

PFA self-sampling report for WGWIDE, 2015-2019

Martin Pastoors, 28/08/2019 21:55:29

1 Introduction

The Pelagic Freezer-trawler Association (PFA) is an association that has nine member companies that together operate 19 freezer trawlers in five European countries (www.pelagicfish.eu). In 2015, the PFA has initiated a self-sampling programme that expands the ongoing monitoring programmes on board of pelagic freezer-trawlers by the specialized crew of the vessels. The primary objective of that monitoring programme is to assess the quality of fish. The expansion in the self-sampling programme consists of recording of haul information, recording the species compositions per haul and regularly taking random length-samples from the catch. The self-sampling is carried out by the vessel quality managers on board of the vessels, who have a long experience in assessing the quality of fish, and by the skippers/officers with respect to the haul information. The scientific coordination of the self-sampling programme is carried out by Martin Pastoors (PFA chief science officer) with support of Floor Quirijns (contractor).

2 Material and methods

The PFA self-sampling programme has been implemented incrementally on many vessels that belong to the members of the PFA. The self-sampling programme is designed in such a way that it follows as closely as possible the working practices on board of the different vessels and that it delivers relevant information for documenting the performance of the fishery and to assist stock assessments of the stocks involved. The following main elements can be distinguished in the self-sampling protocol:

- haul information (date, time, position, weather conditions, environmental conditions, gear attributed, estimated catch, optionally: species composition)
- batch information (total catch per batch=production unit, including variables like species, average size, average weight, fat content, gonads y/n and stomach fill)
- linking batch and haul information (essentially a key of how much of a batch is caught in which of the hauls)
- length information (length frequency measurements, either by batch or by haul)

The self-sampling information is collected using standardized Excel worksheets. Each participating vessel will send in the information collected during a trip by the end of the trip. The data will be checked and added to the database by Floor Quirijns and/or Martin Pastoors, who will also generate standardized trip reports (using RMarkdown) which will be sent back to the vessel within one or two days. The compiled data for all vessels is being used for specific purposes, e.g. reporting to expert groups, addressing specific fishery or biological questions and supporting detailed biological studies. The PFA publishes an annual report on the self-sampling programme.

A major feature of the PFA self-sampling programme is that it is tuned to the capacity of the vessel-crew to collect certain kinds of data. Depending on the number of crew and the space available on the vessel, certain types of measurements can or cannot be carried out. That is why the programme is essentially tuned to each vessel separately. And that is also the reason that the totals presented in this report can be somewhat different dependent on which variable is used. For example the estimate of total catch is different from the sum of the catch per species because not all vessels have supplied data on the species composition of the catch.

Because the self-sampling programme has been under development over the years, different numbers of vessels have been participating in the programme over different years. Results should not be interpreted as a census of the PFA fleet, but rather as an indicator of relative distributions and samples of catch and catch compositions.

In order to supply relevant information to WGWIDE 2019, the PFA self-sampling data has been filtered using the following approach. First, all catches per vessel, trip and species have been summed by week. For each vessel-trip-species-week combination, the proportion of the species in the catch were calculated. Then the following filter criteria have applied to the weekly data:

- for horse mackerel: latitude > 45, proportion in the catch > 10%, catch > 10 tonnes

- for mackerel : latitude > 45, proportion in the catch > 10%, catch > 10 tonnes
- for blue whiting : latitude > 50, proportion in the catch > 10%, catch > 10 tonnes
- for herring : division = 27.2.a, proportion in the catch > 10%, catch > 10 tonnes

Data have been processed up to 27 August 2019.

3 Results

3.1 General

An overview of all the selected self-sampling hauls between 2015 and (August) 2019 is shown in Table 3.1.

year	nvessels	ntrips	ndays	nhauls	catch	nlength	catch/trip	catch/day	catch/haul
2015	6	29	443	1,009	77,364	80,904	2,667	174	76
2016	9	57	748	1,771	154,044	76,026	2,702	205	86
2017	12	73	974	2,159	207,719	101,727	2,845	213	96
2018	16	104	1,484	3,385	317,981	192,988	3,057	214	93
2019	14	66	927	2,069	174,265	88,684	2,640	187	84
(all)	.	329	4,576	10,393	931,373	540,329	.	.	.

Table 3.1.1: PFA selfsampling summary of hauls in widely distributed pelagic fisheries with the number of days, hauls, trips, vessels, catch (tonnes), number of fish measured, catch rates (ton/effort) by year

Number of self-sampled hauls in widely distributed pelagic fisheries by year and area

division	2015	2016	2017	2018	2019	all
27.2.a	52	148	264	250	1	715
27.4.a	212	387	339	754	295	1,987
27.4.b	33	25	67	78	0	203
27.4.c	5	12	22	20	1	60
27.5.b	28	57	66	82	1	234
27.6.a	256	425	669	1,268	989	3,607
27.6.b	0	0	2	50	10	62
27.7.b	50	98	140	88	171	547
27.7.c	32	87	255	242	252	868
27.7.d	107	213	232	243	34	829
27.7.e	47	142	48	32	65	334
27.7.f	3	0	0	4	1	8
27.7.g	21	10	0	9	0	40
27.7.h	5	25	29	96	24	179
27.7.j	84	62	20	61	128	355
27.7.k	56	77	3	59	17	212
27.8.a	15	2	1	41	72	131
27.8.b	3	0	0	6	4	13
27.8.c	0	0	0	0	1	1
27.8.d	0	1	2	2	3	8
(all)	1,009	1,771	2,159	3,385	2,069	10,393

Table 3.1.2: PFA selfsampling summary of number of hauls per division in widely distributed pelagic fisheries

Catch compositions in widely distributed pelagic fisheries by year and species

species	englishname	scientificname	2015	2016	2017	2018	2019	all
whb	blue whiting	Micromesistius poutassou	16,472	37,882	49,220	137,226	81,237	322,037
mac	mackerel	Scomber scombrus	26,720	28,537	51,925	58,540	36,929	202,651
her	herring	Clupea harengus	17,622	25,117	29,803	56,064	15,011	143,617
hom	horse mackerel	Trachurus trachurus	9,634	14,791	12,541	28,031	25,060	90,057
arg	argentines	Argentina spp	2,210	997	977	3,117	3,859	11,160
pil	pilchard	Sardina pilchardus	1,132	2,552	414	946	72	5,116
spr	sprat	Sprattus sprattus	682	104	16	264	0	1,065
hke	hake	Merluccius merluccius	204	61	62	215	205	746
boc	boarfish	Capros aper	121	63	74	161	238	657
ane	anchovy	Engraulis encrasicolus	251	192	8	23	0	474
oth	NA	NA	574	119	108	165	175	1,142
(all)	(all)	(all)	75,623	110,416	145,148	284,751	162,786	778,723

Table 3.1.3: PFA selfsampling catch per species in widely distributed pelagic fisheries. OTH refers to all other species that are not the main target species

Haul positions

An overview of all self-sampled hauls in PFA widely distributed fisheries.

