recreational fishery[1]	1,430,000	648.64	1,362,000	617.79	96[3]
Unguided recreational discard mortality[2]	n/a	n/a	16,000	7.26	n/a
Subsistence[1]	436,500	197.99	436,500	197.99	100
Bycatch in other fisheries[1]	20,000	9.07	32,000	14.51	160
IPHC fishery-independent setline survey and research	none	none	199,324	90.41	n/a
Area 3A (central Gulf of Alaska)	12,552,500	5,693.72	13,297,195	6,031.51	106
Commercial fishery	7,350,000	3,333.90	7,189,035	3,260.89	98
Commercial discard mortality	320,000	145.15	285,000	129.27	89
Guided recreational fishery	1,790,000	811.93	1,850,000	839.15	104[3]
Guided recreational discard mortality[2]	n/a	n/a	17,000	7.71	n/a
Guided recreational fishery (GAF)	n/a	n/a	9,052	4.11	n/a
Unguided recreational fishery[1]	1,860,000	843.68	1,738,000	788.34	95[3]
Unguided recreational discard mortality[2]	n/a	n/a	28,000	12.70	n/a
Subsistence[1]	222,500	100.92	222,500	100.92	100
Bycatch in other fisheries[1]	1,010,000	458.13	1,654,000	750.24	164
IPHC fishery-independent setline survey and research	none	none	304,608	138.17	n/a

continued …

Table 1 continued. 2018 estimates of total removals (net weight), including fishery limits and mortality of Pacific halibut by IPHC Regulatory Area. Preliminary as of 20 November 2018. Totals have been rounded.

IPHC Regulatory Area	Fishery limits (net weight)		Mortality (net weight)		Percent
	Pounds (lb)	Tonnes (t)	Pounds (lb)	Tonnes (t)	%
Area 3B (western Gulf of Alaska)	3,274,200	1,485.15	3,199,286	1,451.17	98
Commercial fishery	2,620,000	1,188.41	2,437,783	1,105.76	93
Commercial discard mortality[1]	180,000	81.65	208,000	94.35	116
Recreational fishery[1]	10,000	4.54	2,000	0.91	20
Recreational discard mortality	0	0.00	0	0.00	n/a
Subsistence[1]	14,200	6.44	14,200	6.44	100
Bycatch in other fisheries[1]	450,000	204.12	463,000	210.01	103
IPHC fishery-independent setline survey and research	none	none	74,303	33.70	n/a
Area 4A (eastern Aleutians)	1,748,100	792.92	1,612,756	731.53	92
Commercial fishery	1,370,000	621.42	1,216,519	551.80	89
Commercial discard mortality[1]	60,000	27.22	68,000	30.84	113
Recreational fishery[1]	20,000	9.07	11,000	4.99	55
Recreational discard mortality	0	0.00	0	0.00	n/a
Subsistence[1]	8,100	3.67	8,100	3.67	100
Bycatch in other fisheries[1]	290,000	131.54	275,000	124.74	95
IPHC fishery-independent setline survey and research	none	none	34,137	15.48	n/a
Area 4B (central/western Aleutians)	1,280,300	580.73	1,311,177	594.74	102
Commercial fishery	1,050,000	476.27	1,036,707	470.24	99
Commercial discard mortality[1]	30,000	13.61	19,000	8.62	63
Recreational fishery[1]	0	0.00	0	0.00	n/a
Recreational discard mortality	0	0.00	0	0.00	n/a
Subsistence[1]	300	0.14	300	0.14	100
Bycatch in other fisheries[1]	200,000	90.72	227,000	102.97	114
IPHC fishery-independent setline survey and research	none	none	28,170	12.78	n/a
Area 4CDE (Bering Sea)[4]	3,613,080	1,638.87	4,501,592	2,014.89	125
Commercial fishery	1,580,000	716.68	1,410,070	639.60	89
Commercial discard mortality[1]	20,000	9.07	27,000	12.25	135
Recreational fishery[1]	0	0.00	0	0.00	n/a
Recreational discard mortality	0	0.00	0	0.00	n/a
Subsistence[1]	53,080	24.08	55,689	25.26	105
Bycatch in other fisheries[1]	1,960,000	889.04	2,987,000	1,354.88	152
IPHC fishery-independent setline survey and research	none	none	21,833	9.90	n/a
Totals	37,179,426	16,864.30	38,771,405	17,586.41	104
Commercial fishery	23,512,960	10,665.30	22,701,286	10,297.13	97
Commercial discard mortality	850,000	385.55	825,000	374.21	97
Recreational fishery	7,334,026	3,326.66	7,111,106	3,225.54	97
Recreational discard mortality[5]	45,760	20.76	78,000	35.38	170
Subsistence[1]	1,166,680	529.20	1,169,289	530.38	100
Bycatch in other fisheries[1]	4,270,000	1,936.84	6,057,000	2,747.41	142
IPHC fishery-independent setline survey and research	none	none	829,724	376.36	n/a

[1] 'Limit' is value from 2017 estimates which were used in setting the TCEY for each IPHC Regulatory Area.
[2] Limit included in limit listed above.
[3] Includes recreational discard mortality.
[4] Landings in IPHC Regulatory Area 4CDE are combined to meet confidentiality requirements.
[5] Limit for IPHC Regulatory Areas 2A and 2B only. Recreational discard mortality limits included with recreational fishery limits for all other IPHC Regulatory Areas.
n/a = not available and XRQ = Experimental Quota and GAF = Guided Angler Fish (XRQ and GAF leased from commercial quota).

