

## Appendix 3.F Observer Coverage and Sampling of the Sablefish Stock

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### Introduction

The goals of this report are to present how much of the sablefish stock catch was observed by the North Pacific Observer Program, how many biological samples were collected by observers and at what rates (samples/mt catch) by Fishery Management Plan Subareas and gear types since observer restructuring, in 2013. Total catch estimates are from the Alaska Regional Office Catch Accounting System (CAS), based on landings, fishery observations, and other data sources. Fishery observations and biological samples are collected by the North Pacific Groundfish Observer Program and the Alaska Fisheries Science Center (AFSC) Fishery Monitoring and Analysis program (FMA). A description of the observer strata is in the “Additional Information” section at the end of this document. More details are available in the North Pacific Groundfish Observer Program Annual Deployment Plans and Annual Reports produced by the AFSC, FMA Division and are available online. All CAS and observer data were queried through the Alaska Fisheries Information Network database (AKFIN.org). Data is presented through the prior year because the count of samples from the North Pacific Observer Program are delayed while catch data is available closer to real time.

### Results

#### Summary

(Note that prior to 2017 gear catch and samples were only from the Bering Sea and Aleutian Islands (BSAI).)

- Catch in pot gear has increased in all areas, as well as non-pelagic trawl gear (NPT) in the BSAI and Central Gulf of Alaska and pelagic trawl gear (PTR) over a short period in the Bering Sea (BS) (Table 1).
- Coverage rates (observed catch/catch) by at-sea observers is highest in the BSAI and Western Gulf of Alaska (WG) and lowest in the CGOA, WY, and East Yakutat/Southeast (EY) (Table 2). However, electronic monitoring (EM) is utilized more in these areas, particularly EY, and total coverage rates are similar to other areas. Rates are not stable.
- Length collections are highest in the CGOA and were anomalously high in the BS from 2020-2022 in PTR gear (Tables 3 and 4, Figure 6, Figure 7). Otoliths were not collected from PTR caught fish.
- The number of lengths collected has increased in all areas except WY (Tables 3 and 4, Figure 6).
- Length sampling rates (lengths/catch) have overall been on the decline for at least 6 years, in hook-and-line (HAL), pot, and NPT gears. For sampling rate by area, there are downward trends in all areas except EY (Figure 10).
- The number of otoliths has decreased in the CGOA and WY (Tables 3 and 5, Figure 8).

- Otolith sampling rates (otoliths/catch) are on a decline in all gears and all areas except the eastern GOA (WY and EY), where rates are irregular (Figure 11). Overall, declines are steeper than for length coverage rates (Figure 10).
- As catch in pot gear increased, the number and proportion of biological samples from pot catch increased dramatically (Tables 1, 3, and 5, Figures 6, 7, 8, 9).
- Proportionally, the majority of lengths came from at-sea collections, except in BS PTR gear (Figure 12 and 13).
- The EM coverage rate (catch with EM/catch) and the length sampling rate (lengths/catch) do not have the same trend in the majority of years.

## Catch

As a base for reference, the total catch of the stock by area and gear is reported in Figure 1 and Table 1. Note that pot catch prior to 2017 is only in the BSAI. The most notable change in the BSAI was higher catch in trawl and pot gear from 2020-2022, with a 513% increase from average in PTR in 2020, solely in the BS. Catch in pots has increased rapidly in Alaska, particularly with the legalization of pot gear in the Gulf of Alaska (GOA) in 2017. Over the same period HAL catch has continued to decrease in the GOA. Non-pelagic trawl (NPT) catch has increased in the CGOA from an average of 745 mt from 2013-2016 to 1,672 mt from 2016-2022. There were more discards in years when there was higher catch in trawl gears.

## ODDS Strata and Actual Coverage

Before a trip has been given a monitoring status, first it is assigned to an observer stratum in the Observer Deployment and Declare System (ODDS). Figure 2 summarizes how much catch was from trips assigned to each observer stratum in ODDS, including partial coverage, electronic monitoring (EM) partial coverage, full coverage, or no coverage. Figure 3 shows the same data, but as the percent of total catch in each observer strata category. All trips are assigned to a stratum in ODDS; however, this is not how much catch was actually observed. After strata assignment in ODDS, trips are selected for observing and the resulting catch can be attributed to one of these strata. Not all catch in an ODDS stratum with coverage are observed. For example, for partial coverage a portion of trips and associated catch is observed and so some of the catch in ODDS assigned to partial coverage will be categorized as no coverage when evaluating the resulting fishery catch. Figure 4 shows the actual coverage category for the catch: no coverage, at-sea observers, or EM. Table 2 and Figure 5 display the percent of the catch that was in each coverage category. PTR and NPT gears do not have any EM coverage currently. Note that for Figure 5, proportions for each cell are calculated using the catch by coverage type divided by the total catch in each area/grid cell annually. In other words, the proportions are the values in each column by area and gear scaled to sum to 1.

In ODDS much of the catch was in the partial coverage stratum. In the CGOA, BS, and AI there was also catch from NPT and PTR that had been classified as full coverage in ODDS (Figures 2 and 3). There was little catch with no coverage in the ODDS system (i.e., was not in a stratum with coverage). A large portion of the catch was put into the partial EM stratum in ODDS in the GOA, WY, and EY and some in the WGOA (Figure 3).

After trips have been completed and the actual coverage strata is known (i.e., partial strata trips in ODDS are either in the coverage or no coverage strata), we can evaluate the actual fishery coverage. Overall, at-sea coverage was highest in the BSAI, but EM is absent or negligible (Table 2, Figures 4 and 5). For HAL

gear the at-sea annual observer rate is generally highest in the BS and the WGOA (28-77%, 18-54%, respectively, over the past five years) (Table 2, Figure 5). In the CGOA, WY, and EY it is much lower, at 5-15%. EM is utilized more in these areas, particularly EY, bringing the total catch coverage rate up by 3-12% per year. For pot gear there was very high at-sea coverage in the AI (37-86% in the past 5 years) and was substantial in the BS (12-32%) and the WGOA in recent years. Note in Table 2 the average includes the whole time series, starting in 2013.

## Biological Samples

Lengths and otoliths are collected at-sea and in ports and the rate of collection depends on the gear and area (see the North Pacific Groundfish Observer Program Annual Deployment Plans). A summary of collected lengths and otoliths and rates of sampling, as samples per mt of total catch (referred to as samples/catch), are in Table 3. The total counts of fish sampled for lengths by area and gear are in Table 4 and Figure 6. The proportion fish sampled for lengths by gear in each area are in Figure 7. The same data are available for otoliths in Table 4 and Figure 8 and 9.

The number of lengths has increased from a low of 18,480 in 2016 to 34,408 in 2022 and the number of otoliths from a low of 3,020 in 2017 to 3,841 in 2022 (Tables 4 and 5). Overall, the number of samples collected is highest in the CGOA (9,970 in 2022); on average 40% or 43% of the lengths and otoliths are collected there, respectively, with a peak of 50-51% in 2015. As catch has increased, sample sizes of lengths have increased in all areas except WY (Tables 3 and 4, Figure 6). Unlike lengths, the number of sampled otoliths decreased in CGOA (Tables 3, Figure 5 and 8). In recent years catch in pots has increased rapidly and likewise the number and proportion of lengths and otoliths from pot gear increased (Tables 1 and 3, Figures 6, 7, 8, and 9).

The absolute number of lengths and otoliths do not show the whole picture; the sampling rate indicates how well each gear/area are being sampled (number of samples/total catch for each gear; referred to as samples/catch) (Table 3, Figure 10 and 11 right sides). Specific to gear types, sampling rates of lengths for all of Alaska only increased in PTR; this occurred when there were high catches in the BS (Figure 10, right side). However, otoliths were not collected from fish in PTR gear (9 and 11). HAL lengths/catch have been on a decline since 2014; otoliths/catch show the same trend, but the decline is steeper (Figures 10 and 11). Despite higher absolute numbers and catches, sampling rates in NPT have been in decline through the time series and pot sampling rates dropped off in 2019. Conversely, catch in pots in the GOA increased rapidly (Table 1, Figure 1).

For sampling rates by area, not gear, there were steep declines in the AI starting in 2016 (Figure 10 and 11, left sides), even though the absolute number of lengths and otoliths collected increased (Tables 3, 4, and 5, Figures 6 and 8). This coincides with steep shift in catch from HAL to pot and NPT gears (Table 1, Figure 1). In the BS lengths/catch decreased slowly in recent years; however, starting in 2019 the otolith sampling rate decreased on a knife edge (Figures 10 and 11). Now that PTR catches have decreased in the BS, otoliths/mt have started to increase, but nowhere close to past sampling rates. In the WGOA total length and otolith sample sizes were stable, with an increase in 2022 (Figures 6 and 8). This was dissimilar to length and otolith sampling rates, which started decreasing in 2017 when pot gear was legalized. Like in other areas, sampling rates of lengths and otoliths in the CGOA declined starting in 2017, with otoliths/catch decreasing more steeply than lengths/catch (Figures 6, 8, 10, 11). Unlike other areas, in the eastern GOA (WY and EY) the sampling rates have been irregular throughout the time series and there appears to be an impact of COVID-19 in 2020, which can also be seen in the total counts (Figure 6, 8, 10, and 11).

The EM coverage rate in fixed gear (catch with EM/fixed gear catch) and the rate of length sampling (lengths/catch) can be used to evaluate if EM coverage shares the same trends with sampling rate. In Figure 14 the proportion of catch observed using EM is plotted alongside the sampling rate of lengths, for each area. Lengths are not collected when EM is used. There are few years when there is a trend.

## Tables

Table 3.F.1. Total sablefish catch (mt) by area, year, and gear. Gear types include non-pelagic trawl (NPT), pot (POT), hook and line (HAL), pelagic trawl (PTR), or jig (JIG). Areas include the Aleutian Islands (AI), Bering Sea (BS), Western Gulf of Alaska (WGOA), Central Gulf of Alaska (CGOA), West Yakutat (WY), and East Yakutat (EY).