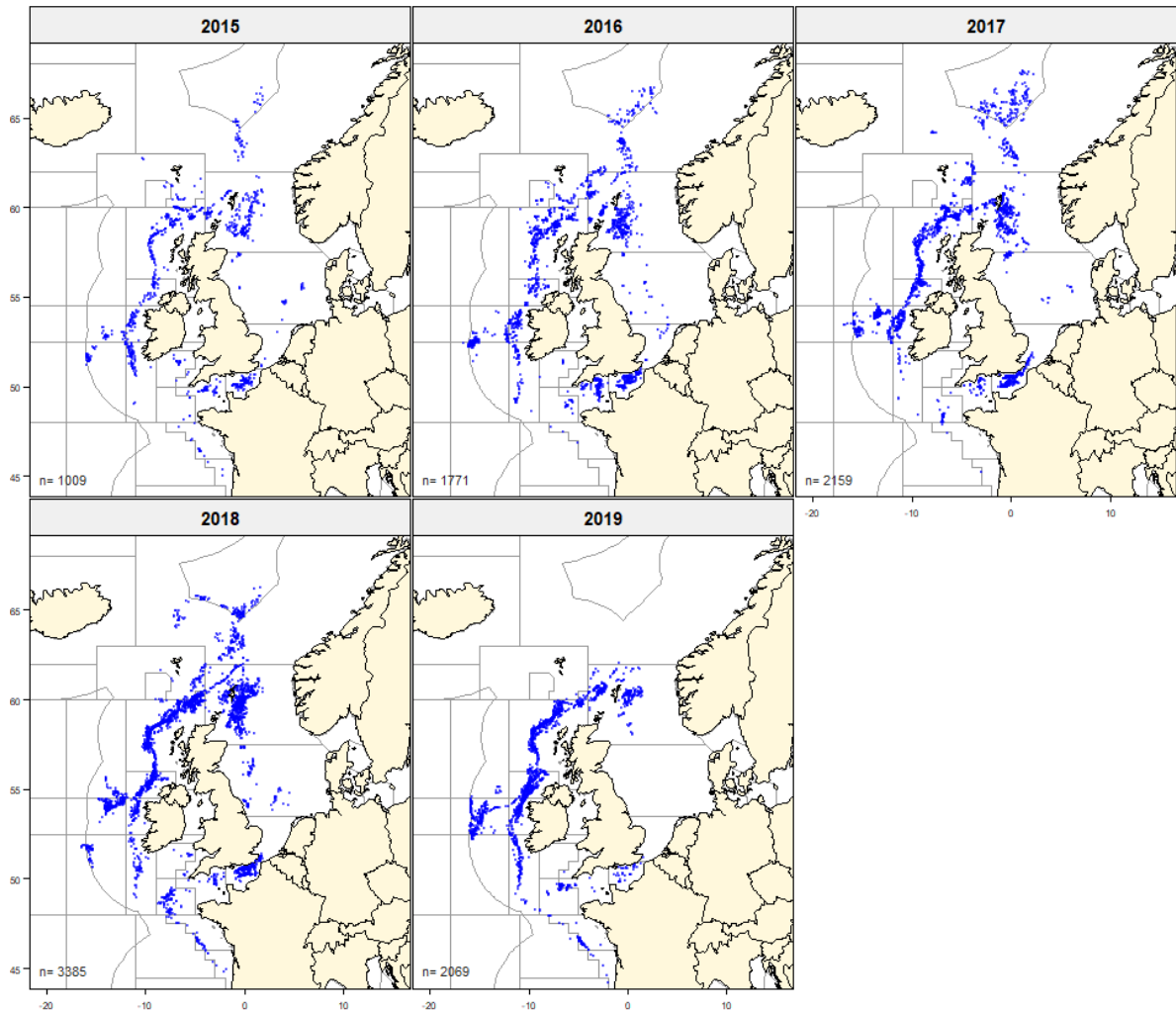


Figure 3.1.1: Haul positions in PFA self-sampled widely distributed pelagic fisheries. N indicates the number of hauls.

Catch rates for the main target species

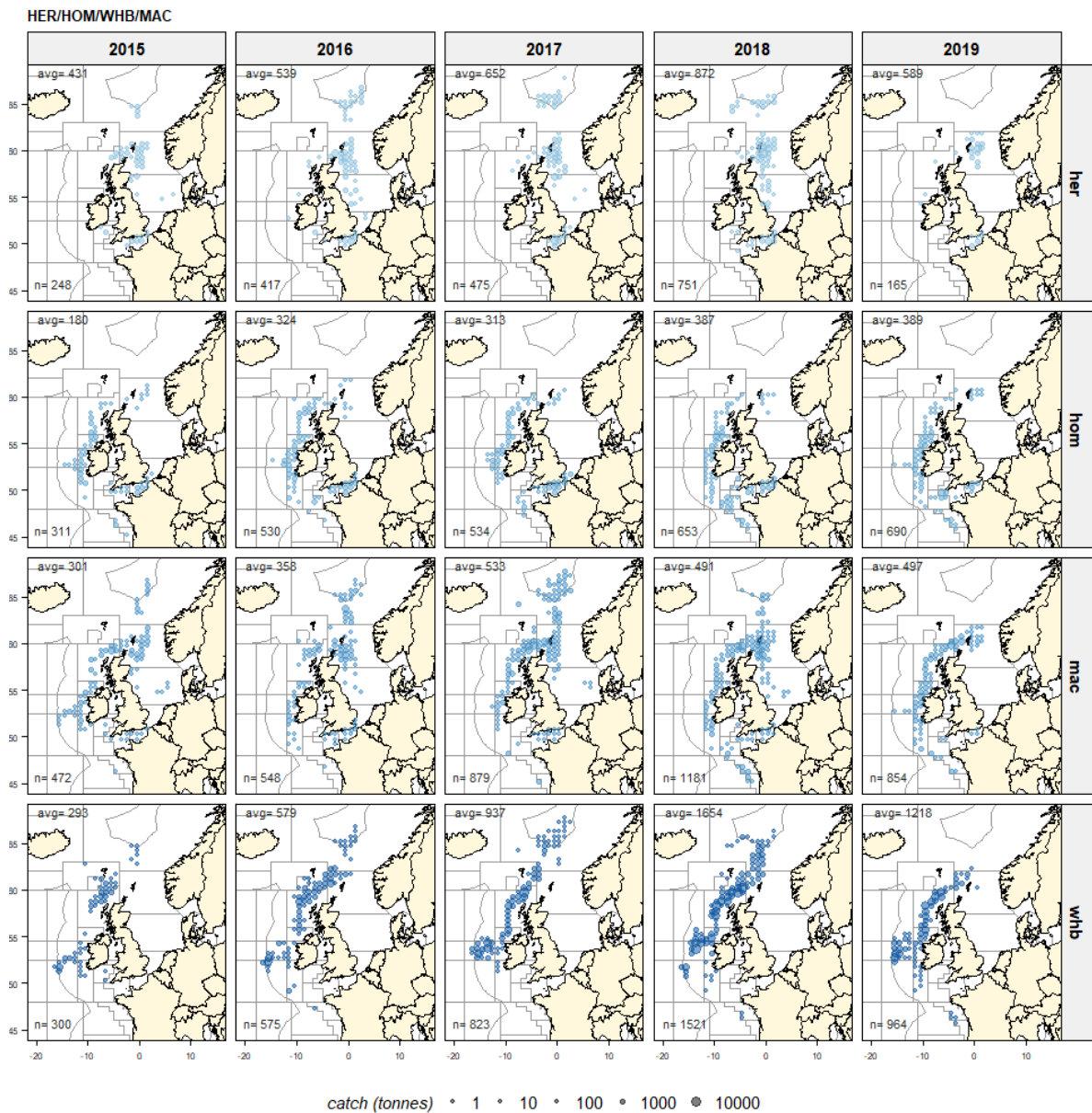


Figure 3.1.2: Catch per haul of the main target species in PFA self-sampled widely distributed pelagic fisheries

3.2 Mackerel (*Scomber scombrus*)

species	year	nvessels	ntrips	ndays	nhauls	catch	catch/trip	catch/day
mac	2015	6	26	237	473	26,820	1,031	113
mac	2016	9	51	318	554	34,838	683	109
mac	2017	11	65	490	889	64,599	993	131
mac	2018	16	80	690	1,191	59,018	737	85
mac	2019	14	55	477	858	38,838	706	81
mac	(all)	.	277	2,212	3,965	224,113	.	.