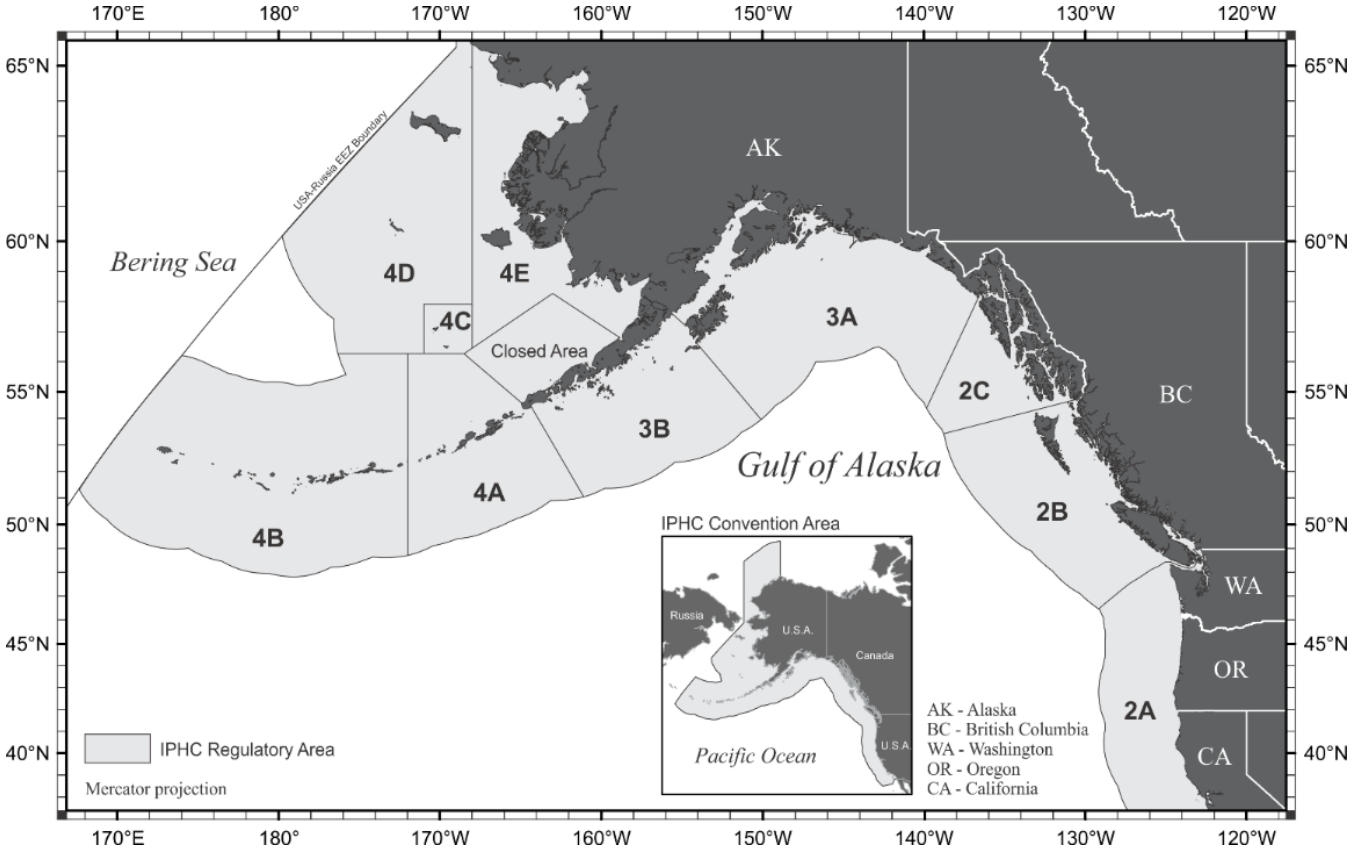

Figure 2. Map of the IPHC Convention Area (insert) and IPHC Regulatory Areas.

DEFINITIONS

Commercial fisheries: include commercial landings and discard mortality. Commercial discard mortality continues to include estimates of sub-legal Pacific halibut (under 32 inches (81.3 cm), also called U32), fish that die on lost or abandoned fishing gear, and fish discarded for regulatory compliance reasons.

Recreational fisheries: include recreational landings (including landings from commercial leasing) and discard mortality.

Subsistence fisheries (formerly called personal use/subsistence): are non-commercial, customary, and traditional use of Pacific halibut for direct personal, family, or community consumption or sharing as food, or customary trade. Subsistence fisheries include:

i) ceremonial and subsistence (C&S) removals in the IPHC Regulatory Area 2A treaty Indian fishery,
ii) the sanctioned First Nations Food, Social, and Ceremonial (FSC) fishery conducted in British Columbia,
iii) federal subsistence fishery in Alaska, USA that uses Alaska Subsistence Halibut Registration Certificate (SHARC), and
iv) U32 Pacific halibut retained in IPHC Regulatory Areas 4D and 4E by the CDQ fishery for personal use.

Bycatch: incidentally caught Pacific halibut by fisheries targeting other species and that cannot legally be retained, e.g. by the trawl fleet. Bycatch mortality, or bycatch removals, refers only to those Pacific halibut that subsequently die due to capture.

IPHC FISS and Research: includes Pacific halibut landings and removals as a result of the IPHC fishery-independent setline survey and other research.

COMMERCIAL FISHERIES

The IPHC's commercial fisheries span from northern California through to northern and western Alaska in USA and Canada waters of the northeastern Pacific Ocean. The IPHC sets annual limits for the catch of Pacific halibut in each IPHC Regulatory Area. Participants in these commercial fisheries use longline and pot gear to catch Pacific halibut for sale. The commercial Pacific halibut fisheries in IPHC Regulatory Area 2A consisted of the directed commercial fishery with fishing period limits, the incidental Pacific halibut catch during the salmon troll and limited-entry sablefish fisheries, and the treaty Indian fisheries. Farther north, the commercial fisheries consisted of the Individual Vessel Quota (IVQ) fishery in IPHC Regulatory Area 2B, the Individual Fishing Quota (IFQ) system in Alaska, USA, the Community Development Quota (CDQ) fisheries in IPHC Regulatory Areas 4B and 4CDE, and the Metlakatla fishery in IPHC Regulatory Area 2C. All 2018 landing and discard mortality data presented in this document are preliminary.

Commercial Fishing Periods

The Canadian IVQ fishery in IPHC Regulatory Area 2B and the USA IFQ and CDQ fisheries in IPHC Regulatory Areas 2C, 3A, 3B, 4A, 4B, 4C, 4D, and 4E commenced at 12 noon local time on 24 March and closed at 12 noon local time on 7 November 2018 (Table 2). The IPHC Regulatory Area 2A commercial fisheries, including the treaty Indian commercial fisheries, occurred during the same calendar period (24 March to 7 November 2018). For IPHC Regulatory Area 2A, seven potential 10-hour fishing periods for the non-treaty directed commercial fishery were adopted: 27 June, 11 July, 25 July, 8 August, 22 August, 5 September, and 19 September 2018. All fishing periods began at 0800 and ended at 1800 local time, were further restricted by fishing period limits, and closed for the remainder of the year after the third opening on 25 July when the IPHC Regulatory Area 2A directed commercial fishery allocation was estimated to have been reached.

Table 2. Fishing periods for commercial Pacific halibut fisheries by IPHC Regulatory Area, 2009-18.

IPHC Regulatory Area	Year									
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
2A Treaty Indian	21 Mar- 15 Jul (117) 21 Mar-9 May	6 Mar–20 Mar (14) 6 Mar-8 Apr	20-22 Mar (2) 1-2 May (19 h) 12-19 Mar 24-28 Mar (13)	24-26 Mar (2) 1 May (13 hrs) 17-19 Mar (55 hrs)	23-25 Mar (48 hrs) 2-4 Apr, 15-16 Apr, 8 May, 6 Jun, 13 Jul 20 Jul 3 Aug	11-13 Mar (48 hrs) 20-21Mar, 8May 8 May	16-18 Mar (48 hrs) 1-2 Apr	19-21 Mar,20-21 Mar, 21-23 Mar 1-2 Apr 1-2,11-12 May, 18 May-15 Aug, 25 Jul-2 Aug, 12 Sep-7 Nov	20 Mar, 15-16 Apr 1-2 May 19-20 May, 22-23 May 18-19 Jun 21-22 Jul	24 Mar – 28 Apr (36 hrs) 24 Mar – 28 Apr (37 hrs) 4 May – 23 May (30 hrs)
2A Commercial Directed	24 Jun (10 hrs) 8 Jul (10 hrs)	30 Jun (10 hrs)	29 Jun (10 hrs) 13 Jul (10 hrs)	27 Jun (10 hrs) 11 Jul (10 hrs)	26 Jun (10 hrs) 10 Jul (10 hrs)	25 Jun (10 hrs) 9 Jul (10 hrs)	24 Jun (10 hrs) 8 Jul (10 hrs)	22 Jun (10 hrs) 6 Jul (10 hrs) 20 Jul (10 hrs)	28 Jun (10 hrs) 12 Jul (10 hrs) 26 Jul (10 hrs)	27 Jun (10 hrs) 11 Jul (10 hrs) 25 Jul (10 hrs)
2A Commercial Incidental	Salmon 1 May–15 Nov (199) Sablefish 1 May–31 Oct (184)	Salmon 1 May–16 Jun (45) Sablefish No fishery	Salmon 1 May–28 May (28) 29 Jul–31 Oct (94) Sablefish No fishery	Salmon 1 May–3 Jul (64) Sablefish 1 May–31 Oct (184)	Salmon 1 May–10 Aug (101) Sablefish 1 May–31 Oct (184)	Salmon 1 Apr–11 Sep (163) Sablefish 1 Apr–31 Oct (213)	Salmon 1 Apr–21 Aug (142) Sablefish 1 Apr–31 Aug (152)	Salmon 1 Apr–31 Oct (213) Sablefish 1 Apr–31 Oct (213)	Salmon 1 Apr–3 Aug (124) Sablefish 1 Apr–31 Oct (213)	Salmon 1 May–8 Aug (99) Sablefish 1 Apr–31 Oct (213)
2B	21 Mar–15 Nov (240)	6 Mar–15 Nov (255)	12 Mar–18 Nov (252)	17 Mar–7 Nov (236)	23 Mar–7 Nov (230)	8 Mar–7 Nov (244)	14 Mar–7 Nov (238)	19 Mar–7 Nov (233)	11 Mar–7 Nov (241)	24 Mar–7 Nov (228)
Alaska, USA (2C, 3A, 3B, 4A, 4B, 4CDE)	21 Mar–15 Nov (240)	6 Mar–15 Nov (255)	12 Mar–18 Nov (252)	17 Mar–7 Nov (236)	23 Mar–7 Nov (230)	8 Mar–7 Nov (244)	14 Mar–7 Nov (238)	19 Mar–7 Nov (233)	11 Mar–7 Nov (241)	24 Mar–7 Nov (228)

Commercial Landings

Commercial landings and fishery limits by IPHC Regulatory Area for the 2018 fishing season are shown in Table 3. Commercial fishery limit, as referred to here, is the IPHC commercial fishery limit set by the Contracting Parties following the Annual Meeting. The fishery limits with adjustments from the underage and overage programs from the previous year's quota share programs, and in IPHC Regulatory Area 2B, it also includes relinquishment of quota and quota leasing programs among sectors and the Use of Fish allocation are not presented. Historical landings and fishery limits from 2009 through 2018 are shown in Table 3.