Area	Year	NPT	POT	HAL	PTR	JIG	Sum
AI	2013	58	87	937			1,082
AI	2014	26	160	627			813
AI	2015	15	12	394			422
AI	2016	30	21	289			340
AI	2017	129	269	191			588
AI	2018	179	286	199			664
AI	2019	241	204	218			663
AI	2020	695	398	139	<1		1,232
AI	2021	774	570	234	1		1,578
AI	2022	1,115	911	204			2,230
BS	2013	133	352	150	<1		635
BS	2014	34	164	115	<1		314
BS	2015	17	108	85	<1		210
BS	2016	239	158	116	18		531
BS	2017	588	365	106	91		1,150
BS	2018	623	370	148	395		1,536
BS	2019	1,283	419	237	1,223		3,162
BS	2020	1,071	582	280	3,396		5,329
BS	2021	1,396	1,361	333	1,080		4,169
BS	2022	2,120	2,926	218	250		5,514
WGOA	2013	13	<1	1,345	<1		1,358
WGOA	2014	61	<1	1,134	<1		1,194
WGOA	2015	35	<1	954	8		998
WGOA	2016	38	1	1,004	9		1,052
WGOA	2017	57	226	889	10		1,181
WGOA	2018	218	365	801	6		1,389
WGOA	2019	277	459	754	44		1,533
WGOA	2020	175	1,082	196	8		1,462
WGOA	2021	180	1,665	148	1		1,994
WGOA	2022	225	2,590	212	1		3,028
CGOA	2013	659		4,527	<1		5,187
CGOA	2014	736	2	3,982	16		4,736
CGOA	2015	780	2	3,822	22		4,626

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Area	Year	NPT	POT	HAL	PTR	JIG	Sum
CGOA	2016	803	8	3,361	23	<1	4,195
CGOA	2017	1,192	443	3,203	1		4,838
CGOA	2018	2,114	549	3,105	10		5,778
CGOA	2019	1,944	1,619	2,701	16		6,280
CGOA	2020	2,026	2,608	1,369	38		6,041
CGOA	2021	1,288	5,310	710	16		7,325
CGOA	2022	1,472	5,900	715	77		8,165
WY	2013	173		1,929	1		2,102
WY	2014	152		1,519	<1		1,671
WY	2015	212		1,654			1,866
WY	2016	177		1,474			1,651
WY	2017	206	92	1,396			1,694
WY	2018	236	45	1,581	<1		1,861
WY	2019	126	168	1,508	<1		1,802
WY	2020	83	561	1,190	<1		1,835
WY	2021	117	1,536	677	<1		2,329
WY	2022	105	2,161	483			2,750
EY	2013			3,246			3,246
EY	2014			2,817			2,817
EY	2015			2,811			2,811
EY	2016			2,455			2,455
EY	2017		137	2,678			2,816
EY	2018		163	2,856			3,019
EY	2019		262	2,851			3,113
EY	2020		499	2,638			3,137
EY	2021		1,330	2,542			3,872
EY	2022		2,998	2,224			5,221

Table 3.F.2. The proportion of sablefish catch observed by observers (Obs) or electronic monitoring (EM) by area and gear for the most recent five years and the average proportions since. The remainder of the catch had no observer coverage. Gear types include pelagic trawl (PTR), non-pelagic trawl (NPT), pot (POT), or hook and line (HAL). Areas include the Aleutian Islands (AI), Bering Sea (BS), Western Gulf of Alaska (WGOA), Central Gulf of Alaska (CGOA), West Yakutat (WY), and East Yakutat (EY).

Area	Year	PTR	NPT	POT	POT	HAL	HAL
		% Obs	% Obs	% EM	% Obs	% EM	% Obs
AI	2018		100		73	3	4
AI	2019		100		37		1
AI	2020	100	100	0	86	1	13
AI	2021	100	100		80	0	25
AI	2022		100		84	0	12
AI	Avg	100	100	0	67	0	26
BS	2018	100	100		32	0	77
BS	2019	99	100	0	12	0	55
BS	2020	100	100	0	24	0	76
BS	2021	100	99	1	15	0	28
BS	2022	100	100	2	22	2	69
BS	Avg	100	100	1	19	0	52
WGOA	2018	18	73		9	1	22
WGOA	2019	30	99		1	2	33
WGOA	2020	82	100	8	6	4	18
WGOA	2021	84	100	4	27	8	29
WGOA	2022	84	100	7	36	6	54
WGOA	Avg	31	95	5	24	1	23
CGOA	2018	18	44	1	15	7	12
CGOA	2019	86	70	5	8	9	15
CGOA	2020	83	61	5	8	6	13
CGOA	2021	70	96	6	17	4	10
CGOA	2022	95	98	9	13	3	11
CGOA	Avg	62	74	6	13	3	17
WY	2018	74	100	10	36	6	11
WY	2019	96	100	4	17	7	14
WY	2020		100	9	0	5	6
WY	2021		100	10	23	8	5
WY	2022		100	9	13	5	7
WY	Avg	23	100	9	15	3	14

Table 3.F.2. The proportion of sablefish catch observed by observers (Obs) or electronic monitoring (EM) by area and gear for the most recent five years and the average proportions since. The remainder of the catch had no observer coverage. Gear types include pelagic trawl (PTR), non-pelagic trawl (NPT), pot (POT), or hook and line (HAL). Areas include the Aleutian Islands (AI), Bering Sea (BS), Western Gulf of Alaska (WGOA), Central Gulf of Alaska (CGOA), West Yakutat (WY), and East Yakutat (EY).

Area	Year	PTR	NPT	POT	POT	HAL	HAL
		% Obs	% Obs	% EM	% Obs	% EM	% Obs
EY	2018				5	7	9
EY	2019			16	14	12	10
EY	2020			8	6	12	4
EY	2021			7	11	10	15
EY	2022			7	13	12	9
EY	Avg			7	12	6	12

Table 3.F.3. The total catch in mt for each area and year, the number of individual fish lengths (len) and otoliths (oto) collected, and the rate of length and otolith sampling, as sampling per mt of catch (Len/mt and Oto/mt), for the five most recent years and the average from 2013-2022. Areas include the Aleutian Islands (AI), Bering Sea (BS), Western Gulf of Alaska (WGOA), Central Gulf of Alaska (CGOA), West Yakutat (WY), and East Yakutat (EY).

Area	Year	Catch	Len	Len/mt	Oto	Oto/mt
AI	2018	664	1,878	2.83	281	0.42
AI	2019	663	610	0.92	90	0.14
AI	2020	1,232	1,553	1.26	222	0.18
AI	2021	1,578	4,326	2.74	609	0.39
AI	2022	2,230	5,089	2.28	600	0.27
AI	Avg	961	2,997	3.12	478	0.50
BS	2018	1,536	3,098	2.02	473	0.31
BS	2019	3,162	1,408	0.45	159	0.05
BS	2020	5,329	9,987	1.87	254	0.05
BS	2021	4,169	6,783	1.63	267	0.06
BS	2022	5,514	7,596	1.38	634	0.11
BS	Avg	2,255	3,398	1.51	245	0.11
WGOA	2018	1,389	1,876	1.35	332	0.24
WGOA	2019	1,533	2,901	1.89	382	0.25
WGOA	2020	1,462	1,520	1.04	169	0.12
WGOA	2021	1,994	1,433	0.72	244	0.12
WGOA	2022	3,028	4,479	1.48	587	0.19
WGOA	Avg	1,519	2,466	1.62	401	0.26
CGOA	2018	5,778	8,862	1.53	1,444	0.25
CGOA	2019	6,280	8,851	1.41	1,251	0.20
CGOA	2020	6,041	6,298	1.04	1,065	0.18
CGOA	2021	7,325	10,396	1.42	1,045	0.14
CGOA	2022	8,165	9,970	1.22	1,028	0.13
CGOA	Avg	5,717	9,578	1.68	1,451	0.25
WY	2018	1,861	2,316	1.24	395	0.21
WY	2019	1,802	3,607	2.00	507	0.28
WY	2020	1,835	1,055	0.57	157	0.09
WY	2021	2,329	3,339	1.43	523	0.22
WY	2022	2,750	1,663	0.60	241	0.09
WY	Avg	1,956	2,282	1.17	343	0.18



Table 3.F.3. The total catch in mt for each area and year, the number of individual fish lengths (len) and otoliths (oto) collected, and the rate of length and otolith sampling, as sampling per mt of catch (Len/mt and Oto/mt), for the five most recent years and the average from 2013-2022. Areas include the Aleutian Islands (AI), Bering Sea (BS), Western Gulf of Alaska (WGOA), Central Gulf of Alaska (CGOA), West Yakutat (WY), and East Yakutat (EY).

Area	Year	Catch	Len	Len/mt	Oto	Oto/mt
EY	2018	3,019	2,894	0.96	355	0.12
EY	2019	3,113	3,642	1.17	542	0.17
EY	2020	3,137	1,811	0.58	285	0.09
EY	2021	3,872	7,114	1.84	846	0.22
EY	2022	5,221	5,611	1.07	751	0.14
EY	Avg	3,251	3,723	1.15	511	0.16

Table 3.F.4. Count of sablefish lengths measured at-sea and in port by observers by area, year, and gear. Gear types include non-pelagic trawl (NPT), hook and line (HAL), pot (POT), and pelagic trawl (PTR). Areas include the Aleutian Islands (AI), Bering Sea (BS), Western Gulf of Alaska (WGOA), Central Gulf of Alaska (CGOA), West Yakutat (WY), and East Yakutat (EY).

Area	Year	NPT	HAL	POT	PTR	Sum
AI	2013	5	4,152			4,157
AI	2014		4,879			4,879
AI	2015		3,728	94		3,822
AI	2016		1,470	234		1,704
AI	2017	85	46	1,825		1,956
AI	2018	17	214	1,647		1,878
AI	2019	10	21	579		610
AI	2020	172	40	1,341		1,553
AI	2021	321	139	3,866		4,326
AI	2022	317	30	4,742		5,089
BS	2013	142	257	305		704
BS	2014		111	308		419
BS	2015		39	332		371
BS	2016	339	24	750		1,113
BS	2017	705	235	1,562		2,502
BS	2018	1,526	305	1,267		3,098
BS	2019	523	319	560	6	1,408
BS	2020	488	593	1,280	7,626	9,987
BS	2021	949	90	992	4,752	6,783
BS	2022	1,872	73	3,188	2,463	7,596
WGOA	2013	26	3,653			3,679
WGOA	2014		3,066			3,066
WGOA	2015	20	2,210			2,230
WGOA	2016		2,251		4	2,255
WGOA	2017		972	247		1,219
WGOA	2018	49	1,491	336		1,876
WGOA	2019	135	2,728	38		2,901
WGOA	2020	123	267	1,130		1,520
WGOA	2021	48	146	1,239		1,433
WGOA	2022	70	187	4,222		4,479

Table 3.F.4. Count of sablefish lengths measured at-sea and in port by observers by area, year, and gear. Gear types include non-pelagic trawl (NPT), hook and line (HAL), pot (POT), and pelagic trawl (PTR). Areas include the Aleutian Islands (AI), Bering Sea (BS), Western Gulf of Alaska (WGOA), Central Gulf of Alaska (CGOA), West Yakutat (WY), and East Yakutat (EY).