species	division	year	nvessels	ntrips	ndays	nhauls	catch	nlength
mac	27.2.a	2015	3	3	18	35	2,040	1,643
mac	27.2.a	2016	6	7	48	98	7,441	2,611
mac	27.2.a	2017	6	9	81	164	13,019	1,948
mac	27.2.a	2018	5	7	38	67	4,870	9
mac	27.2.a	2019	0	0	0	0	0	1
mac	27.4.a	2015	5	11	74	157	14,545	4,787
mac	27.4.a	2016	9	19	104	173	16,062	1,847
mac	27.4.a	2017	9	23	132	248	17,937	5,058
mac	27.4.a	2018	14	39	263	491	29,426	6,456
mac	27.4.a	2019	11	15	94	196	9,195	5,393
mac	27.4.b	2015	2	3	10	15	90	32
mac	27.4.b	2016	3	4	6	9	99	1
mac	27.4.b	2017	3	4	14	32	396	96
mac	27.4.b	2018	4	5	19	37	77	176
mac	27.4.c	2016	1	1	1	1	0	0
mac	27.4.c	2018	1	1	1	1	0	0
mac	27.5.b	2016	1	1	2	2	5	0
mac	27.5.b	2017	4	5	8	11	81	43
mac	27.6.a	2015	4	8	45	84	7,936	1,698
mac	27.6.a	2016	6	15	56	94	8,689	2,293
mac	27.6.a	2017	10	25	156	264	28,287	4,861
mac	27.6.a	2018	16	31	238	393	18,005	7,804
mac	27.6.a	2019	12	35	251	416	20,689	8,509
mac	27.7.b	2015	2	4	19	34	810	79
mac	27.7.b	2016	5	7	35	68	185	66
mac	27.7.b	2017	6	9	51	98	3,639	276
mac	27.7.b	2018	6	9	33	51	1,111	37
mac	27.7.b	2019	12	22	73	124	5,364	2,024
mac	27.7.c	2015	2	4	14	25	512	0
mac	27.7.c	2016	1	1	3	3	0	0
mac	27.7.c	2017	3	3	5	7	0	9
mac	27.7.c	2019	3	3	4	4	54	34
mac	27.7.d	2015	4	7	12	15	64	165
mac	27.7.d	2016	5	14	36	56	695	267
mac	27.7.d	2017	6	14	30	42	368	117
mac	27.7.d	2018	8	11	38	60	432	304
mac	27.7.d	2019	2	3	4	5	51	693
mac	27.7.e	2015	3	3	7	10	36	128
mac	27.7.e	2016	3	5	13	20	211	13
mac	27.7.e	2017	3	6	7	10	118	0
mac	27.7.e	2018	3	6	7	8	69	0
mac	27.7.e	2019	2	3	4	4	4	153
mac	27.7.f	2015	1	1	1	1	0	0
mac	27.7.f	2018	1	1	1	1	0	0
mac	27.7.g	2015	1	1	2	7	0	0
mac	27.7.g	2018	1	2	5	8	21	0
mac	27.7.h	2017	1	1	1	1	0	0
mac	27.7.h	2018	4	4	7	8	235	3

mac	27.7.h	2019	1	1	2	2	242	8
mac	27.7.j	2015	4	7	33	69	763	686
mac	27.7.j	2016	3	6	20	29	1,413	61
mac	27.7.j	2017	3	4	6	11	495	170
mac	27.7.j	2018	8	11	27	39	2,661	314
mac	27.7.j	2019	8	11	47	89	2,348	2,112
mac	27.7.k	2015	3	3	10	18	18	0
mac	27.7.k	2019	1	1	1	1	0	0
mac	27.8.a	2015	1	1	2	3	0	0
mac	27.8.a	2016	1	1	1	1	33	0
mac	27.8.a	2018	3	3	18	21	1,509	428
mac	27.8.a	2019	3	3	12	16	887	702
mac	27.8.b	2018	2	2	3	4	364	211
mac	27.8.b	2019	1	1	1	1	0	270
mac	27.8.d	2017	1	1	1	1	253	0
mac	27.8.d	2018	2	2	2	2	233	319
mac	(all)	2015		56	247	473	26,814	9,218
mac	(all)	2016		81	325	554	34,833	7,159
mac	(all)	2017		104	492	889	64,593	12,578
mac	(all)	2018		134	700	1,191	59,013	16,061
mac	(all)	2019		98	493	858	38,834	19,899
mac	(all)	(all)		473	2,257	3,965	224,087	64,915

Table 3.2.1: Mackerel self-sampling summary in widely distributed pelagic fisheries with the number of days, hauls, trips, vessels, catch (tonnes), number of fish measured, catch rates (ton/effort). Top: by year. Bottom: by year and division.

Mackerel catch by rectangle

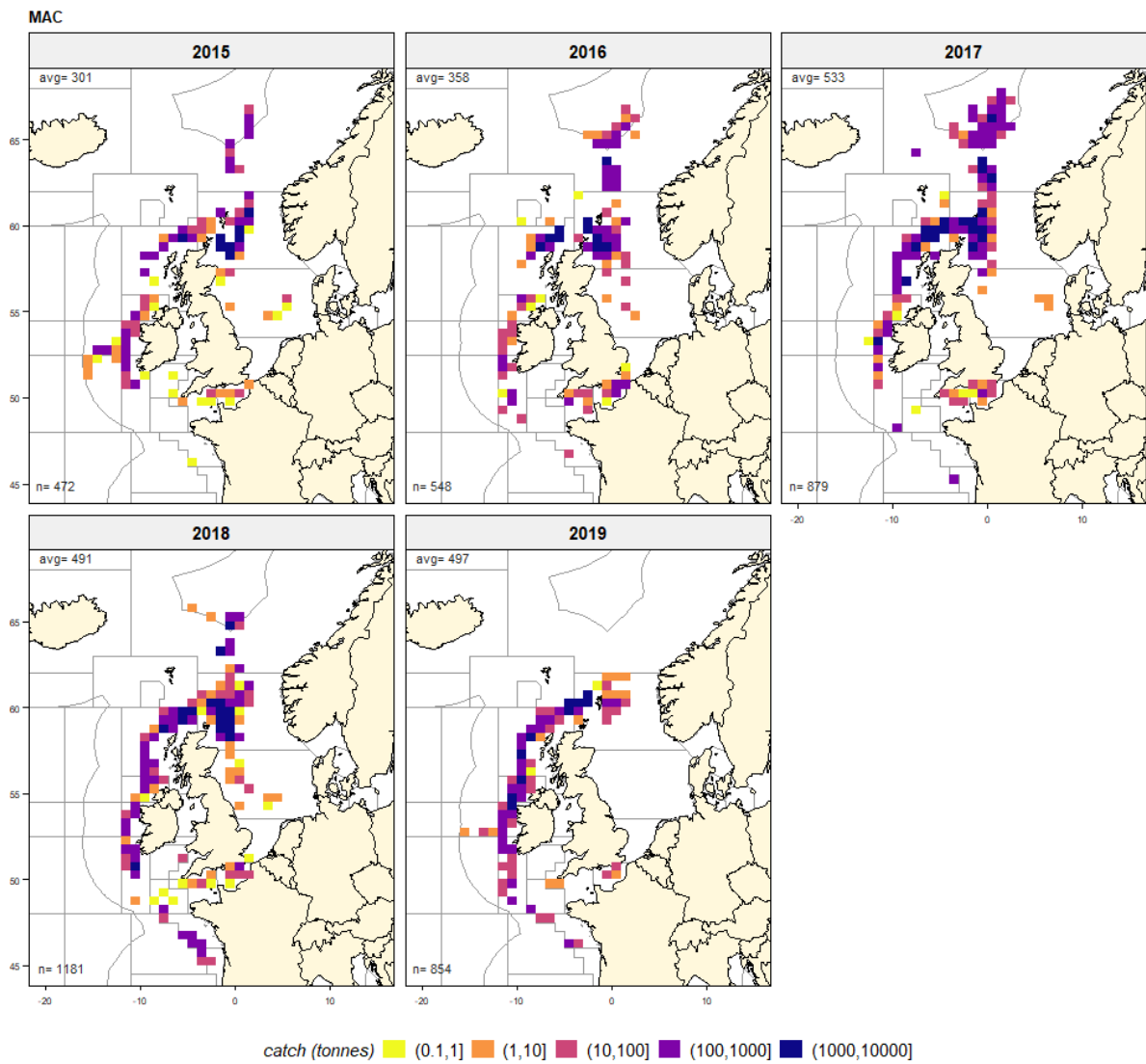


Figure 3.2.1: Mackerel catch per per square in PFA self-sampled widely distributed pelagic fisheries