The 2018 commercial fishery landings were spread over nine months of the year (Table 4). On a month-to-month comparison, April took the lead as the busiest month for total poundage (17%) landed from IPHC Regulatory Area 2B. On a month-to-month comparison, May and August were the busiest months for total poundage (17%) from Alaska, USA.

Table 3. Pacific halibut commercial landings, discard mortality, fishery limits and percent of fishery limit attained (thousands of pounds, net weight) by IPHC Regulatory Area, 2009-18.

IPHC Regulatory Area	**Commercial Landings**									
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
2A	485	408	524	556	526	510	551	642	744	686
2B	6,538	6,607	6,612	5,874	5,952	5,776	5,884	6,046	6,131	5,293
2C[1]	4,865	4,390	2,363	2,575	2,912	3,275	3,602	3,877	4,098	3,433
3A	21,399	20,186	14,379	11,735	10,852	7,383	7,722	7,308	7,668	7,189
3B	10,614	9,958	7,218	4,932	4,009	2,815	2,574	2,609	2,997	2,438
4A	2,464	2,265	2,316	1,543	1,207	833	1,336	1,346	1,260	1,217
4B	1,534	1,785	2,022	1,715	1,224	1,091	1,080	1,084	1,050	1,037
4CDE	3,280	3,287	3,414	2,328	1,758	1,243	1,173	1,463	1,621	1,410
Total	51,179	48,886	38,846	31,258	28,440	22,928	23,922	24,375	25,569	22,701
IPHC Regulatory Area	**Commercial Discard Mortality**									
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
2A	52	27	25	25	25	21	31	37	19	20
2B	354	302	283	220	211	250	238	229	175	138
2C[1]	304	261	83	95	110	119	121	123	87	59
3A	1,175	1,450	930	593	519	443	521	378	347	285
3B	796	903	770	526	404	326	215	232	234	208
4A	157	138	144	95	70	35	79	54	67	68
4B	18	37	43	38	35	56	36	60	31	19
4CDE	90	95	191	75	56	52	52	65	28	27
Total	2,946	3,213	2,469	1,667	1,430	1,302	1,293	1,178	988	825
IPHC Regulatory Area	**Commercial Total Removals**									
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
2A	537	435	549	581	551	531	582	679	763	706
2B	6,892	6,909	6,895	6,094	6,163	6,026	6,122	6,275	6,306	5,447
2C[1]	5,169	4,651	2,446	2,670	3,022	3,394	3,723	4,000	4,185	3,556
3A	22,574	21,636	15,309	12,328	11,371	7,826	8,243	7,686	8,015	7,483
3B	11,410	10,861	7,988	5,458	4,413	3,141	2,789	2,841	3,231	2,646
4A	2,621	2,403	2,460	1,638	1,277	868	1,415	1,400	1,327	1,281
4B	1,552	1,822	2,065	1,753	1,259	1,147	1,116	1,144	1,081	1,056
4CDE	3,370	3,382	3,605	2,403	1,814	1,295	1,225	1,528	1,649	1,437
Total	54,125	52,099	41,315	32,925	29,870	24,230	25,215	25,553	26,557	23,526
IPHC Regulatory Area	**Commercial Fishery Limits**									
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
2A	511.2	420	480.7	546.6	539.7	519.6	511.5	642.3	771.3	677
2B	6,712	6,599	6,702	5,953	5,958	5,793	5,974	6,199	6,272	5,296
2C	5,020	4,400	2,330	2,624	2,970	3,319	3,679	3,924	4,212	3,570
3A	21,700	19,990	14,360	11,918	11,030	7,318	7,790	7,336	7,739	7,350
3B	10,900	9,900	7,510	5,070	4,290	2,840	2,650	2,710	3,140	2,620
4A	2,550	2,330	2,410	1,567	1,330	850	1,390	1,390	1,390	1,370
4B	1,870	2,160	2,180	1,869	1,450	1,140	1,140	1,140	1,140	1,050
4CDE	3,460	3,580	3,720	2,464	1,930	1,285	1,285	1,660	1,700	1,580
Total	52,723	49,379	39,693	32,012	29,498	23,064	24,420	25,001	26,364	26,364
IPHC Regulatory Area	**Commercial Limits – Percent Attained**									
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
2A	105	104	114	106	102	102	114	106	99	101
2B	103	105	103	102	103	104	102	101	101	100
2C[1]	103	106	105	102	102	102	101	102	99	98
3A	104	108	107	103	103	107	106	105	104	98
3B	105	110	106	108	103	111	105	105	103	93
4A	103	103	102	105	96	102	102	101	95	89
4B	83	84	95	94	87	101	98	100	95	99
4CDE	97	94	97	98	94	101	95	92	97	89
Total	103	106	104	103	101	105	103	102	101	97

[1] In Area 2C, includes the Metlakatla fishery landed catch.

Table 4. The total pounds (thousands, net weight, preliminary) of 2018 commercial landings of Pacific halibut for Alaska, USA and British Columbia, Canada by IPHC Regulatory Area and month.

IPHC Regulatory Area	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Total
2B[1]	468	802	746	653	752	582	612	507	195	5,293
2C[2]	315	680	691	413	200	413	393	222	74	3,401
3A[2]	321	1,163	1,449	1,071	699	806	871	615	193	7,189
3B[2]	-	175[3]	390	277	210	483	538	269	95	2,438
4A[2]	-	-	181[3]	153	106	378	288	102	8	1,217
4B[2]	-	-	269[3]	156	-	427[3]	128	57	-	1,037
4CDE[2]	-	-	49	109	329	555	257	111[4]	-	1,410
Alaska, USA Total	636	2,019	3,030	2,180	1,544	3,061	2,476	1,377	370	16,692
Grand Total	1,104	2,821	3,777	2,809	2,296	3,642	3,088	1,884	565	21,984

[1] Based on landings from DFO Fishery Operations System (FOS).
[2] Based on landings from NOAA Fisheries Restricted Access Management (RAM) Division.
[3] Weight combined with the previous months for confidentiality purposes.
[4] Weight combined with the following month for confidentiality purposes.
n/a = not available

IPHC Regulatory Area 2A (USA: Washington, Oregon, California)

The 2018 IPHC Regulatory Area 2A fisheries and respective fishery limits are listed in Table 1. The total IPHC Regulatory Area 2A removals (not including IPHC FISS and other research) of 686,000 pounds (311 t) was within 1% of the fishery limit. The total directed commercial landings of 203,630 pounds (92 t) were 1% over the fishery limit of 201,845 pounds (92 t) after three 10-hour openers. The fishing period limits by vessel size class for each opening in 2018 are listed in Table 5. At the start of the season on 1 May, the allowable incidental landing ratio of Pacific halibut during the salmon troll fishery was one Pacific halibut per two Chinook (*Oncorhynchus tshawytscha*), plus an "extra" Pacific halibut per landing, and a vessel trip limit of 25 fish. The fishery closed on 14 July and was reopened on 24 July with revised landing restrictions of one Pacific halibut per three Chinook, plus an "extra" Pacific halibut per landing, and a vessel trip limit of 10 fish. The incidental Pacific halibut retention closed on 8 August, with total landings of 34,903 pounds (16 t) which was 2% under the fishery limit (35,620 pounds (16 t)). Incidental Pacific halibut retention during the limited-entry sablefish fishery remained open from 1 April to noon on 31 October. Beginning 1 April, the allowable landing ratio was 140 pounds (0.06 t) (net weight) of Pacific halibut to 1,000 pounds (0.45 t) (net weight) of sablefish, and up to two additional Pacific halibut in excess of the ratio limit. Effective 23 April, the landing ratio was modified to 160 pounds (0.07 t) (net weight) of Pacific halibut to 1,000 pounds (0.45 t) (net weight) of sablefish, and up to two additional Pacific halibut in excess of the ratio limit. The final revision to the landing ratio was made 9 October to 200 pounds (0.09 t) (net weight) of Pacific halibut to 1,000 pounds (0.45 t) (net weight) of sablefish, and up to two additional Pacific halibut in excess of the ratio limit. The total landings of 43,716 pounds (20 t) were 13% under the fishery limit (50,000 pounds (23 t)).