Area	Year	NPT	HAL	POT	PTR	Sum
CGOA	2013	2,696	5,787			8,483
CGOA	2014	2,376	10,318			12,694
CGOA	2015	2,079	11,281		163	13,523
CGOA	2016	1,338	7,786		9	9,133
CGOA	2017	2,406	4,810	289	60	7,565
CGOA	2018	2,245	4,923	1,692	2	8,862
CGOA	2019	1,980	5,486	1,264	121	8,851
CGOA	2020	1,673	1,987	2,638		6,298
CGOA	2021	1,540	437	8,344	75	10,396
CGOA	2022	2,095	347	7,505	23	9,970
WY	2013	82	1,513			1,595
WY	2014	55	2,095			2,150
WY	2015	104	3,494			3,598
WY	2016	81	1,648			1,729
WY	2017	71	1,636	64		1,771
WY	2018	205	1,842	269		2,316
WY	2019	49	3,199	359		3,607
WY	2020	67	988			1,055
WY	2021	78	221	3,040		3,339
WY	2022	44	287	1,332		1,663
EY	2013		2,561			2,561
EY	2014		3,630			3,630
EY	2015		3,507			3,507
EY	2016		2,546			2,546
EY	2017		3,485	426		3,911
EY	2018		2,773	121		2,894
EY	2019		3,084	558		3,642
EY	2020		1,444	367		1,811
EY	2021		3,978	3,136		7,114
EY	2022		1,194	4,417		5,611

Table 3.F.5. Count of sablefish otoliths collected at-sea in port by observers by area, year, and gear. Gear types include non-pelagic trawl (NPT), hook and line (HAL), pot (POT), or pelagic trawl (PTR). Areas include the Aleutian Islands (AI), Bering Sea (BS), Western Gulf of Alaska (WGOA), Central Gulf of Alaska (CGOA), West Yakutat (WY), and East Yakutat (EY).

Area	Year	NPT	HAL	POT	PTR	Sum
AI	2013	3	1,061			1,064
AI	2014		651			651
AI	2015		665	3		668
AI	2016		289	35		324
AI	2017	16	5	252		273
AI	2018	1	40	240		281
AI	2019	3	7	80		90
AI	2020	20	6	196		222
AI	2021	50	17	542		609
AI	2022	43	6	551		600
BS	2013	30	41	85		156
BS	2014		34	2		36
BS	2015		10	19		29
BS	2016	26	5	81		112
BS	2017	111	42	179		332
BS	2018	232	67	174		473
BS	2019	79	46	34		159
BS	2020	60	91	101	2	254
BS	2021	137	16	114		267
BS	2022	266	6	362		634
WGOA	2013	8	669			677
WGOA	2014		571			571
WGOA	2015	3	306			309
WGOA	2016		537		3	540
WGOA	2017		152	44		196
WGOA	2018	6	297	29		332
WGOA	2019	23	357	2		382
WGOA	2020	14	41	114		169
WGOA	2021	9	15	220		244
WGOA	2022	12	25	550		587

Table 3.F.5. Count of sablefish otoliths collected at-sea in port by observers by area, year, and gear. Gear types include non-pelagic trawl (NPT), hook and line (HAL), pot (POT), or pelagic trawl (PTR). Areas include the Aleutian Islands (AI), Bering Sea (BS), Western Gulf of Alaska (WGOA), Central Gulf of Alaska (CGOA), West Yakutat (WY), and East Yakutat (EY).

Area	Year	NPT	HAL	POT	PTR	Sum
CGOA	2013	485	922			1,407
CGOA	2014	420	1,582			2,002
CGOA	2015	406	1,696		35	2,137
CGOA	2016	292	1,454			1,746
CGOA	2017	465	847	60	9	1,381
CGOA	2018	444	731	267	2	1,444
CGOA	2019	315	744	191	1	1,251
CGOA	2020	240	306	519		1,065
CGOA	2021	232	39	765	9	1,045
CGOA	2022	341	52	629	6	1,028
WY	2013	12	190			202
WY	2014	6	344			350
WY	2015	18	495			513
WY	2016	11	293			304
WY	2017	12	206	20		238
WY	2018	35	317	43		395
WY	2019	9	442	56		507
WY	2020	9	148			157
WY	2021	15	32	476		523
WY	2022	6	9	226		241
EY	2013		256			256
EY	2014		530			530
EY	2015		564			564
EY	2016		379			379
EY	2017		509	91		600
EY	2018		323	32		355
EY	2019		452	90		542
EY	2020		215	70		285
EY	2021		458	388		846
EY	2022		162	589		751

## Figures

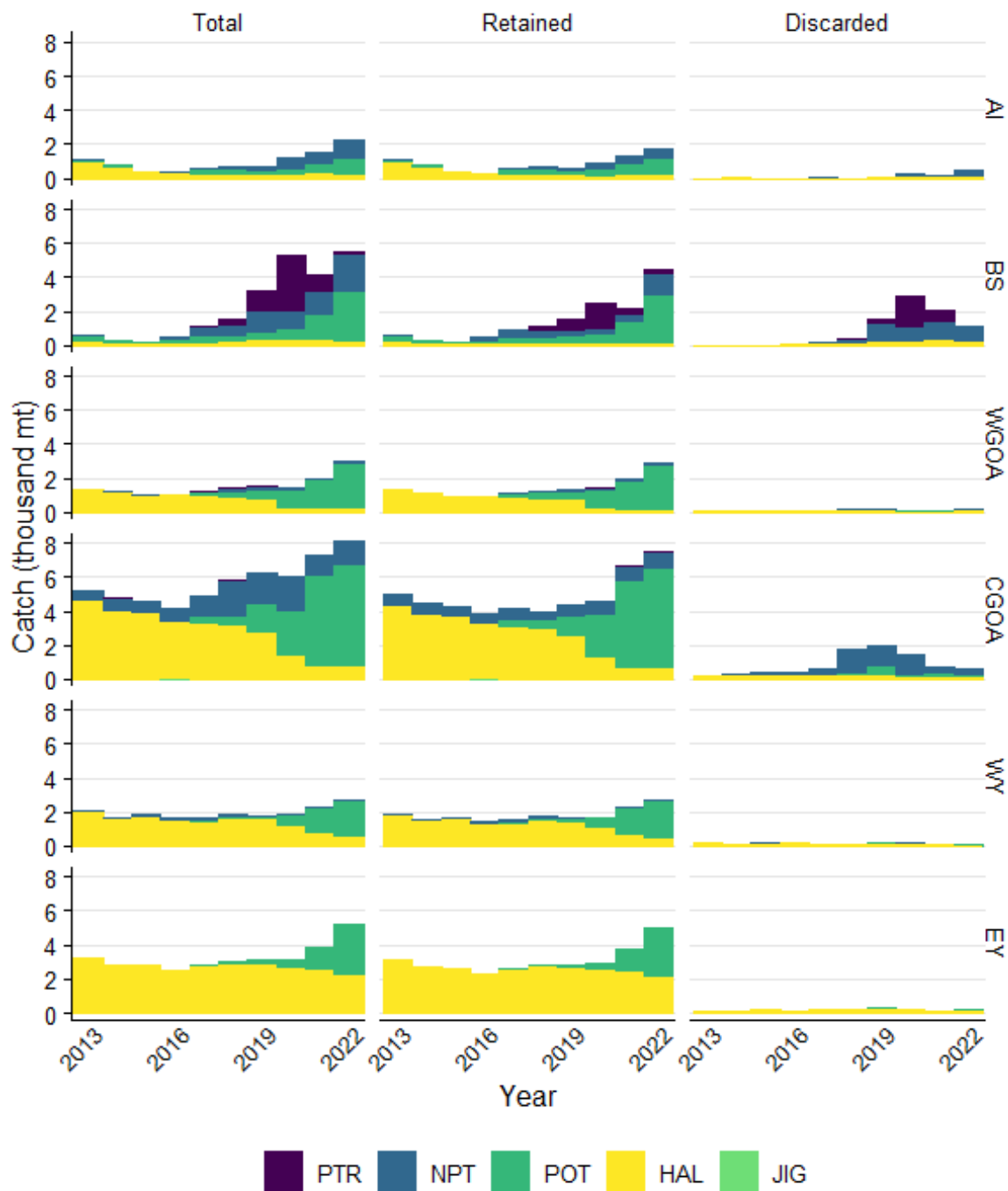


Figure 3.F.1. Sablefish catch by gear type that was either the total of retained and discarded, retained, or discarded by management area. Gear types include pelagic trawl (PTR), non-pelagic trawl (NPT), pot (POT), or hook and line (HAL). Areas include the Aleutian Islands (AI), Bering Sea (BS), Western Gulf of Alaska (WGOA), Central Gulf of Alaska (CGOA), West Yakutat (WY), and East Yakutat (EY).