Mackerel length distributions

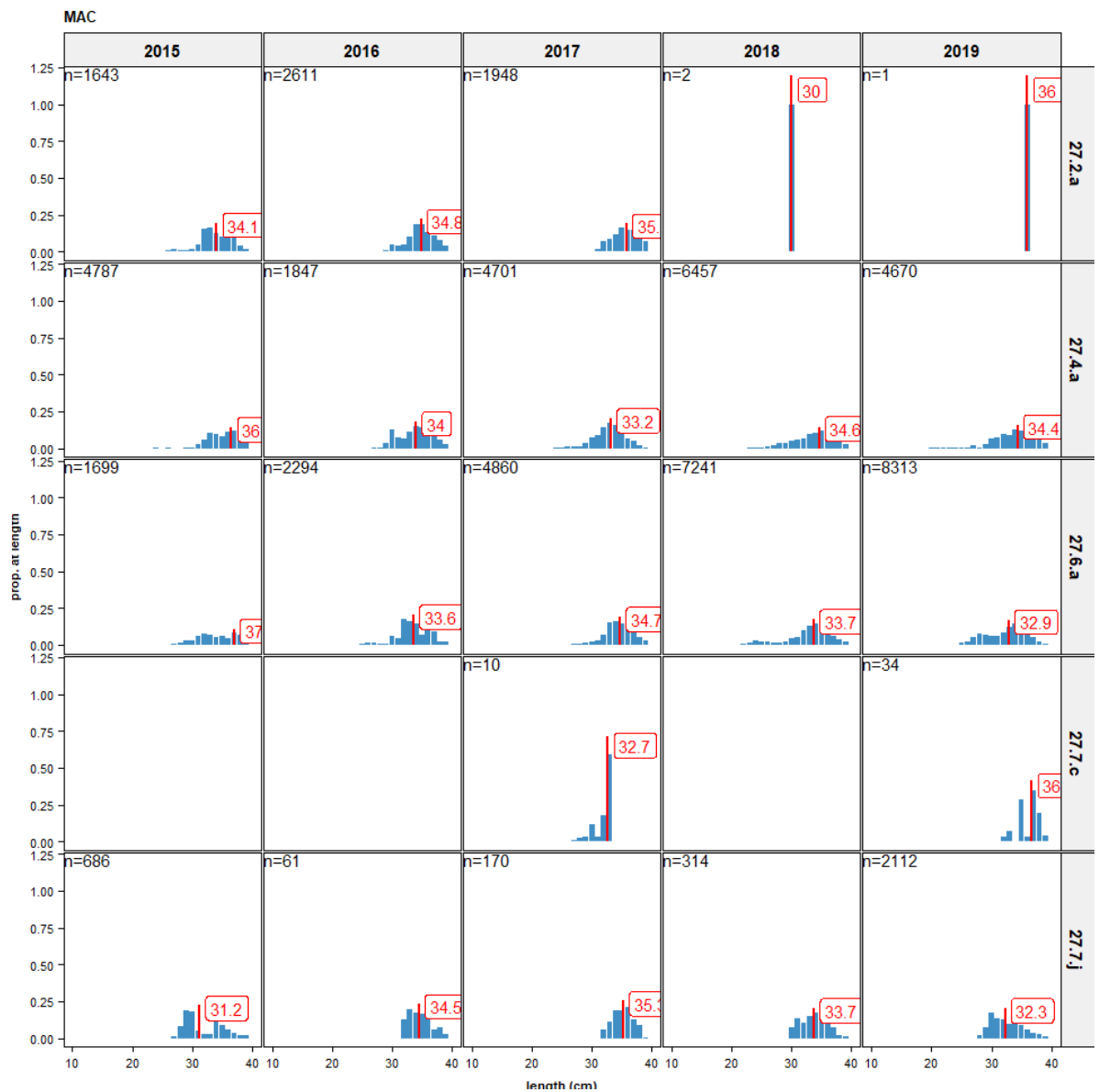
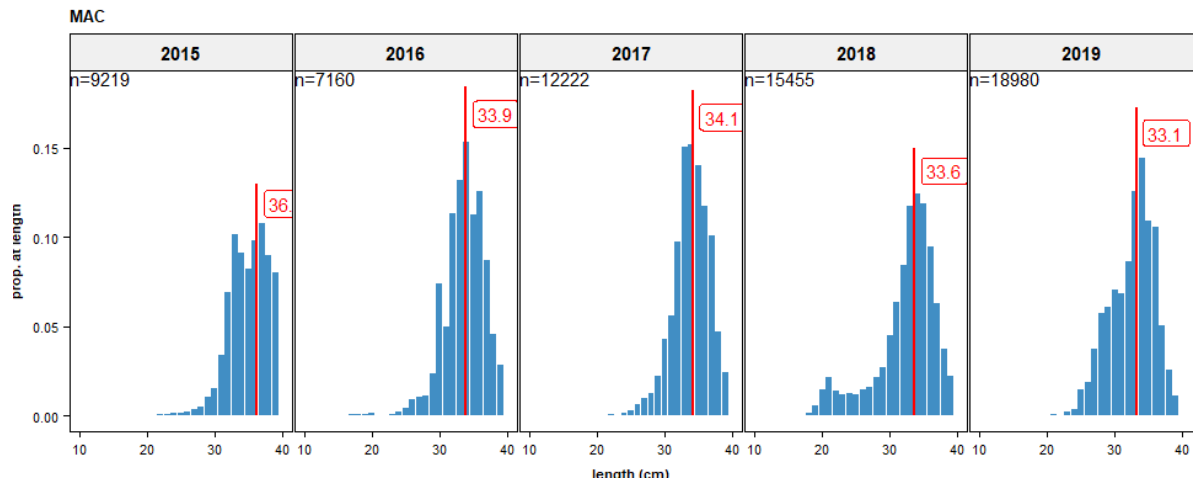


Figure 3.2.2: Mackerel length distributions by year (top) and by year and division (bottom) in PFA self-sampled widely distributed pelagic fisheries