In IPHC Regulatory Area 2A, north of Point Chehalis, the treaty Indian tribes manage the commercial landings by allocating 75% to an open access fishery and 25% to a restricted fishery

with daily and vessel limits. There were two unrestricted, open access fisheries on 24 March to 28 April and 15–16 April and one restricted fishery, including a vessel per day limit of 500 pounds (0.23 t) for the 1-2 May opening. The 2018 tribal commercial season closed to all parties on 7 November, following the late fisheries, with total landings of 403,754 pounds (183 t), 4% over the fishery limit (389,500 pounds (177 t)).

Table 5. The fishing periods and limits (pounds, dressed, head-on with ice/slime) by vessel class used in the 2018 directed commercial fishery in IPHC Regulatory Area 2A.

Vessel Class		Fishing Period (dates) & Limits (lb)	
Letter	**Feet**	**27 June and 11 July**	**25 July**
A	≤25	860	380
B	26-30	1,075	475
C	31-35	1,715	760
D	36-40	4,735	2,100
E	41-45	5,090	2,260
F	46-50	6,095	2,710
G	51-55	6,800	3,025
H	56+	10,225	4,545

IPHC Regulatory Area 2B (British Columbia, Canada)

Under the IVQ fishery in British Columbia, Canada, the number of active Pacific halibut licences (L licences), and First Nations communal commercial licences (FL licences) was 146 in 2018. In addition, Pacific halibut can be landed as incidental catch in other licensed groundfish fisheries. Therefore, Pacific halibut was landed from a total of 224 active licences in 2018, with 78 of these licences from other fisheries. The 2018 commercial landings of 5,293,000 pounds (2,401 t) were less than 1% under the fishery limit (5,296,000 pounds (2,402 t)) (Table 3).

Commercial trips from IPHC Regulatory Area 2B were delivered into 17 different ports in 2018. The ports of Port Hardy (including Coal Harbour and Port McNeill) and Prince Rupert/Port Edward were the major landing locations, receiving 89% of the commercial landings. Port Hardy received 44% while Prince Rupert received 46% (2,337,000 and 2,437,000 pounds (1,060 and 1,105 t), respectively) of the commercial landings. All of the IVQ landings were landed in IPHC Regulatory Area 2B. The 2018 landings of live Pacific halibut from IPHC Regulatory Area 2B was legally allowed by Fisheries and Oceans Canada (DFO) and resulted in a total landed weight of 89 pounds. Only Canadian vessels landed frozen, head-off Pacific halibut in 2018, and only in Canadian ports: 71 landings (92,148 net lbs; ~41.8 t) reported frozen-at-sea head-off product from 29 vessels.

IPHC Regulatory Areas 2C, 3, and 4 (USA: Alaska)

In Alaska, USA, the National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries) Restricted Access Management (RAM) allocated Pacific halibut quota share (QS) to recipients by IPHC Regulatory Area. Quota share transfers were permitted with restrictions on the amount of QS a person could hold and the amount that could be fished per vessel. In 2018, RAM reported that 2,330 persons held QS.

The total 2018 landings from the IFQ/CDQ Pacific halibut fishery for the waters off Alaska, USA were 16,692,000 pounds (7,571 t), less than 5% under the fishery limit (Table 4). By IPHC Regulatory Area, the landings were under the fishery limit by 2% for Area 2C, 2% for Area 3A, 7% for Area 3B, 11% for Area 4A, and 1% for Area 4B. The total combined IPHC Regulatory Area 4CDE commercial landings of 1,410,000 pounds (640 t) were 11% under the combined Area 4CDE fishery limit (1,580,000 pounds (717 t)). The North Pacific Fishery Management Council's Catch Sharing Plan allowed IPHC Regulatory Area 4D CDQ to be harvested in IPHC Regulatory Areas 4D or 4E and Area 4C IFQ and CDQ to be fished in Areas 4C or 4D.

Seward received approximately 14% (2,317,000 pounds (1,051 t)) of the commercial landings of Alaskan catch making it the port that received the greatest number of pounds in 2018. Homer received the second and Kodiak the third largest landing volume at 14% (2,258,000 pounds, 1,024 t) and 12% (2,079,000 pounds, 943 t) of the Alaskan commercial landings, respectively. In Southeast Alaska, the two largest landing volumes were received in Petersburg (1,223,000 pounds (555 t)), Sitka (1,142,000 pounds (518 t)), in that order, and their combined landings represented 14% of the commercial Alaskan landings. The Alaskan QS catch that was landed outside of Alaska, USA was 2%.

The Metlakatla Indian Community (within IPHC Regulatory Area 2C) was authorized by the United States government to conduct a commercial Pacific halibut fishery within the Annette Islands Reserve. There were 14 two-day openings between 23 March and 30 September for total landings of 31,196 pounds (14 t) (Table 6). This was lower than the 2017 landings, and within the historical landing range that has varied over time from a low of 12,000 pounds (5 t) in 1998 to a high of 126,000 pounds (57 t) in 1996.

Table 6. Metlakatla community fishing periods, number of vessels, and preliminary Pacific halibut landings (net weight) in IPHC Regulatory Area 2C, 2018.

Fishing Period Dates	Landings		Number of Vessels
	(Pounds)	(Tonnes)	
23 – 25 March	1,877	0.85	5
06 – 08 April	748	0.34	4
20 – 22 April	1,645	0.75	6
04 – 06 May	2,552	1.16	8
25 – 27 May	1,087	0.49	6
08 – 10 June	1,519	0.69	5
22 – 24 June	1,588	0.72	5
06 – 08 July	1,535	0.70	4
20 – 22 July	1,999	0.91	4
03 – 05 August	4,320	1.96	7
17 – 19 August	6,882	3.12	12
31 August – 02 September	2,910	1.32	11
14 – 16 September	2,354	1.07	7
28 – 30 September	180	0.08	2
Total	31,196	14.15	14 Openings

Commercial Discard Mortality

Incidental mortality of Pacific halibut in the commercial Pacific halibut fishery is the mortality of all Pacific halibut that do not become part of the landed catch. The three main sources of discard mortality estimate include: 1) fish that are captured and discarded because they are below the legal size limit of 32 inches (81.3 cm), 2) fish that are estimated to die on lost or abandoned fishing gear, and 3) fish that are discarded for regulatory reasons (e.g. the vessels trip limit has been exceeded). The methods that are applied to produce each of these estimates differ due to the amount and quality of information available. Information on lost gear and regulatory discards is collected through logbook interviews and fishing logs received by mail. The ratio of U32 to O32 Pacific halibut (>32 inches in length) is determined from the IPHC fisheries-independent setline survey in most areas and by direct observation in the IPHC Regulatory Area 2B fishery. Different mortality rates are applied to each category: released Pacific halibut have a 16% mortality rate and Pacific halibut mortality from lost gear is 100%.

Pacific halibut discard mortality estimates from the commercial Pacific halibut fishery are summarized by IPHC Regulatory Area in Table 1 and over a series of years in Table 3.