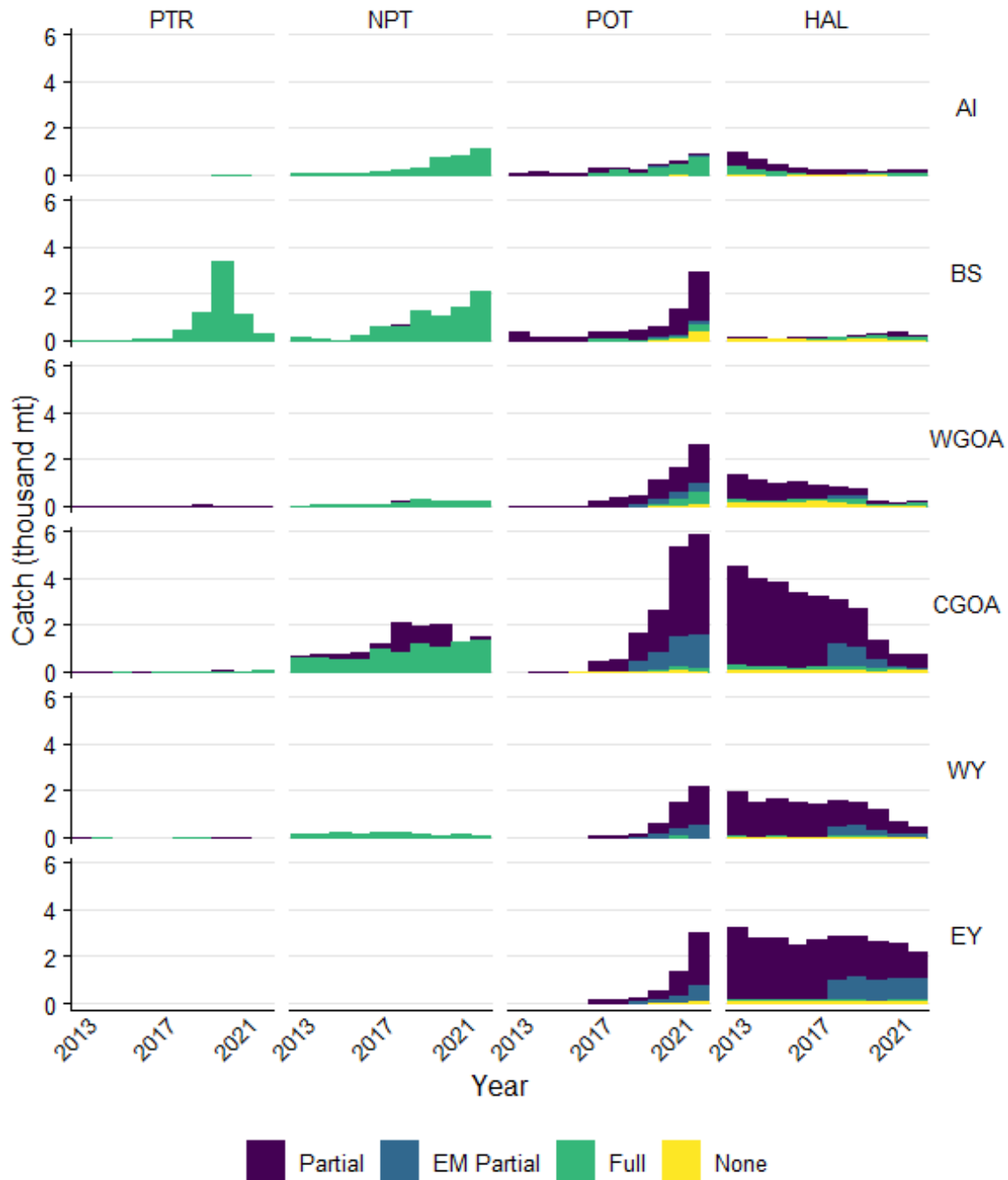


Figure 3.F.2. Sablefish catch in each observer coverage category in the Observer Deploy and Declare System (ODDS), including fixed gear electronic monitoring (EM). This catch was not necessarily observed. Gear types include pelagic trawl (PTR), non-pelagic trawl (NPT), pot (POT), or hook and line (HAL). Areas include the Aleutian Islands (AI), Bering Sea (BS), Western Gulf of Alaska (WGOA), Central Gulf of Alaska (CGOA), West Yakutat (WY), and East Yakutat (EY).

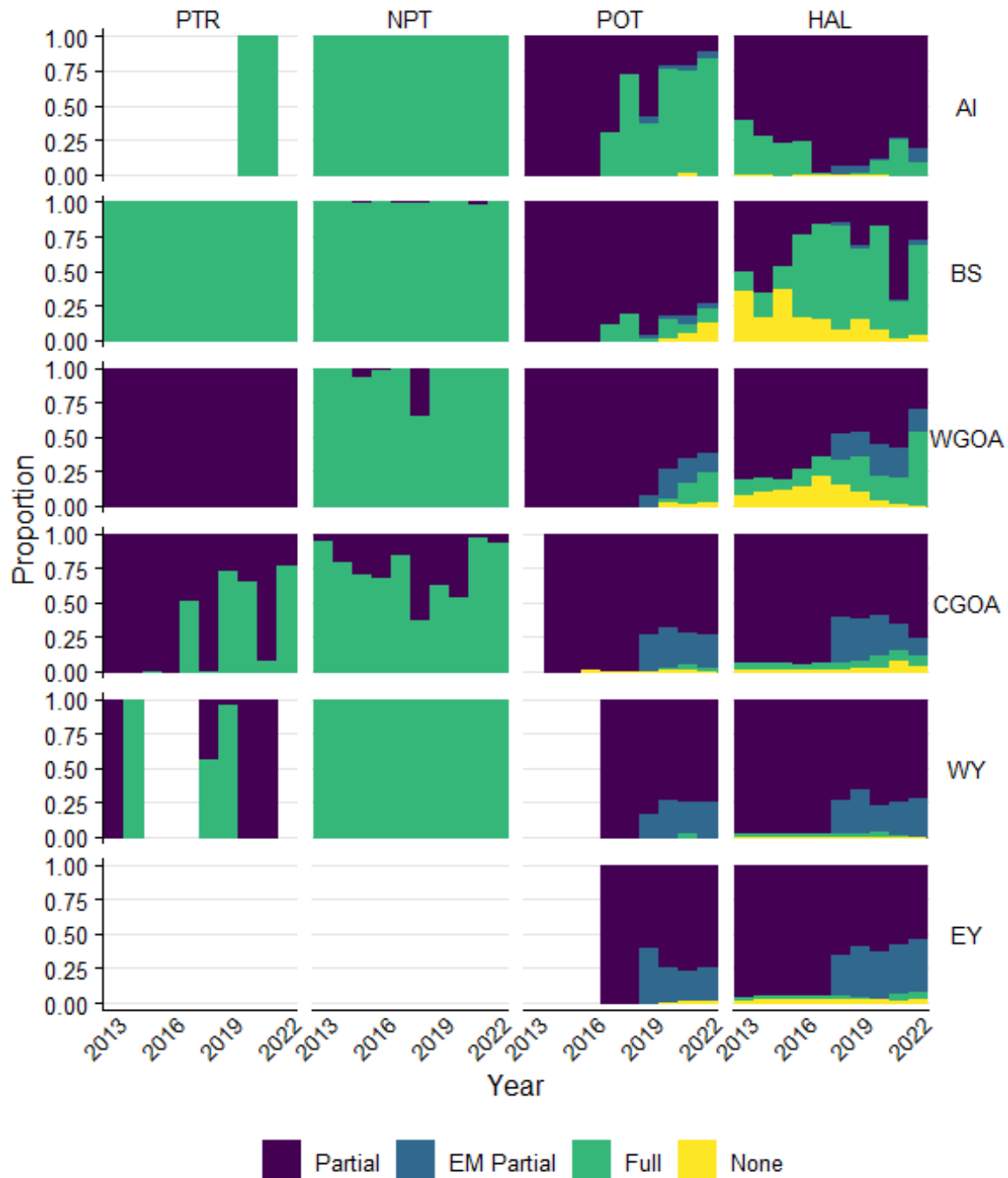


Figure 3.F.3. Utilizing sablefish catch data, the proportions of catch in each observer coverage category in the Observer Deploy and Declare System (ODDS) for each area, gear, and year, including fixed gear electronic monitoring (EM). I.e., the catch for each area, gear, and year is scaled to 1. This catch was not necessarily observed. Gear types include pelagic trawl (PTR), non-pelagic trawl (NPT), pot (POT), or hook and line (HAL). Areas include the Aleutian Islands (AI), Bering Sea (BS), Western Gulf of Alaska (WGOA), Central Gulf of Alaska (CGOA), West Yakutat (WY), and East Yakutat (EY).



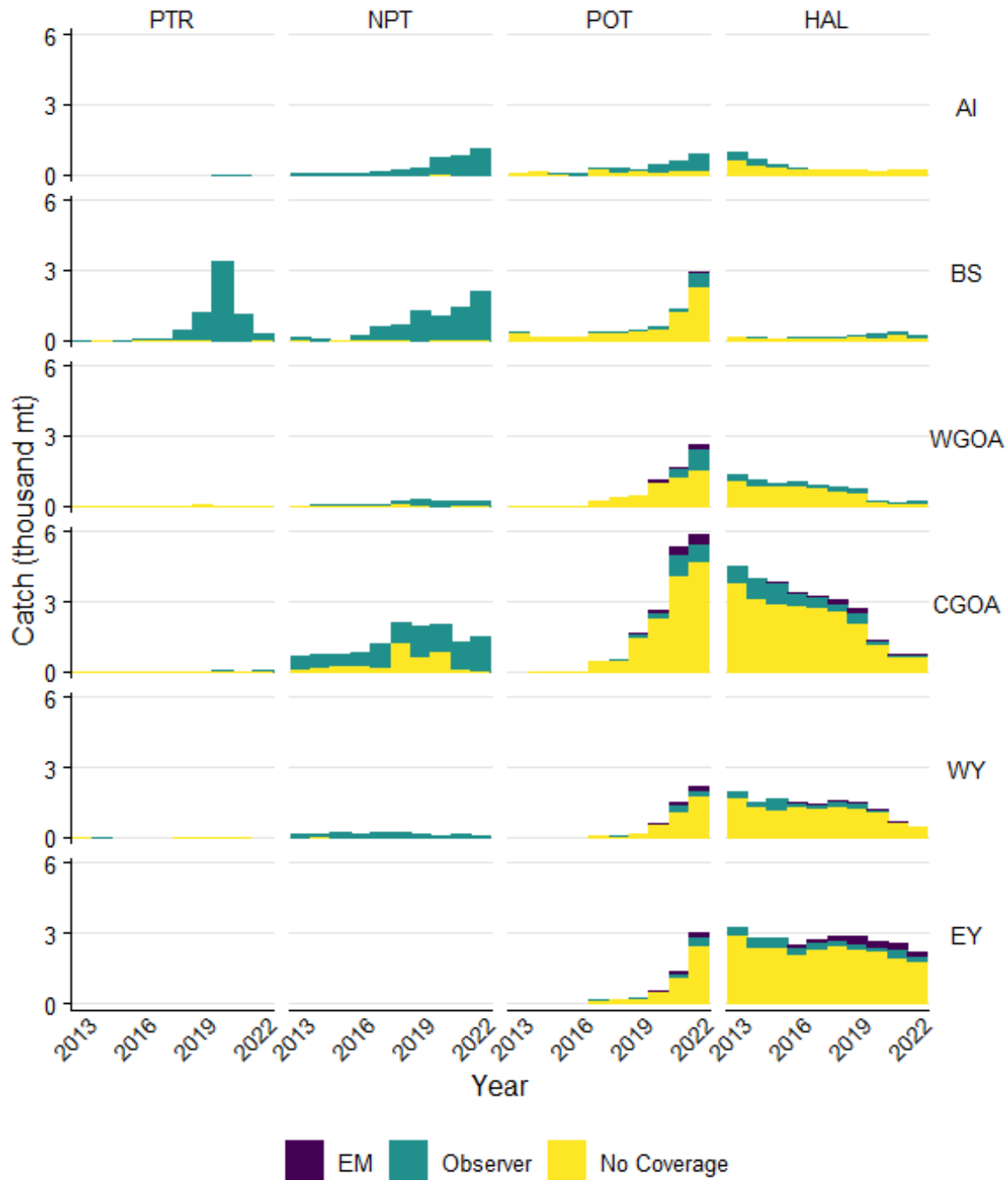


Figure 3.F.4. Sablefish catch by gear type either observed by electronic monitoring (EM), observers, or no coverage. Biological samples were not taken whenever an observer was present. Gear types include pelagic trawl (PTR), non-pelagic trawl (NPT), pot (POT), or hook and line (HAL). Areas include the Aleutian Islands (AI), Bering Sea (BS), Western Gulf of Alaska (WGOA), Central Gulf of Alaska (CGOA), West Yakutat (WY), and East Yakutat (EY).