Mackerel fishing depth

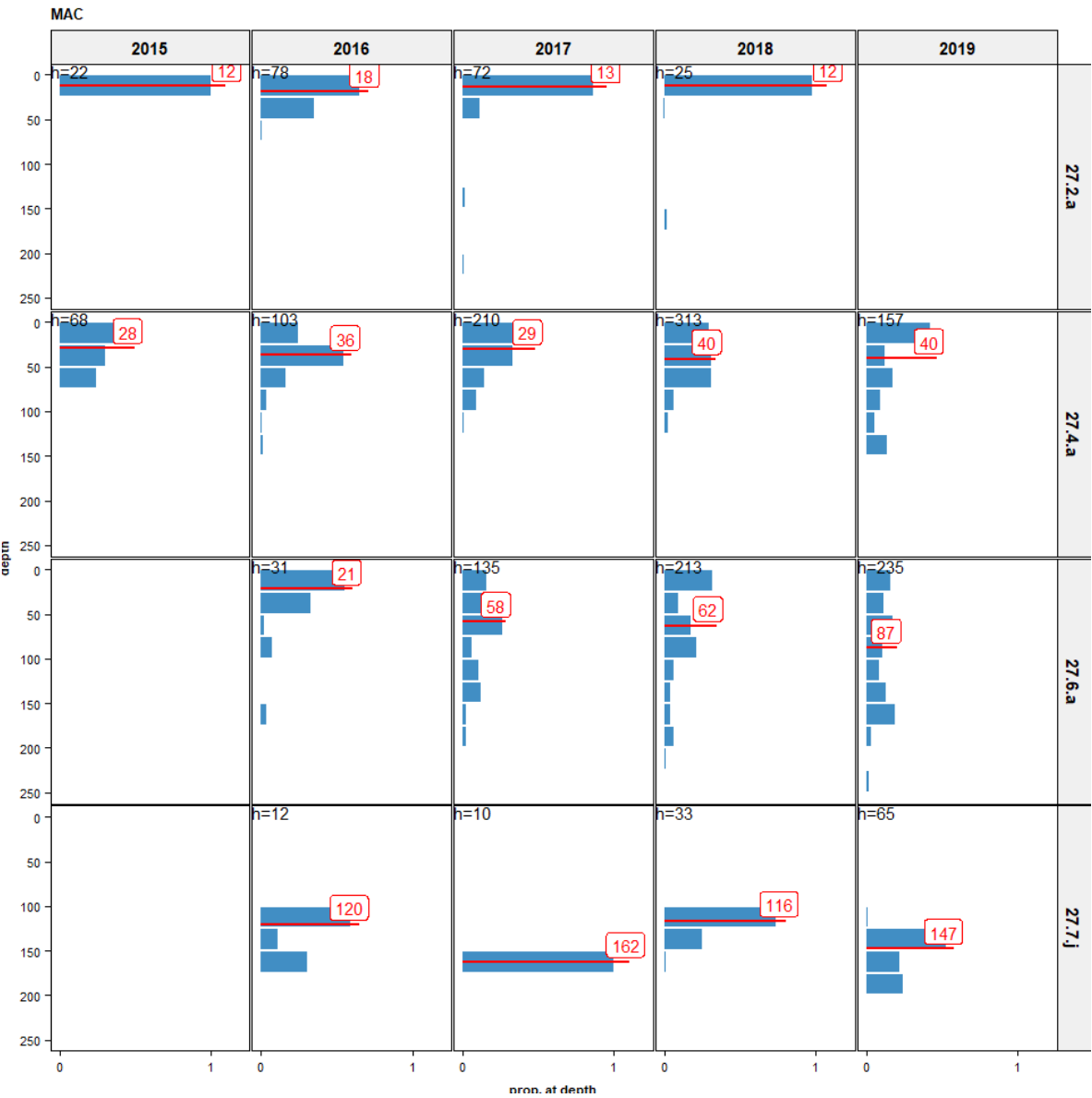


Figure 3.2.3: Mackerel depth distribution of catches by year and division in PFA self-sampled widely distributed pelagic fisheries. Median depth indicated in red. Number of hauls in black.

3.3 Horse mackerel (Trachurus trachurus)

species	year	nvessels	ntrips	ndays	nhauls	catch	catch/trip	catch/day
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hom	2015	6	21	163	312	10,638	506	65
hom	2016	9	43	304	550	23,074	536	75
hom	2017	10	41	285	535	21,384	521	75
hom	2018	14	48	374	656	30,280	630	80
hom	2019	14	44	394	699	27,695	629	70
hom	(all)	.	197	1,520	2,752	113,071	.	.

species	division	year	nvessels	ntrips	ndays	nhauls	catch	nlength
hom	27.2.a	2016	1	1	6	19	0	0
hom	27.4.a	2015	4	5	7	10	7	85
hom	27.4.a	2016	6	6	21	28	115	52
hom	27.4.a	2017	5	5	10	12	30	5
hom	27.4.a	2018	4	4	11	18	5	69
hom	27.4.a	2019	5	5	22	33	36	85
hom	27.4.c	2015	1	2	2	2	110	0
hom	27.4.c	2016	1	1	1	1	0	0
hom	27.4.c	2017	2	3	10	18	1,370	0
hom	27.4.c	2018	2	3	7	9	853	451
hom	27.6.a	2015	3	6	39	66	2,745	2,233
hom	27.6.a	2016	6	16	92	152	4,750	3,994
hom	27.6.a	2017	8	13	82	159	5,302	4,337
hom	27.6.a	2018	13	23	125	235	11,983	12,014
hom	27.6.a	2019	10	23	154	262	10,676	4,876
hom	27.7.b	2015	4	6	27	48	1,482	563
hom	27.7.b	2016	5	7	45	89	4,301	2,043
hom	27.7.b	2017	6	12	57	104	4,728	3,459
hom	27.7.b	2018	9	11	39	60	2,273	1,663
hom	27.7.b	2019	11	23	77	127	4,220	2,600
hom	27.7.c	2015	2	3	12	23	350	136
hom	27.7.c	2016	4	4	18	35	2,067	878
hom	27.7.c	2017	6	8	19	28	612	999
hom	27.7.c	2019	4	4	5	5	133	62
hom	27.7.d	2015	4	6	32	52	2,063	3,864
hom	27.7.d	2016	5	16	77	131	7,225	6,313
hom	27.7.d	2017	7	19	84	154	7,339	1,016
hom	27.7.d	2018	6	14	73	141	6,289	3,898
hom	27.7.d	2019	3	4	13	17	1,380	913
hom	27.7.e	2015	5	7	10	15	328	258
hom	27.7.e	2016	5	9	18	22	217	80
hom	27.7.e	2017	3	6	8	13	368	0
hom	27.7.e	2018	4	5	13	18	394	0
hom	27.7.e	2019	6	9	29	61	3,849	6,672
hom	27.7.f	2015	1	1	2	2	50	0
hom	27.7.f	2018	2	2	4	4	276	0
hom	27.7.g	2015	1	1	1	1	0	0
hom	27.7.g	2018	1	1	4	7	401	77
hom	27.7.h	2016	1	1	8	16	1,297	5,043
hom	27.7.h	2017	2	4	17	29	1,326	0
hom	27.7.h	2018	9	13	50	89	6,311	7,804
hom	27.7.h	2019	6	6	13	21	983	2,663
hom	27.7.j	2015	4	6	35	79	3,081	4,595
hom	27.7.j	2016	4	8	29	55	3,091	709
hom	27.7.j	2017	3	5	7	13	159	463
hom	27.7.j	2018	7	10	31	46	813	519
hom	27.7.j	2019	10	14	58	110	4,871	1,617
hom	27.7.k	2015	2	2	2	3	104	390
hom	27.7.k	2017	2	2	3	3	94	101
hom	27.7.k	2019	1	1	1	1	0	0
hom	27.8.a	2015	1	1	3	10	313	0
hom	27.8.a	2016	2	2	2	2	7	0
hom	27.8.a	2017	1	1	1	1	30	0
hom	27.8.a	2018	3	3	19	25	670	0

hom	27.8.a	2019	5	9	36	57	1,527	341
hom	27.8.b	2015	1	1	1	1	0	0
hom	27.8.b	2018	1	1	2	3	2	0
hom	27.8.b	2019	1	1	2	2	4	0
hom	27.8.d	2017	1	1	1	1	21	0
hom	27.8.d	2018	1	1	1	1	3	0
hom	27.8.d	2019	1	1	2	3	9	56
hom	(all)	2015		47	173	312	10,633	12,124
hom	(all)	2016		71	317	550	23,070	19,112
hom	(all)	2017		79	299	535	21,379	10,380
hom	(all)	2018		91	379	656	30,273	26,495
hom	(all)	2019		100	412	699	27,688	19,885
hom	(all)	(all)		388	1,580	2,752	113,043	87,996

Table 3.3.1: Horse mackerel self-sampling summary in widely distributed pelagic fisheries with the number of days, hauls, trips, vessels, catch (tonnes), number of fish measured, catch rates (ton/effort). Top: by year. Bottom: by year and division.