RECREATIONAL FISHERIES

The 2018 recreational removals of Pacific halibut, including discard mortality, was estimated at 7,189,000 pounds (3,261 t), a decrease of the recreational harvest in 2017 by 938,000 pounds (488 t). Changes in harvests varied across areas; in some cases, in response to changes in size restrictions. Recreational fishery limits and landings are detailed by IPHC Regulatory Area in Table 7, and summarized in Table 1.

Table 7. Recreational removals and limits of Pacific halibut (in thousands of pounds, net weight) by IPHC Regulatory Area, 2013-18.

IPHC Regulatory Area	Recreational Retained					
	2013	2014	2015	2016	2017	2018
2A	501	476	445	504	515	465
2B – XRQ Leased	8	5	5	7	8	17
2B	814	913	981	1,021	1,138	802
2B	822	918	986	1,028	1,146	819
2C – GAF Leased	-	54	28	39	41	64
2C – Charter	762	783	768	789	901	668
2C – Noncharter	1,361	1,171	1,327	1,246	1,218	1,362
2C	2,123	2,008	2,123	2,074	2,160	2,094
3A – GAF Leased	-	10	5	9	7	9
3A – Charter	2,514	2,034	2,067	2,004	2,076	1,850
3A – Noncharter	1,452	1,533	1,616	1,538	1,530	1,738
3A	3,966	3,577	3,688	3,551	3,613	3,597
3B	15	7	5	8	1	2
4A	9	9	7	15	6	11
4B and 4CDE	-	-	-	-	-	-
Total	7,428	6,926	7,216	7,125	7,441	6,988
IPHC Regulatory Area	Recreational Discard Mortality					
	2013	2014	2015	2016	2017	2018
2A	4	4	4	4	4	4
2B	45	33	61	66	52	74
2C – Charter	42	46	47	51	41	62
2C – Noncharter	28	16	18	19	15	16
2C	70	62	65	70	56	78
3A – Charter	49	43	36	29	22	17
3A – Noncharter	30	26	37	27	23	28
3A	79	69	73	56	45	44
3B and 4	-	-	-	-	-	-
Total	198	168	177	167	146	155
IPHC Regulatory Area	Recreational Total Removals					
	2013	2014	2015	2016	2017	2018
2A	505	480	449	508	518	469
2B	866	951	1,047	1,094	1,197	893
2C	2,193	2,070	2,188	2,144	2,216	2,172
3A	4,045	3,646	3,761	3,607	3,658	3,642
3B	15	7	5	8	1	2
4A	9	9	7	15	6	11
4B and 4CDE	-	-	-	-	-	-
Total	7,633	7,184	7,456	7,376	8,127	7,189
IPHC Regulatory Area	Recreational Limits					
	2013	2014	2015	2016	2017	2018
2A	418	412	427	464	529	497
2B	1,080	1,057	1,064	1,101	1,118	928
2C	788	761	851	906	915	810
3A	2,734	1,782	1,890	1,814	1,890	1,790
3B and 4	-	-	-	-	-	-
Total	5,020	4,012	4,232	4,285	4,452	4,025
IPHC Regulatory Area	Recreational Limit Percent Attained					
	2013	2014	2015	2016	2017	2018
2A	121	117	105	109	98	96
2B	75	86	92	93	102	86
2C	102	109	96	93	103	90
3A	94	117	111	112	111	104
3B and 4	-	-	-	-	-	-
Total	-	-	-	-	-	-

Recreational Landings

IPHC Regulatory Area 2A (USA: Washington, Oregon, California)

The 2018 IPHC Regulatory Area 2A recreational allocation was 496,683 pounds (225.3 t) net weight and based on the Pacific Fishery Management Council's Catch Sharing Plan formula, which divides the overall fishery fishery limit among all sectors. The recreational allocation was further subdivided to seven subareas, after 50,000 pounds (22.7 t) was allocated to the incidental Pacific halibut catch in the commercial sablefish fishery in Washington. This subdivision resulted in 225,366 pounds (102.2 t) being allocated to Washington subareas, 229,730 pounds (104.2 t) to Oregon subareas. In addition, California received an allocation of 30,940 pounds (14.0 t). The IPHC Regulatory Area 2A recreational harvest totaled 464,924 pounds (210.9 t), 6% under the recreational allocation (Table 7).

Recreational fishery harvest seasons by subareas varied and were managed inseason with fisheries opening on 1 May.

IPHC Regulatory Area 2B (Canada: British Columbia)

IPHC Regulatory Area 2B operated under a 115 cm (45.3 inch) maximum size limit, and one Pacific halibut had to be less than 83 cm (32.7 inch) when attaining the two fish possession limit with an annual limit of six per licence holder. The IPHC Regulatory Area 2B fishery remains open.

British Columbia, Canada and Alaska, USA both have programs that allow recreational harvesters to land fish that is leased from commercial fishery quota share holders for the current season. In Canada, 16,648 pounds (7.6 t) were leased from the commercial quota fishery and landed as recreational harvest.

IPHC Regulatory Areas 2C, 3, and 4 (USA: Alaska)

A reverse slot limit allowing for the retention of Pacific halibut, if ≤ 38 inches (97 cm) or ≥ 80 inches (203 cm) (compared to ≤ 44 inches (112 cm) and ≥ 80 inches (203 cm) in 2017) in total length, was continued by the IPHC for the charter fishery in IPHC Regulatory Area 2C. In IPHC Regulatory Area 3A, charter anglers were allowed to retain two fish, but only one could exceed 28 inches in length, a four fish annual limit with a recording requirement, one trip per calendar day per charter permit, with no charter retention of Pacific halibut on Wednesdays throughout the season and 10 July, 17 July, 24 July, 31 July, 7 August and 14 August.

Similar to British Columbia (Canada), Alaska (USA) has programs that allow recreational harvesters to land fish that is leased from commercial fishery quota share holders for the current season. In IPHC Regulatory Areas 2C and 3A, 64,365 pounds (29.2 t) and 9,052 pounds (4.1 t), respectively, were leased from the commercial quota fisheries in those areas and landed as recreational harvest.

Recreational Discard Mortality

Pacific halibut discarded for any reason suffer some degree of discard mortality, and impacts more of the stock with the increasing use of size restrictions, such as reverse slot limits. Current year estimates from Contracting Parties' agencies of recreational discard mortality have been received from Alaska and Oregon in the USA, and British Columbia, Canada and are provided in Table 7.

SUBSISTENCE FISHERIES

Pacific halibut is taken throughout its range as subsistence harvest by several fisheries. Subsistence fisheries are non-commercial, customary, and traditional use of Pacific halibut for direct personal, family, or community consumption or sharing as food, or customary trade. The primary subsistence fisheries are the treaty Indian Ceremonial and Subsistence fishery in IPHC Regulatory Area 2A off northwest Washington State (USA), the First Nations Food, Social, and Ceremonial (FSC) fishery in British Columbia (Canada), and the subsistence fishery by rural residents and federally-recognized native tribes in Alaska (USA) documented via Subsistence Halibut Registration Certificates (SHARC).

The coastwide subsistence estimate for 2018 is 1,171,800 pounds (531.5 t). Subsistence harvest by IPHC Regulatory Areas from 2009 through 2018 is available in Table 8.

Table 8. Subsistence Pacific halibut fisheries removals (thousands of pounds net weight) by IPHC Regulatory Area, 2009-18.