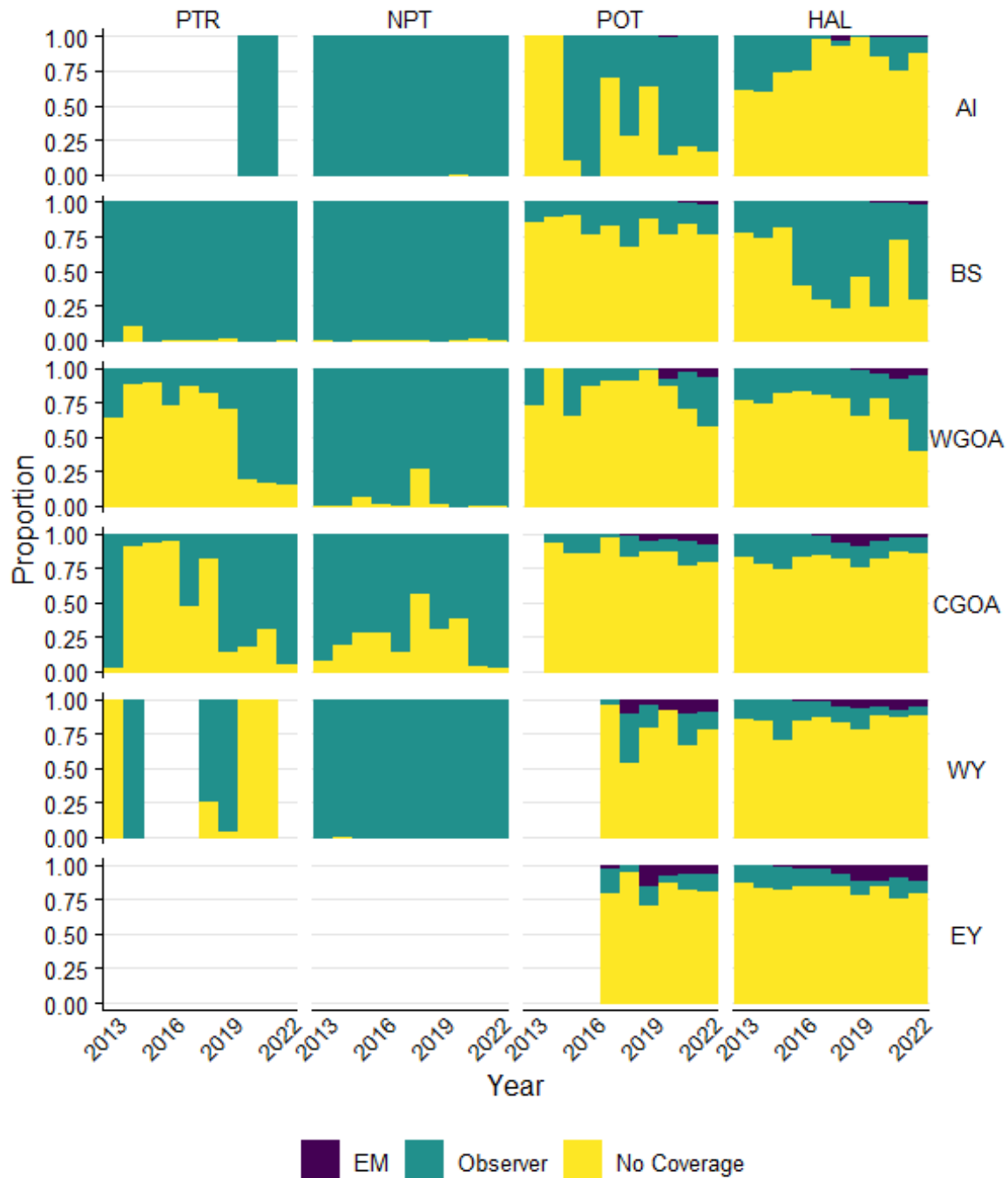


Figure 3.F.5. Utilizing sablefish catch data, the proportions of catch in each observer coverage category in the Observer Deploy and Declare System (ODDS) for each area, gear, and year, including fixed gear electronic monitoring (EM). I.e., the catch for each area, gear, and year is scaled to 1. This catch was not necessarily observed. Gear types include pelagic trawl (PTR), non-pelagic trawl (NPT), pot (POT), or hook and line (HAL). Areas include the Aleutian Islands (AI), Bering Sea (BS), Western Gulf of Alaska (WGOA), Central Gulf of Alaska (CGOA), West Yakutat (WY), and East Yakutat (EY).



Figure 3.F.6. The number of total lengths measured by observers by year, gear, and area. Gear types include pelagic trawl (PTR), non-pelagic trawl (NPT), pot (POT), or hook and line (HAL). Areas include the Aleutian Islands (AI), Bering Sea (BS), Western Gulf of Alaska (WGOA), Central Gulf of Alaska (CGOA), West Yakutat (WY), and East Yakutat (EY).

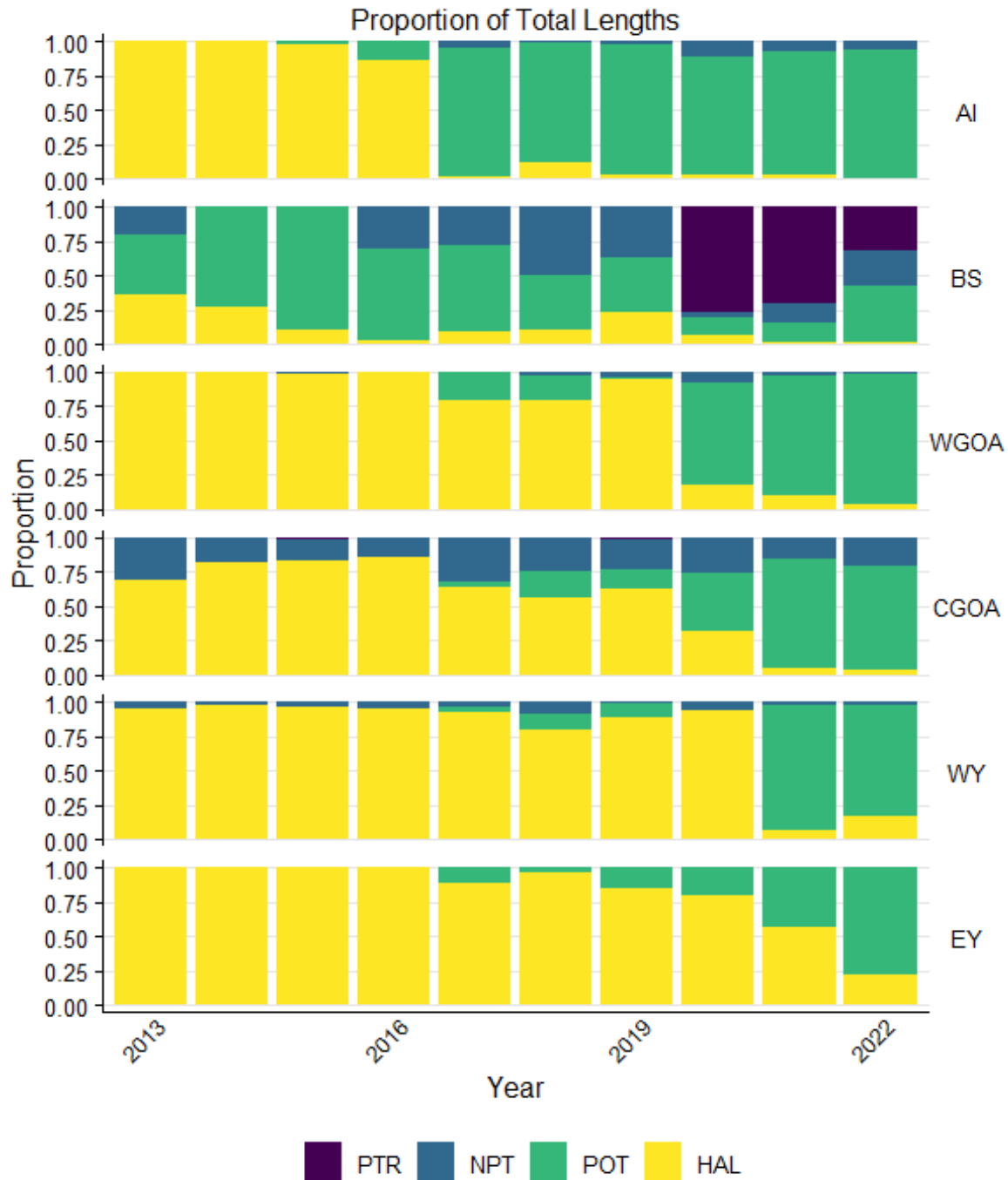


Figure 3.F.7. Utilizing the number of lengths measured by observers, the proportion of lengths by gear, area, and year. I.e., the number of lengths measured for each area, gear, and year are scaled to 1. Gear types include pelagic trawl (PTR), non-pelagic trawl (NPT), pot (POT), or hook and line (HAL). Areas include the Aleutian Islands (AI), Bering Sea (BS), Western Gulf of Alaska (WGOA), Central Gulf of Alaska (CGOA), West Yakutat (WY), and East Yakutat (EY).