Horse mackerel catch by rectangle

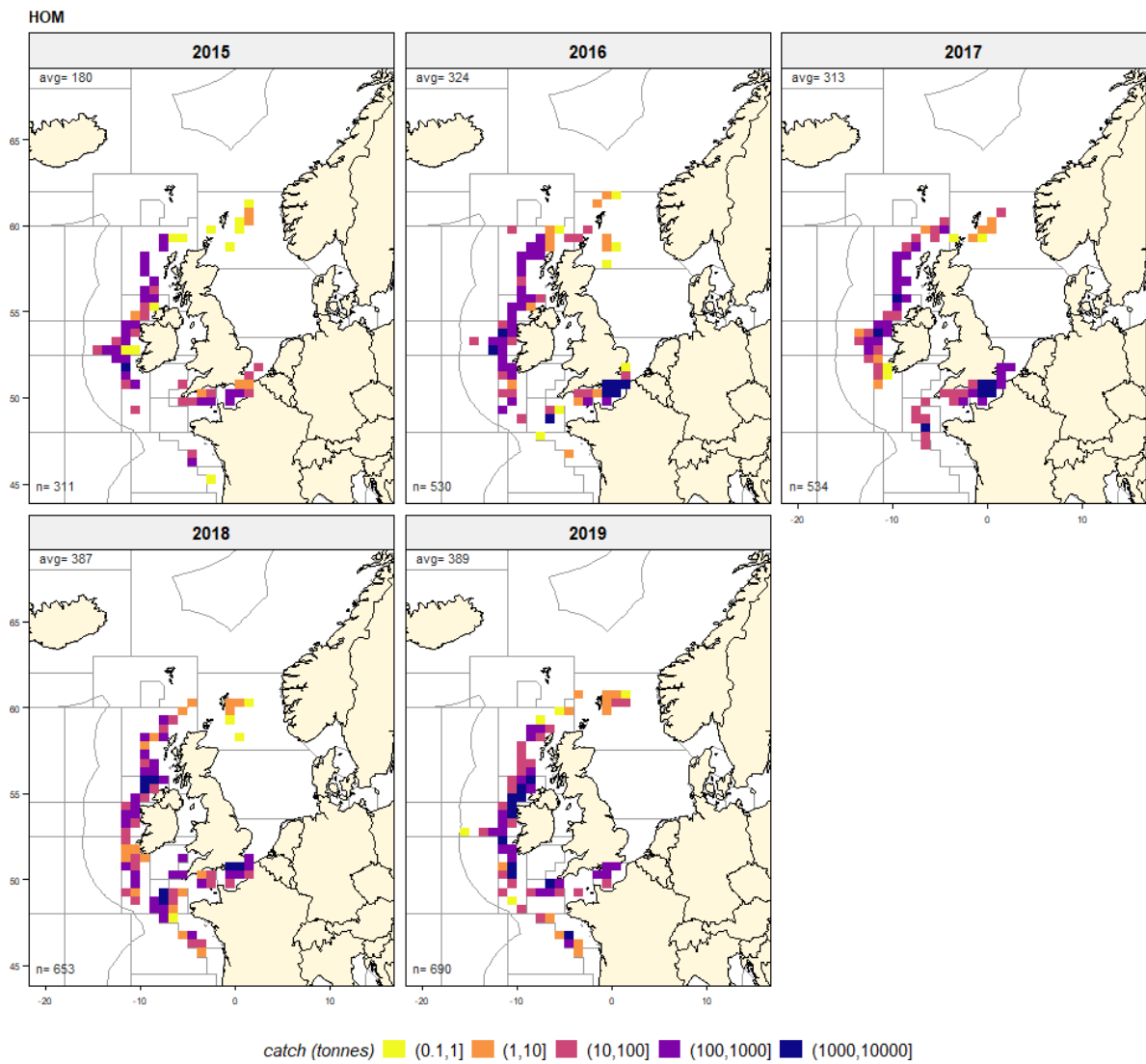


Figure 3.3.1: Horse mackerel catch per per square in PFA self-sampled widely distributed pelagic fisheries

Horse mackerel length distributions

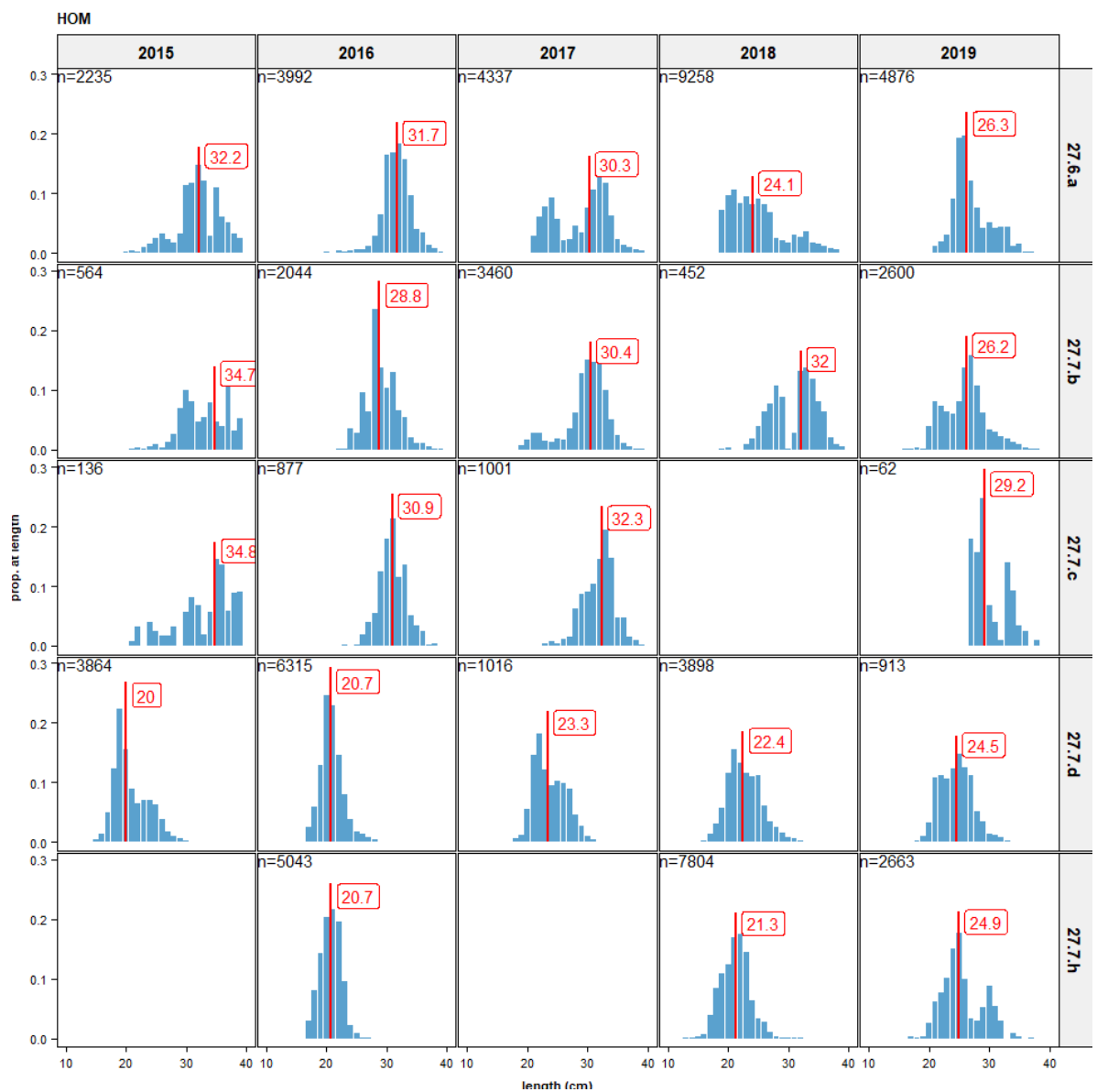
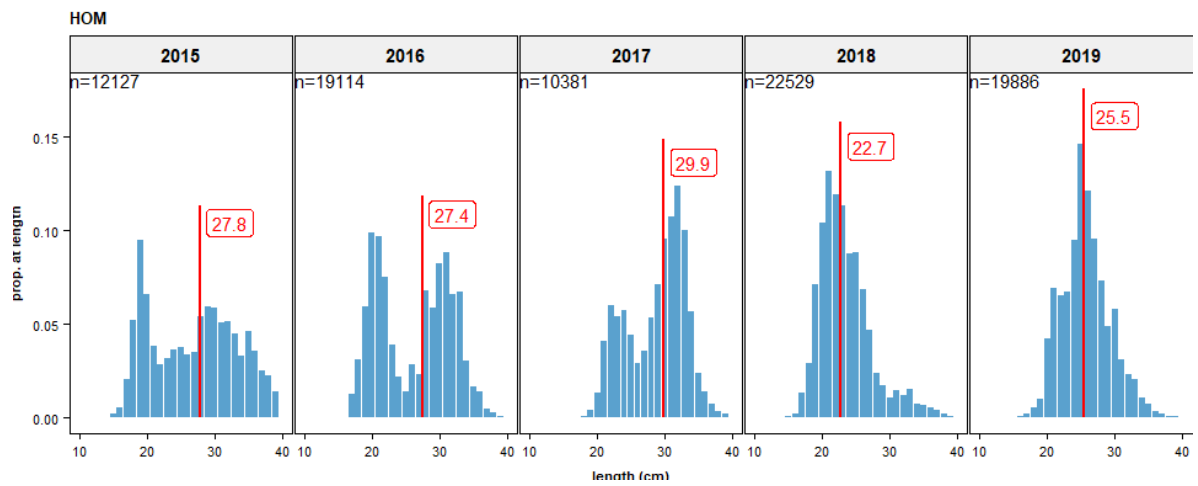