IPHC Regulatory Area	Subsistence Fishery									
	2009	2010	2011	2012	2013[1]	2014	2015[1]	2016	2017[1]	2018[1]
2A	30.4	25.3	24.8	32.0	28.5	31.8	33.9	29.6	27.0	27.0
2B	405	405	405	405	405	405	405	405	405	405
2C	457.0	424.8	387.0	396.0	396.0	423.0	423.0	436.5	436.5	436.5
3A	328.5	312.7	266.1	253.5	253.5	241.4	241.4	222.5	222.5	222.5
3B	25.5	23.0	22.0	16.0	16.0	13.4	13.4	14.2	14.2	14.2
4A	33.5	14.5	13.6	9.5	9.5	7.7	7.7	8.1	8.1	8.1
4B	1.2	0.5	0.5	1.7	1.7	0.3	0.3	0.3	0.3	0.3
4C	6.3	10.9	1.6	1.2	1.2	3.4	3.4	4.3	4.3	4.3
4D	0.6	1.2	0.6	0.7	0.7	<0.1	<0.1	<0.1	<0.1	<0.1
4E	8.7	10.1	6.2	8.4	8.4	71.3	71.3	41.4	41.4	41.4
4D/4E (CDQ U32)	10.3	9.5	16.9	20.2	10.0	5.5	4.7	5.5	7.4	10.0
Total	1,307.0	1,237.5	1,144.3	1,144.2	1,130.5	1,202.8	1,204.1	1,167.3	1,166.7	1,169.3

[1] Alaska, USA estimates were carried over for the 2013 estimates from 2012, for the 2015 estimates from 2014 and for the 2017 and 2018 estimates from 2016, with the exception that 4D/4E subsistence harvest in the CDQ fishery were updated.

Estimated subsistence harvests by area

In the commercial Pacific halibut fisheries coastwide, the state and federal regulations require that take-home Pacific halibut caught during commercial fishing be recorded as part of the commercial fishery on the landing records (i.e. State fish tickets or Canadian validation records). This is consistent across areas, including the quota share fisheries in Canada and USA, and as part of fishing period limits and Pacific halibut ratios in the incidental fisheries in IPHC Regulatory Area 2A. Therefore, personal use fish or take-home fish within the commercial fisheries are accounted for as commercial catch and are not included here.

IPHC Regulatory Area 2A (USA: Washington, Oregon, California)

The Pacific Fishery Management Council's Catch Sharing Plan allocates the Pacific halibut fishery limit to commercial, recreational, and treaty Indian users in IPHC Regulatory Area 2A. The treaty tribal fishery limit is further sub-divided into commercial and ceremonial and subsistence (C&S) fisheries. The 2017 final estimate of C&S was 27,000 pounds (12.3 t) and this catch estimate became the 2018 C&S allocation. The estimate of the 2018 catch is not available so it is assumed the treaty tribal C&S allocation was fully harvested.

IPHC Regulatory Area 2B (Canada: British Columbia)

The source of Pacific halibut subsistence harvest in British Columbia is the First Nations FSC fishery. The IPHC receives some logbook and landing data for this harvest from the DFO but those data have not been adequate for the IPHC to make an independent estimate of the FSC fishery harvest. DFO estimated the First Nations FSC harvest to be 300,000 pounds (136.1 t) annually until 2006, and since 2007, the yearly estimate has been provided as 405,000 pounds (183.7 t).

IPHC Regulatory Areas 2C, 3, and 4 (USA: Alaska)

In 2003, the subsistence Pacific halibut fishery off Alaska was formally recognized by the North Pacific Fishery Management Council, and implemented by IPHC and NOAA Fisheries regulations. The fishery allows the customary and traditional use of Pacific halibut by rural residents and members of federally-recognized Alaska, USA native tribes who can retain Pacific halibut for non-commercial use, food, or customary trade. The NOAA Fisheries regulations define legal gear, number of hooks, and daily bag limits, and IPHC regulations set the fishing season. Prior to subsistence fishing, eligible persons registered with NOAA Fisheries Restricted Access Management to obtain a SHARC. The Division of Subsistence at ADFG was contracted by NOAA Fisheries to estimate the subsistence harvest in Alaska, USA through a data collection program. Yearly reports are available at http://www.fakr.noaa.gov/ram/ subsistence/halibut.htm. Each year, the data collection program included an annual voluntary survey of fishers conducted by mail or phone, with some onsite visits. The 2012 estimate has been carried forward for the 2013 estimate and the 2014 estimate has been used for 2014 through 2015; a new 2016 estimate is used for 2016 through 2018 (Fall and Koster 2017). The 2014 estimates are about 10% higher than in 2012, and are noticeably higher in IPHC Regulatory Area 4E. To collect the 2014 harvest estimates, the ADFG staff conducted face to face interviews in two of the major subsistence harvesting communities within IPHC Regulatory Area 4E rather than relying on mailed returns. Face to face interviews likely resulted in more realistic harvest estimates than the mail survey alone, so it is likely that the IPHC Regulatory Area 4E harvest estimates between 2009 through 2013 were low.

In addition to the SHARC harvest, IPHC regulations allow Pacific halibut less than 32 inches or 81.3 cm in fork length (also called U32) to be retained in the IPHC Regulatory Area 4D and 4E commercial Pacific halibut CDQ fishery, under an exemption requested by the North Pacific Fishery Management Council, as long as the fish are not sold or bartered. The exemption originally applied only to CDQ fisheries in IPHC Regulatory Area 4E in 1998 but was expanded in 2002 to also include IPHC Regulatory Area 4D. The CDQ organizations are required to report to the IPHC the amounts retained during their commercial fishing operations. This harvest is not included in the SHARC program estimate and is reported separately.

Reports for 2018 were received from three organizations: Bristol Bay Economic Development Corporation (BBEDC), Coastal Villages Regional Fund (CVRF), and Norton Sound Economic Development Corporation (NSEDC). The reports are summarized below, and the reported amounts of retained U32 Pacific halibut are shown in Table 9. A total of 9,989 pounds (4.5 t) of retained U32 Pacific halibut was reported by CDQ organizations, the highest amount since 2013. Generally, annual changes are a reflection of the amount of effort by the local small boat fleets and the availability of fish in their nearshore fisheries.

Table 9. Reported annual amount (pounds, net weight) of U32 (<32 inches in fork length) Pacific halibut retained by Community Development Quota harvesters fishing in IPHC Regulatory Areas 4D and 4E.

Organization	U32 CDQ Landings									
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
BBEDC	922	2,155	2,752	5,095	3,493	3,456	2,460	3,456	5,261	8,510
CVRF	4,277	3,924	9,909	10,424	5,250	963	0	0	0	0
NSEDC	6,060	3,438	4,206	4,668	1,290	1,114	2,206	2,001	2,119	1,479
Total	11,259	9,517	16,867	20,187	10,033	5,533	4,666	5,457	7,380	9,989

CDQ - Bristol Bay Economic Development Corporation (BBEDC)

BBEDC requires their fishers to record the lengths of retained U32 Pacific halibut in a separate log, which are tabulated by BBEDC at the conclusion of the season. The lengths were converted to weights using the IPHC length/weight relationship and summed to estimate the total retained U32 weight. Pacific halibut were landed by BBEDC vessels primarily at Togiak, with a lesser amount landed in Dillingham and a minor amount landed in Naknek. BBEDC reported 21 harvesters landed 801 U32 Pacific halibut (8,510 pounds; 3.9 t).

CDQ - Coastal Villages Regional Fund (CVRF)

CVRF reported that no Pacific halibut were landed by their fishers or received by their facilities.

CDQ - Norton Sound Economic Development Corporation (NSEDC)

NSEDC required their fishers to offload the U32 Pacific halibut for weighing. Ice was removed but the fish were not washed nor the heads removed. The U32 Pacific halibut were then returned to the harvester. NSEDC reported 147 U32 Pacific halibut weighing 1,479 pounds (0.7 t) were caught in the local CDQ fishery and landed at the Nome plant.

BYCATCH IN OTHER FISHERIES

Bycatch in other fisheries are incidentally caught fish by fisheries targeting other species and that cannot legally be retained. Bycatch mortality, or bycatch removals, refers only to those fish that subsequently die due to capture. The IPHC accounts for bycatch mortality in other fisheries by IPHC Regulatory Area and sector. Table 10 provides these estimates from 2009 through 2018.