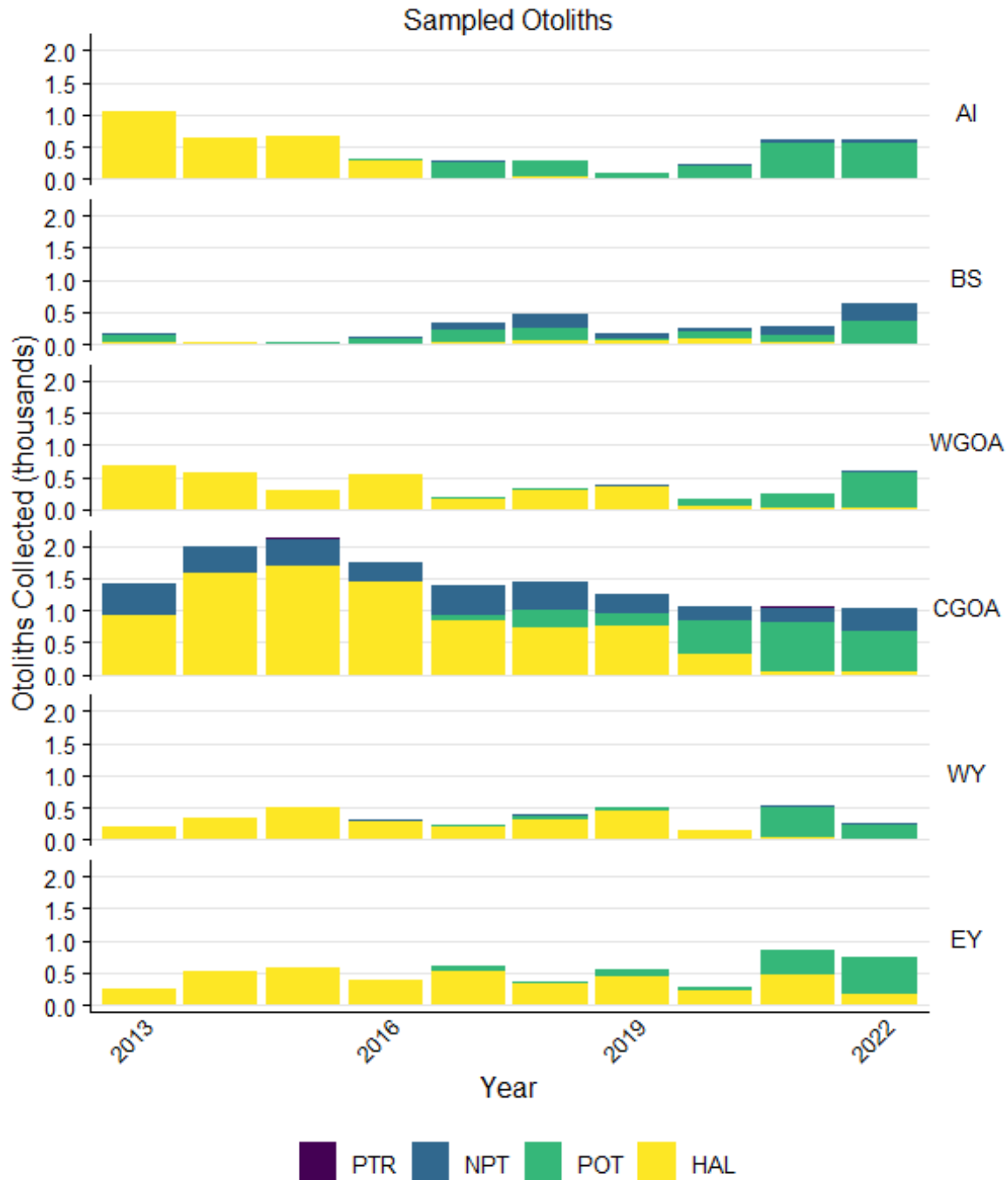


Figure 3.F.8. The number of otoliths collected by observers by gear and area. Gear types include pelagic trawl (PTR), non-pelagic trawl (NPT), pot (POT), or hook and line (HAL). Areas include the Aleutian Islands (AI), Bering Sea (BS), Western Gulf of Alaska (WGOA), Central Gulf of Alaska (CGOA), West Yakutat (WY), and East Yakutat (EY).

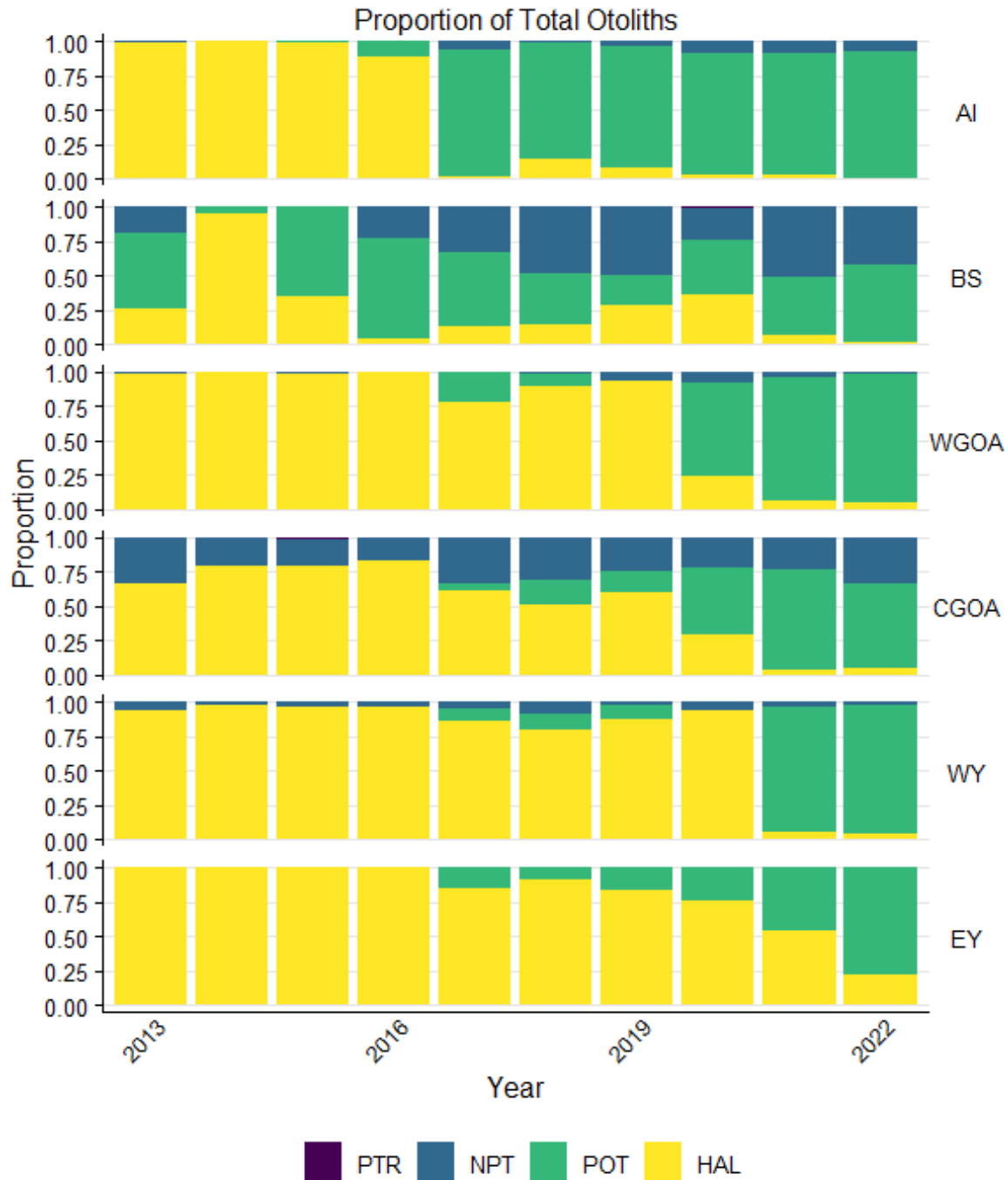


Figure 3.F.9. Utilizing the count of otoliths, the proportion of otoliths collected by observers by gear, area, and year. I.e., the number of otoliths collected for each area, gear, and year are scaled to 1. Gear types include pelagic trawl (PTR), non-pelagic trawl (NPT), pot (POT), or hook and line (HAL). Areas include the Aleutian Islands (AI), Bering Sea (BS), Western Gulf of Alaska (WGOA), Central Gulf of Alaska (CGOA), West Yakutat (WY), and East Yakutat (EY).

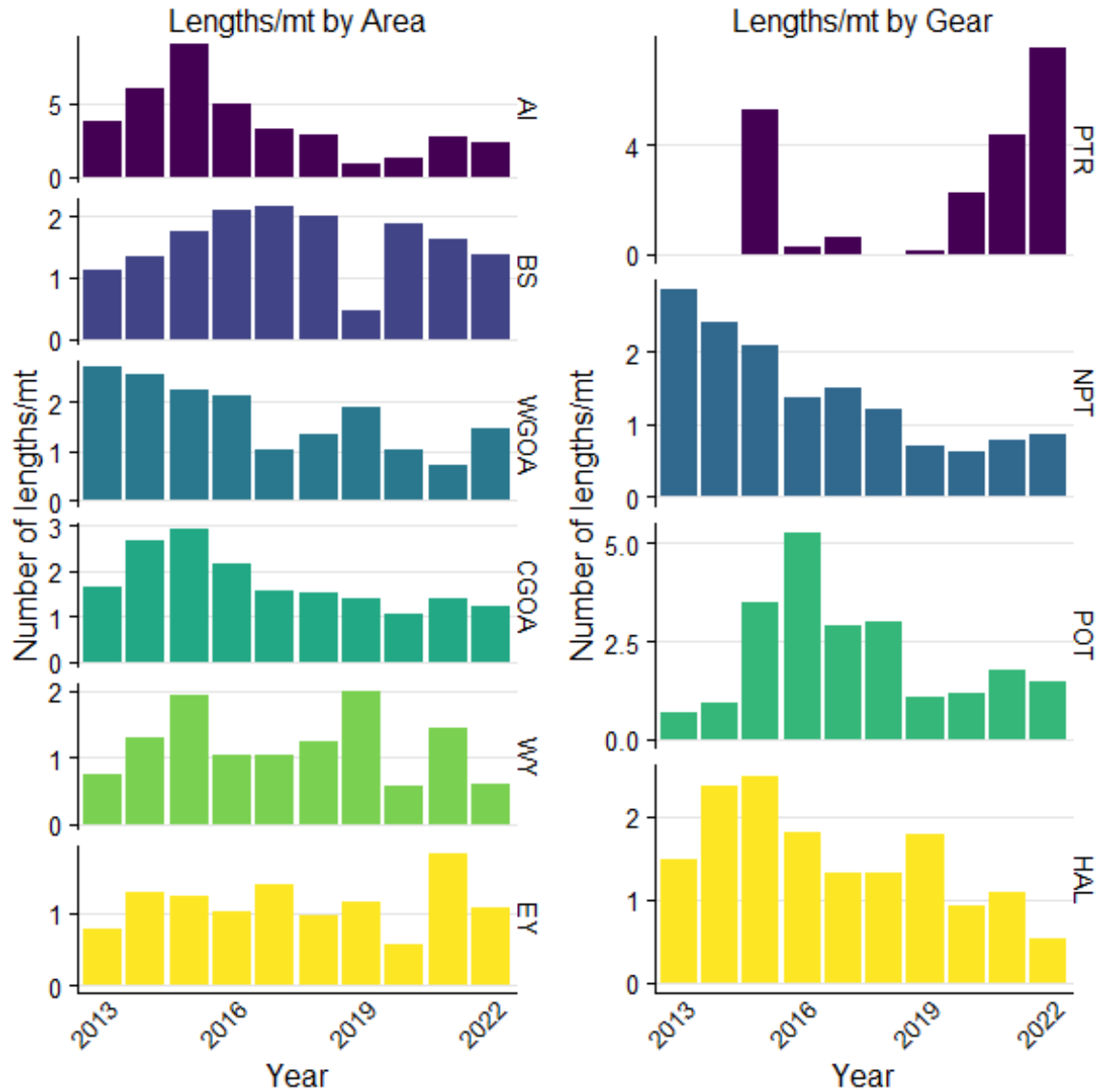


Figure 3.F.10. The number of sablefish lengths collected per mt of total catch by management area (left) or by gear (right). Note differences in scales. Gear types include pelagic trawl (PTR), non-pelagic trawl (NPT), pot (POT), or hook and line (HAL). Areas include the Aleutian Islands (AI), Bering Sea (BS), Western Gulf of Alaska (WGOA), Central Gulf of Alaska (CGOA), West Yakutat (WY), and East Yakutat (EY).