Figure 3.3.2: Horse mackerel length distributions by year (top) and by year and division (bottom) in PFA self-sampled widely distributed pelagic fisheries

Horse mackerel fishing depth

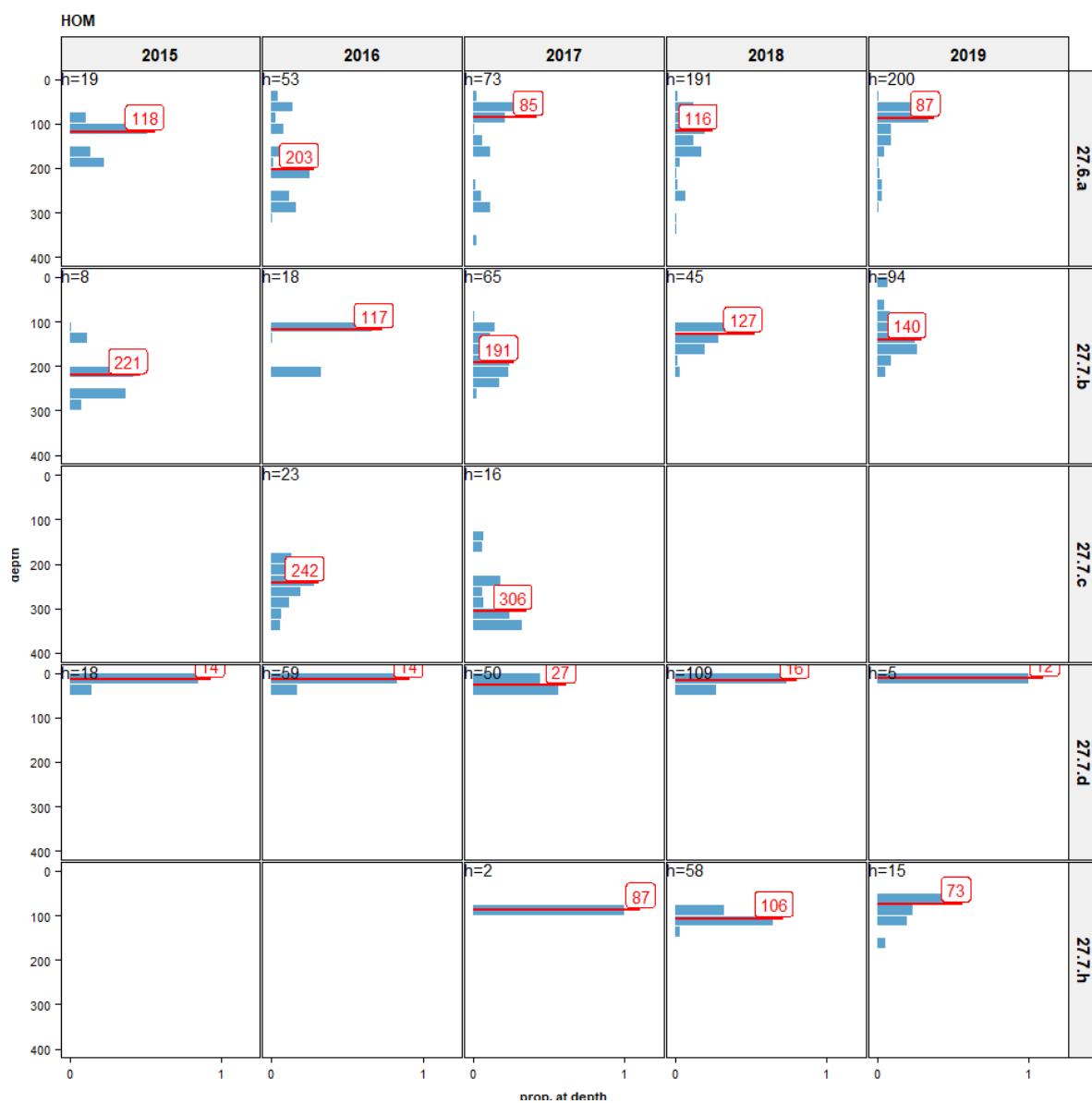


Figure 3.3.3: Horse mackerel depth distribution of catches by year and division in PFA self-sampled widely distributed pelagic fisheries. Median depth indicated in red. Number of hauls in black.