Estimates of the bycatch mortality of Pacific halibut in other (non-Pacific halibut) fisheries in 2018 have been projected to total 6,057,000 pounds (2,747.4 t) net weight, representing an increase of approximately 13,000 pounds (5.9 t) from 2017 (Table 10). In IPHC Regulatory Area 2A, bycatch mortality is projected to have risen by 1%. Estimated bycatch in the IPHC Regulatory Area 2B bottom trawl fishery in 2018 is projected to have increased by15%. Bycatch trends were varied among Alaskan areas in the USA, with bycatch in IPHC Regulatory Areas 2C, 3A, 4B and 4CDE with the Closed Area projected to be up, while bycatch mortality in IPHC Regulatory Areas 3B and was projected to be down.

Table 10. Bycatch mortality estimates of Pacific halibut (thousands of pounds, net weight) by year, IPHC Regulatory Area, and fishery, for 2008-18. Estimates for 2018 are preliminary.[1]

IPHC Regulatory Area and Gear	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
AREA 2A										
Groundfish Trawl	415	299								
IFQ Bottom Trawl			52	60	54	44	55	55	55	56
Other Groundfish Trawl	1	3	2	2	4	3	1	1	2	1
Groundfish Pot			1	1	0	0	1	0	0	0
Hook & Line	97	45	35	53	8	53	23	40	72	72
Shrimp Trawl	0	0	0	1	1	0	0	1	0	0
Total	512	347	90	117	67	100	80	97	129	129
AREA 2B										
Groundfish Bottom Trawl	213	181	232	189	225	245	326	271	252	290
Total	213	181	232	189	225	245	326	271	251	290
AREA 2C										
Crab Pot	7	18	10	21	13	1	1	1	1	1
Groundfish Trawl	0	0	0	0	0	0	0	0	0	0
Hook & Line (non-IFQ)	5	4	3	8	8	8	12	15	5	3
Hook & Line (IFQ)	3	3	3	12	13	9	7	13	13	28
Chatham Str. Sablefish	8	8	8	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Clarence Str. Sablefish	25	25	25	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Total	48	58	49	41	34	17	19	29	17	32
AREA 3A										
Scallop Dredge	9	14	12	10	12	24	24	24	24	24
Groundfish Trawl	2,141	2,030	2,232	1,422	1,336	1,680	1,792	1,493	1,230	1,520
Hook & Line (non-IFQ)	197	111	92	238	216	155	223	210	127	61
Hook & Line (IFQ)	119	119	119	25	31	16	33	26	35	46
Groundfish Pot	5	12	23	29	34	12	25	40	10	3
Pr Wm Sd Sablefish	10	10	10	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Total	2,481	2,296	2,488	1,724	1,630	1,888	2,098	1,793	1,426	1,654
AREA 3B										
Crab Pot	0	0	0	0	0	0	0	0	0	0
Scallop Dredge	4	0	5	4	8	14	0	0	0	0
Groundfish Trawl	865	676	806	989	733	809	537	708	767	430
Hook & Line (non-IFQ)	256	269	172	105	88	115	96	124	93	18
Hook & Line (IFQ)	116	116	116	24	14	18	15	8	17	13
Groundfish Pot	7	36	21	20	44	18	10	31	13	2
Total	1,247	1,097	1,120	1,142	887	974	658	871	890	463

continued…

Table 10 continued. Bycatch mortality estimates of Pacific halibut (thousands of pounds, net weight) by year, IPHC Regulatory Area, and fishery, for 2008-18. Estimates for 2018 are preliminary.[1]

IPHC Regulatory Area and Gear	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
AREA 4A										
Scallop Dredge	0	0	0	0	0	0	0	0	0	0
Crab Pot	5	22	14	12	27	0	0	0	0	0
Groundfish Trawl	1,315	800	789	1,314	606	615	483	466	304	235
Hook & Line (non-IFQ)	220	213	145	130	204	160	149	99	89	35
Hook & Line (IFQ)	15	15	15	5	4	3	3	2	2	2
Groundfish Pot	2	7	8	10	32	27	7	5	5	3
Total	1,557	1,058	971	1,472	873	805	642	572	400	275
AREA 4B										
Crab Pot	0	0	1	0	3	0	0	0	0	0
Groundfish Trawl	299	371	402	215	116	101	202	137	193	210
Hook & Line (non-IFQ)	119	65	32	27	6	24	20	5	15	13
Hook & Line (IFQ)	40	40	40	12	10	5	2	2	0	2
Groundfish Pot	1	1	1	1	5	2	0	0	0	2
Total	459	477	476	255	140	132	223	144	207	227
AREA 4CDE+CA										
Scallop Dredge	0	0	0	0	0	0	0	0	0	0
Crab Pot	33	63	49	29	29	0	37	37	37	37
Groundfish Trawl	3,160	3,429	2,496	3,458	4,110	4,205	3,003	2,895	2,441	2,760
Hook & Line (non-IFQ)	821	684	472	768	668	538	384	311	268	190
Hook & Line (IFQ)	5	5	5	1	151	11	0	0	0	0
Groundfish Pot	1	1	2	4	18	13	2	2	2	0
Total	4,021	4,182	3,024	4,260	4,977	4,767	3,425	3,245	2,747	2,987
AREA 4 Subtotal										
Scallop Dredge	1	0	0	0	0	0	0	0	0	0
Crab Pot	39	85	65	41	59	0	37	37	37	37
Groundfish Trawl	4,774	4,600	3,687	4,987	4,832	4,921	3,687	3,499	2,938	3,205
Hook & Line (non-IFQ)	1,160	962	649	925	878	722	552	415	370	238
Hook & Line (IFQ)	60	60	60	18	165	19	5	3	2	4
Groundfish Pot	4	9	11	15	55	42	8	7	7	5
Total	6,037	5,717	4,472	5,987	5,989	5,704	4,290	3,961	3,354	3,489
GRAND TOTAL	**10,539**	**9,695**	**8,450**	**9,202**	**8,832**	**8,927**	**7,470**	**7,021**	**6,070**	**6,057**

[1]Note that some totals may not sum precisely due to rounding.

Estimating Bycatch Mortality

Bycatch of Pacific halibut is estimated because not all fisheries have 100% monitoring and not all Pacific halibut that are discarded are assumed to die. Agencies estimate the amount of bycatch that will not survive, called discard mortality.

The IPHC relies upon information supplied by observer programs run by domestic agencies for bycatch estimates in most fisheries. Non-IPHC research survey information is used to generate estimates of bycatch in the few cases where fishery observations are unavailable. The NOAA-Fisheries operates observer programs off the USA West Coast and Alaska, which monitor the major groundfish fisheries. Data collected by those programs are used to estimate bycatch. Trawl fisheries off British Columbia (BC: Canada) are comprehensively monitored and bycatch information is provided to IPHC by DFO.

Off the USA West Coast, an individual quota (IQ) program was implemented in 2011 for the domestic groundfish trawl fisheries. The program is quite similar to the program for the BC trawl fishery, in that it contains an individual bycatch quota component for managing and reducing Pacific halibut bycatch mortality. Fishery monitoring is required at 100% coverage levels, so all vessels carry an observer to record the vessel's catch. Bycatch is reported to IPHC by NOAA Fisheries (Jannot et al. 2018). Bycatch estimates for the shrimp trawl fishery have been provided by Oregon Department of Fish and Wildlife (ODFW) staff from examinations of Pacific halibut bycatch during gear experiments. Updated estimates were provided by ODFW in 2011.

The amount of information varies for fisheries conducted off BC, Canada. For the trawl fishery, bycatch is managed with an individual bycatch quota program implemented by DFO in 1996. Fishery observers sample the catch on each bottom trawler, collecting data to estimate bycatch and discard mortality. Bycatch in other fisheries, such as the shrimp trawl, sablefish pot, and rockfish hook-and-line fisheries, was largely unknown until the inception of the Integrated Fisheries Management Program in 2006. The program has requirements for full accounting and accountability of all bycatch, and includes 100% at-sea monitoring, either by human observers or electronic monitoring. Estimates of trawl bycatch were provided by DFO staff at the Pacific Biological Station, based on data collected by observers. Reporting of bycatch from the non-trawl programs is being developed with DFO staff and will be provided in future reports.