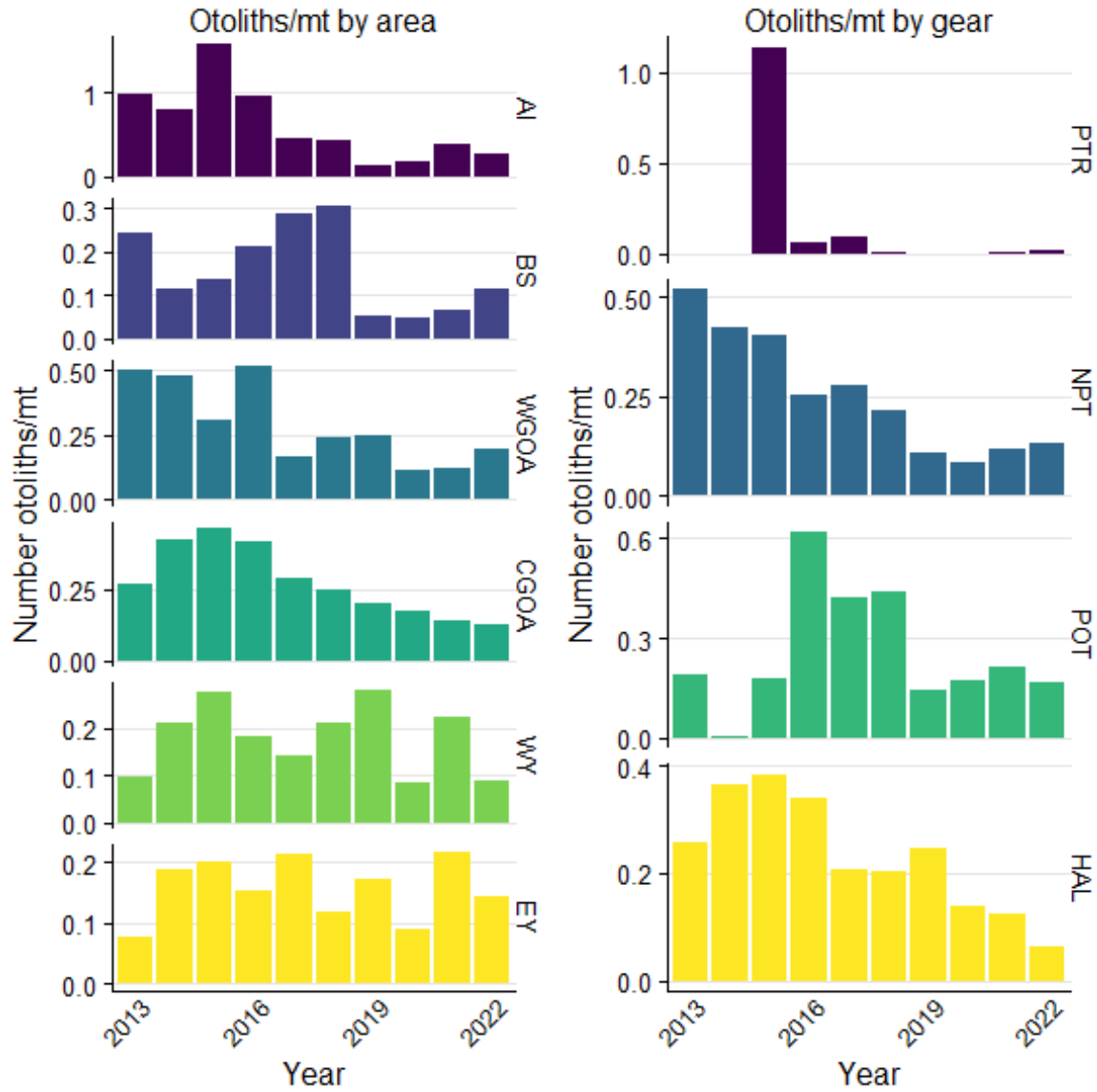


Figure 3.F.11. The number of sablefish otoliths collected per mt of total catch by management area (left) or by gear (right). Note differences in scales. Gear types include pelagic trawl (PTR), non-pelagic trawl (NPT), pot (POT), or hook and line (HAL). Areas include the Aleutian Islands (AI), Bering Sea (BS), Western Gulf of Alaska (WGOA), Central Gulf of Alaska (CGOA), West Yakutat (WY), and East Yakutat (EY).



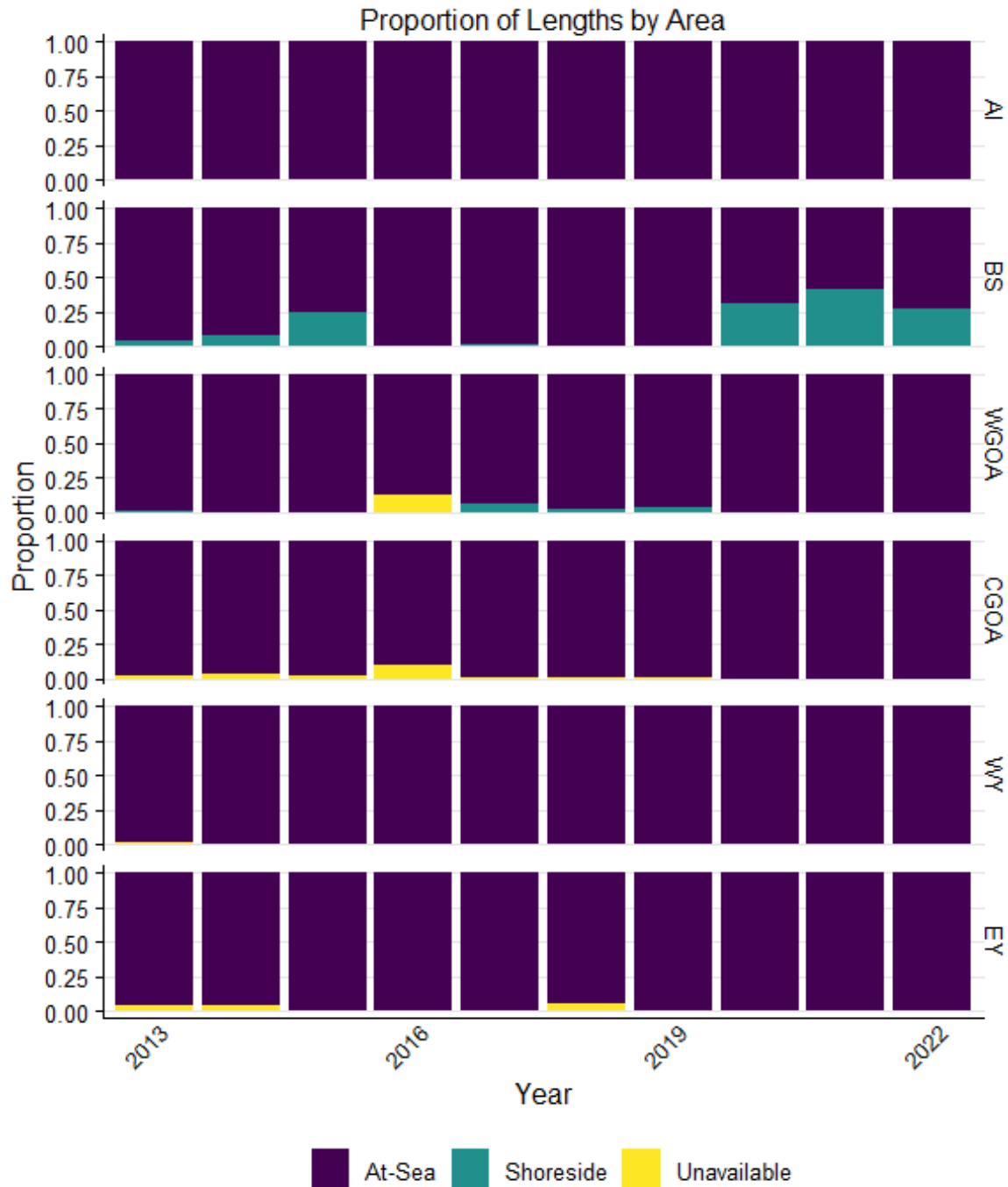


Figure 3.F.12. The proportion of sablefish lengths that were measured at-sea versus in ports by observers by area. At-sea sampling provides haul level information, while shoreside is lower resolution trip level information. Gear types include pelagic trawl (PTR), non-pelagic trawl (NPT), pot (POT), or hook and line (HAL). Areas include the Aleutian Islands (AI), Bering Sea (BS), Western Gulf of Alaska (WGOA), Central Gulf of Alaska (CGOA), West Yakutat (WY), and East Yakutat (EY).

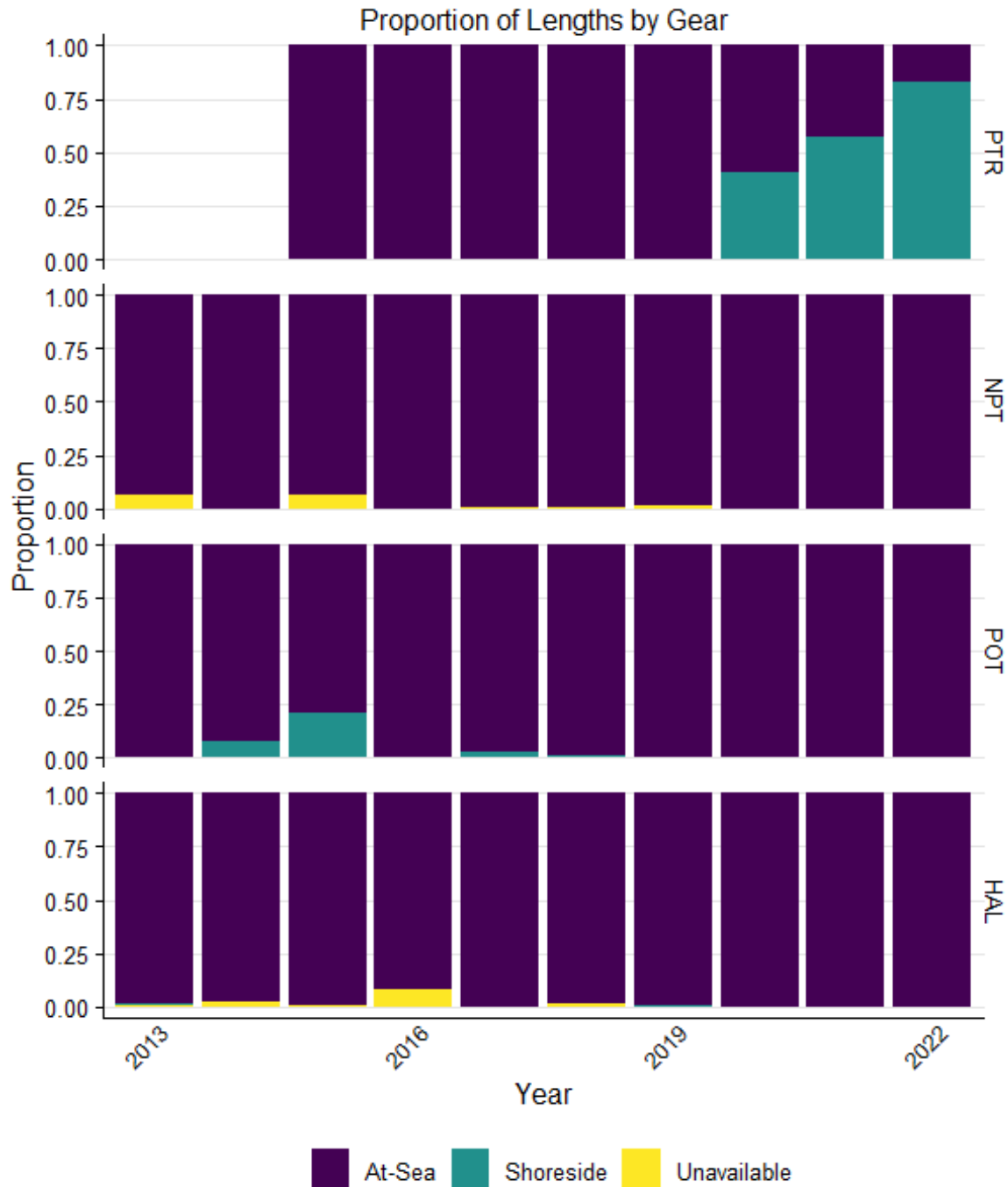


Figure 3.F.13. The proportion of sablefish lengths that were measured at-sea versus in ports by observers by gear type. At-sea sampling provides haul level information, while shoreside is lower resolution trip level information. Gear types include pelagic trawl (PTR), non-pelagic trawl (NPT), pot (POT), or hook and line (HAL). Areas include the Aleutian Islands (AI), Bering Sea (BS), Western Gulf of Alaska (WGOA), Central Gulf of Alaska (CGOA), West Yakutat (WY), and East Yakutat (EY).

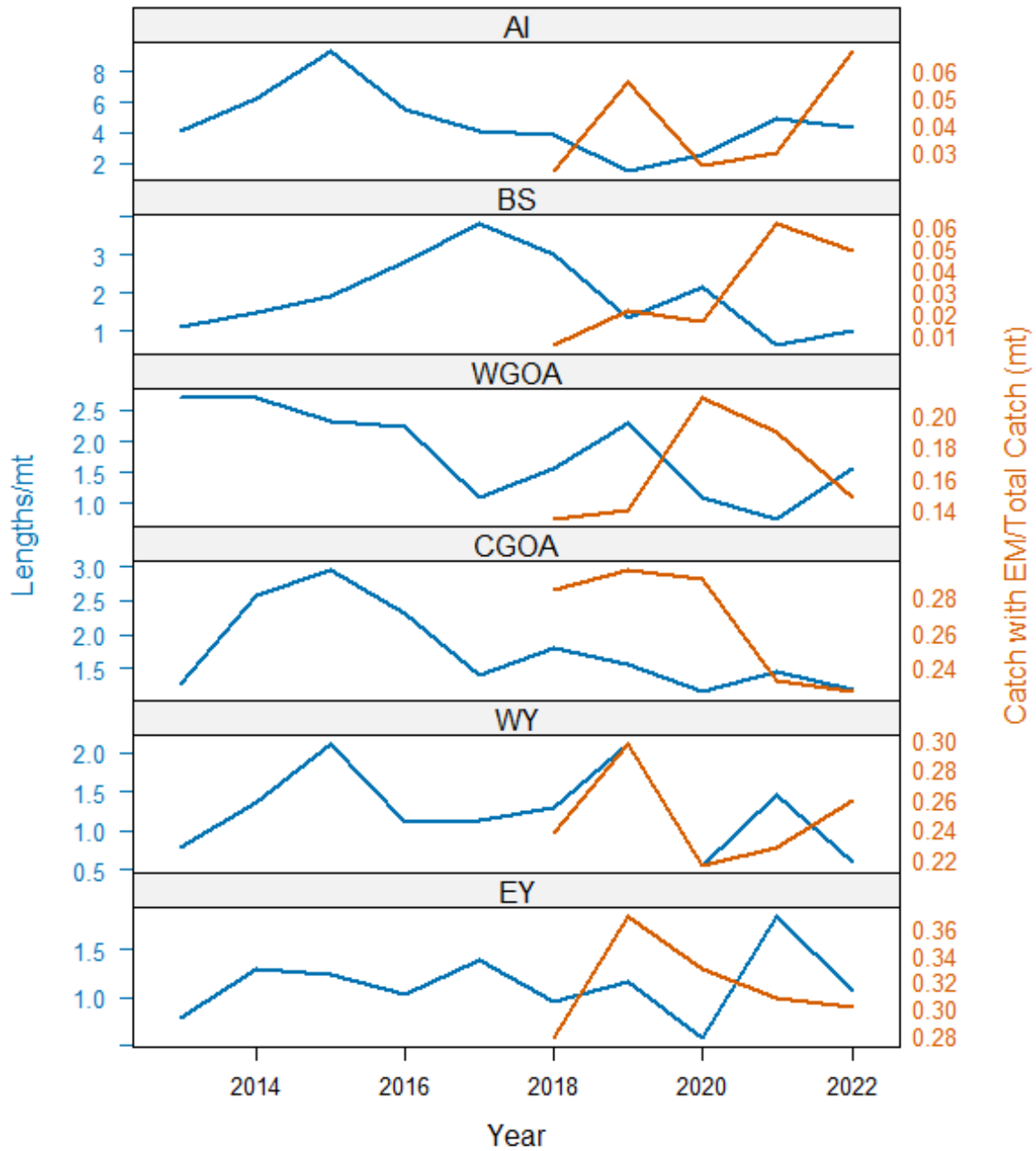


Figure 3.F.14. The proportion of sablefish catch with electronic monitoring (EM mt coverage/total fixed gear catch in mt) and the rate of length sampling (lengths/mt of catch) for fixed gear (pot and hook and line). Areas include the Aleutian Islands (AI), Bering Sea (BS), Western Gulf of Alaska (WGOA), Central Gulf of Alaska (CGOA), West Yakutat (WY), and East Yakutat (EY).

## **Additional Information**

### **Biological Collections**

- Lengths (mm), weight (tenth of a kg), and sagittal otoliths are collected by observers at-sea and at processing plants when North Pacific Groundfish Observer Program protocols call for collections. Otoliths are not collected from all fish that have lengths and weights recorded. Weights are collected when otoliths are collected.

### **Observer strata in the North Pacific Groundfish Observer Program**

- Full Coverage - Catcher/processors (with limited exceptions), motherships, catcher vessels that are participating in programs that have transferable prohibited species catch, catcher vessels using trawl gear that have requested full coverage for all fishing activity within the Bering Sea/Aleutian Islands FMP, and inshore processors receiving or processing Bering Sea pollock. Full coverage trips are all assumed to be 100% covered.
- Partial Coverage - Catcher vessels fishing in federally managed groundfish or parallel fisheries, excepting when in full coverage, catcher vessels participating in the Pacific halibut or sablefish IFQ fisheries, catcher vessels participating in the CDQ fisheries or those < 46ft LOA using hook-and-line gear for groundfish, catcher/processor that qualify for partial coverage, and shoreside or stationary floating processors that are not in the full coverage category are in the partial coverage category.
- EM - trawl gear: Trips in this strata have EM recordings and all are reviewed. The review is for compliance monitoring only and catch is not enumerated. Vessels operating in the trawl EM program are required to retain all catch (with limited exceptions) for shoreside sampling by observers at the plant. Shoreside observer sampling targets a 100% coverage rate of all EM - trawl deliveries in the BSAI and 30% in the GOA . This strata went into effect in 2020 as an Exempted Fishing Permit program, only on non-pelagic trawl vessels targeting Pollock, and is becoming regulated for the 2024 fishery.
- EM - fixed-gear: Includes both pot and hook-and-line vessels. Trips logged into ODDS have a partial coverage selection rate and, if selected, the vessel must record all hauls during that trip duration. After the videos are submitted, 30% of recorded hauls are reviewed and catch is fully censused along with discard status of each fish. There are no biological samples collected from fixed-gear EM trips.
- EM note - EM fixed gear is a completely different program from EM non-pelagic trawl, with different origins, directives and methodologies.
- No Coverage or Zero Selection - Vessels < 40ft LOA, jig and exempted vessels.

### **Caveats**

- Data prior to the 2013 North Pacific Observer Program restructure are not included in the analyses presented here due to structural changes.
- Not all observer strata were covered each year. For example, hook and line (HAL) tender was only covered in 2017, in which a total of four trips were made and thus deemed not a useful strata to include.
- 2020 - Observer sampling was significantly impacted March-June due to the pandemic, resulting in minimal coverage during those months and reducing the annual realized coverage rates.

## References

North Pacific Observe Program: <https://www.fisheries.noaa.gov/alaska/fisheries-observers/north-pacific-observer-program>