Estimates of bycatch off Alaska, USA in federally managed fisheries were provided by the NOAA Fisheries Alaska Region. Several fishery programs have a mandatory 100% monitoring requirement, including the CGOARP, the BSAI CDQ fisheries, the AFA pollock cooperatives, and the BSAI A80 fishery cooperatives. NOAA Fisheries Alaska Fisheries Science Center's Annual Deployment Plan (ADP) provides the scientific guidelines which determine how vessels not involved in these full coverage programs are chosen for monitoring, including vessels in the directed Pacific halibut IFQ fishery. Additional details about the ADP can be found in NOAA Fisheries (2017). The NOAA Fisheries projections were provided in metric tons, round weight, and were converted to pounds net weight using net weight = round weight x 0.75 * 2,204.62.

Estimates of Pacific halibut bycatch in scallop dredge and crab fisheries are obtained from the ADFG, but not on an annual basis. The catch estimates are based on fishery data collected by on-board observers. The most recent estimates of 2016 were rolled forward for 2017 and 2018. Work is underway to develop an annual approach to updating these data.

Bycatch Mortality by Area

IPHC Regulatory Area 2A (USA: Washington, Oregon, California)

Groundfish fisheries off Washington, Oregon, and California are managed by the NOAA Fisheries, following advice and recommendations developed by the Pacific Fishery Management Council. The final estimate of bycatch mortality in IPHC Regulatory Area 2A was 129,000 pounds (58.5 t) (Table 10). As in prior years, the bottom trawl fishery and hook-and-line fishery for sablefish were responsible for the bulk of the bycatch mortality. Pacific halibut bycatch in the trawl IFQ fishery (also called trawl catch shares) in this area are capped at 100,000 pounds (45 t) (net weight) of O32 Pacific halibut. For 2018, the bycatch mortality projection for the trawl IFQ fishery was 56,000 pounds (25.4 t) of Pacific halibut.

IPHC Regulatory Area 2B (Canada: British Columbia)

In Canada, Pacific halibut bycatch in trawl fisheries are capped at 750,000 pounds net weight (453.6 t round weight) by DFO. Non-trawl bycatch is handled under an IFQ system within the directed Pacific halibut fishery cap.

For 2018, bycatch mortality in the BC bottom trawl fishery was projected to be 290,000 pounds (131.5 t) (Table 10). The reported bycatch mortality data were complete through September. Projections for the full calendar year 2018 were made by extrapolating to the full 12 months.

IPHC Regulatory Areas 2C, 3, and 4 (USA: Alaska)

Groundfish fisheries in Alaska, USA are managed by the NOAA Fisheries, following advice and recommendations developed by the North Pacific Fishery Management Council. The North Pacific Fishery Management Council sets limits on the amount of Pacific halibut bycatch mortality which is allowed to occur annually in the groundfish fisheries, known as the Prohibited Species Catch (PSC) limits. These PSC limits are published in metric tons (t) (round weight) and are shown in Table 11, with their equivalent net weight (millions of pound). If a fishery's PSC limit is reached, the fishery is closed. Certain gear types, e.g., pots or jigs, are exempted from closures due to their low bycatch properties and to encourage their use. Bycatch mortality projected estimates for Alaskan areas in the USA in Table 10 were provided by NOAA Fisheries; projections were made for the full year based on fishery data through 13 October 2018.

Table 11. Pacific halibut bycatch limits in the Alaska, USA groundfish fishery 2009-18**.**

Geographical Area	**Sector**	**Bycatch Limits** (metric tons (t), round weight)									
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Gulf of Alaska	Trawl	2,000	2,000	2,000	2,000	1,973	1,848	1,759	1,706	1,706	1,706
	Fixed Gears	300	300	300	300	300	279	270	266	266	266
Bering Sea/	Trawl	3,625	3,625	3,575	3,525	3,525	3,525	3,525	2,805	2,805	2,805
Aleutian Islands	Fixed Gears	900	900	900	900	900	900	900	710	710	710
Geographical Area	**Sector**	**Bycatch Limits** (millions of pounds, net weight)									
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Gulf of Alaska	Trawl	3.30	3.30	3.30	3.30	3.26	3.06	2.91	2.82	2.82	2.82
	Fixed Gears	0.50	0.50	0.50	0.50	0.50	0.46	0.45	0.44	0.44	0.44
Bering Sea/	Trawl	6.00	6.00	5.90	5.80	5.80	5.80	5.80	4.64	4.64	4.64
Aleutian Islands	Fixed Gears	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.17	1.17	1.17

IPHC Regulatory Area 2C (USA: Southeast Alaska)

For the federal waters of IPHC Regulatory Area 2C, only bycatch by hook-and-line vessels fishing in the outside waters were reported by NOAA Fisheries. These vessels are primarily

targeting Pacific cod and rockfish (*Sebastes* spp.) in open access fisheries, and sablefish in the IFQ fishery. In aggregate, these fisheries are projected to result in 32,000 pounds (14.5 t) of bycatch mortality in 2018.

Fisheries occurring within state waters and resulting in Pacific halibut bycatch include pot fisheries for red and golden king crab, and tanner crab. Information is provided periodically by ADFG, and the estimate was again rolled forward for 2018.

IPHC Regulatory Area 3 (USA: Eastern, Central and Western Gulf of Alaska)

IPHC Regulatory Area 3 is comprised of Areas 3A and 3B. IPHC tracks bycatch for each IPHC Regulatory Area due to assessment and stock management needs, while groundfish fisheries operate throughout both areas. Trawl fisheries are responsible for the majority of the bycatch in these IPHC Regulatory Areas, with hook-and-line fisheries a distant second (Table 10) for a projected total of 2,117,000 pounds (960.3 t). State-managed crab and scallop fisheries are also known to take Pacific halibut as bycatch, but at low levels.

IPHC Regulatory Area 3 remains the area where bycatch mortality is estimated most poorly. Observer coverage for most fisheries is relatively low. Tendering, loopholes in trip cancelling, and safety considerations likely result in observed trips not being representative of all trips (observed and unobserved) in many regards (e.g. duration, species composition, etc.. This, plus low coverage, lead to increased uncertainty in these bycatch estimates and to potential for bias.

IPHC Regulatory Area 4 (USA: Bering Sea and Aleutian Islands)

Bycatch mortality for all IPHC Regulatory Areas within Area 4 was projected at 3,489,000 pounds (1,582.6 t), with the groundfish trawl fishery being most of that at 3,205,000 pounds (1,453.8 t).

Hook-and-line fishery bycatch mortality was projected at 242,000 pounds (109.8 t). Pacific cod is the major fishery in this IPHC Regulatory Area with Pacific halibut bycatch, which is conducted in the late winter/early spring and late summer. Almost all of the vessels are required to have 100% observer coverage because of the vessel's size and requirements of their fishery cooperative; very few small vessels fish Pacific cod in this IPHC Regulatory Area. Because of this high level of observer coverage, bycatch estimates for this and other IPHC Regulatory Area 4 fisheries are considered reliable.

Pots are used to fish for Pacific cod and sablefish and fish very selectively. Bycatch rates are quite low and survival is relatively high. Annual bycatch mortality estimates are typically low, usually less than 15,000 pounds (6.8 t).

Within the Bering Sea, bycatch mortality estimates have typically been the highest in IPHC Regulatory Area 4CDE (Table 10). This is due to the groundfish fisheries which operate in the area, i.e., those for flatfish.

IPHC FISHERY-INDEPENDENT SETLINE SURVEY AND OTHER RESEARCH

The IPHC's FISS provides catch information and biological data on Pacific halibut (*Hippoglossus stenolepis)* that are independently collected from the commercial fishery. Approximately 826,000 pounds (375 t) of Pacific halibut were landed from the FISS in 2018 with the amount landed from each IPHC Regulatory Area documented in Table 1. For additional information on the FISS see IPHC-2018-IM094-06.

RECOMMENDATION/S

That the Commission:

1) **NOTE** paper IPHC-2018-IM094-05 which provides preliminary fishery statistics from fisheries catching Pacific halibut during 2018, including the status of removals compared to fishery limits implemented by the Contracting Parties of the Commission.

REFERENCES

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APPENDICES

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