3.4 Blue whiting (*Micromesistius poutassou*)

species	year	nvessels	ntrips	ndays	nhauls	catch	catch/trip	catch/day
whb	2015	5	18	147	305	15,545	863	105
whb	2016	9	24	252	578	49,411	2,058	196
whb	2017	8	34	386	840	78,792	2,317	204
whb	2018	15	49	610	1,525	162,405	3,314	266
whb	2019	13	41	413	969	87,871	2,143	212
whb	(all)	.	166	1,808	4,217	394,024	.	.

species	division	year	nvessels	ntrips	ndays	nhauls	catch	nlength
whb	27.2.a	2015	3	3	11	20	96	573
whb	27.2.a	2016	6	6	32	62	2,345	1,369
whb	27.2.a	2017	5	9	56	92	2,587	2,597
whb	27.2.a	2018	6	8	91	158	12,032	12,352
whb	27.2.a	2019	1	1	1	1	14	77
whb	27.4.a	2015	1	1	1	1	0	0
whb	27.4.a	2016	4	5	35	73	7,791	6,614
whb	27.4.a	2017	2	2	5	7	726	352
whb	27.4.a	2018	9	10	27	55	2,946	6,359
whb	27.4.a	2019	5	5	24	45	1,829	3,585
whb	27.5.b	2015	2	3	20	28	1,872	9,970
whb	27.5.b	2016	3	4	29	57	5,577	4,685
whb	27.5.b	2017	5	6	40	64	7,959	8,226
whb	27.5.b	2018	5	7	52	82	7,927	4,560
whb	27.5.b	2019	1	1	1	1	68	84
whb	27.6.a	2015	3	7	55	127	7,376	15,149
whb	27.6.a	2016	4	11	93	210	20,327	12,244
whb	27.6.a	2017	7	16	163	378	39,084	36,330
whb	27.6.a	2018	12	29	338	861	91,577	72,775
whb	27.6.a	2019	12	25	238	581	55,600	25,450
whb	27.6.b	2017	1	1	2	2	158	0
whb	27.6.b	2018	6	6	22	49	7,634	3,211
whb	27.6.b	2019	3	3	6	10	604	69
whb	27.7.b	2015	2	4	9	12	115	0
whb	27.7.b	2016	3	3	14	21	27	0
whb	27.7.b	2017	5	6	31	57	51	86
whb	27.7.b	2018	3	3	6	11	1,941	531
whb	27.7.b	2019	10	11	17	29	813	1,768
whb	27.7.c	2015	2	4	13	22	888	0
whb	27.7.c	2016	4	8	37	66	5,471	5,358
whb	27.7.c	2017	6	10	96	230	28,219	16,945
whb	27.7.c	2018	6	9	76	235	30,575	21,392
whb	27.7.c	2019	10	16	99	246	26,403	10,726
whb	27.7.d	2017	1	1	2	3	0	0
whb	27.7.e	2015	1	1	1	1	0	0
whb	27.7.f	2015	1	1	1	1	152	0
whb	27.7.g	2015	1	1	1	1	5	0
whb	27.7.j	2015	4	6	21	36	64	0
whb	27.7.j	2016	3	4	6	11	376	0
whb	27.7.j	2017	2	2	4	7	4	139
whb	27.7.j	2018	5	5	10	12	123	174
whb	27.7.j	2019	6	7	20	25	132	35
whb	27.7.k	2015	3	3	24	56	4,972	8,784
whb	27.7.k	2016	3	3	29	77	7,488	4,845
whb	27.7.k	2018	3	3	20	59	7,645	3,077
whb	27.7.k	2019	4	4	11	17	2,025	401
whb	27.8.a	2018	1	1	2	3	1	0

whb	27.8.a	2019	3	3	8	12	284	1,305
whb	27.8.b	2019	1	1	2	2	93	0
whb	27.8.d	2016	1	1	1	1	6	0
whb	(all)	2015		34	157	305	15,540	34,476
whb	(all)	2016		45	276	578	49,408	35,115
whb	(all)	2017		53	399	840	78,788	64,675
whb	(all)	2018		81	644	1,525	162,401	124,431
whb	(all)	2019		77	427	969	87,865	43,500
whb	(all)	(all)		290	1,903	4,217	394,002	302,197

Table 3.4.1: Blue whiting self-sampling summary in widely distributed pelagic fisheries with the number of days, hauls, trips, vessels, catch (tonnes), number of fish measured, catch rates (ton/effort). Top: by year. Bottom: by year and division.

Blue whiting catch by rectangle

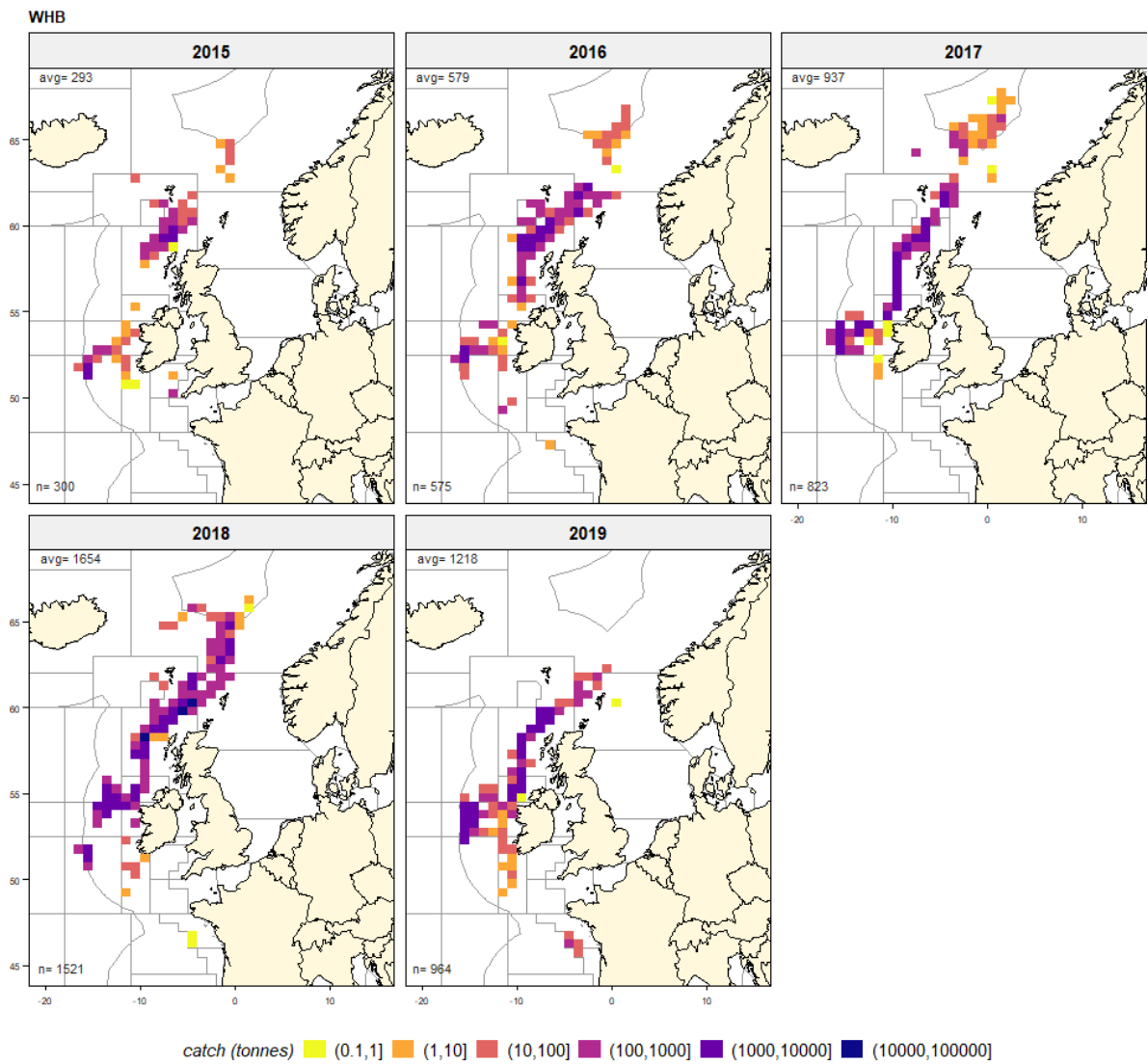


Figure 3.4.1: Blue whiting catch per per square in PFA self-sampled widely distributed pelagic fisheries

Blue whiting length distributions

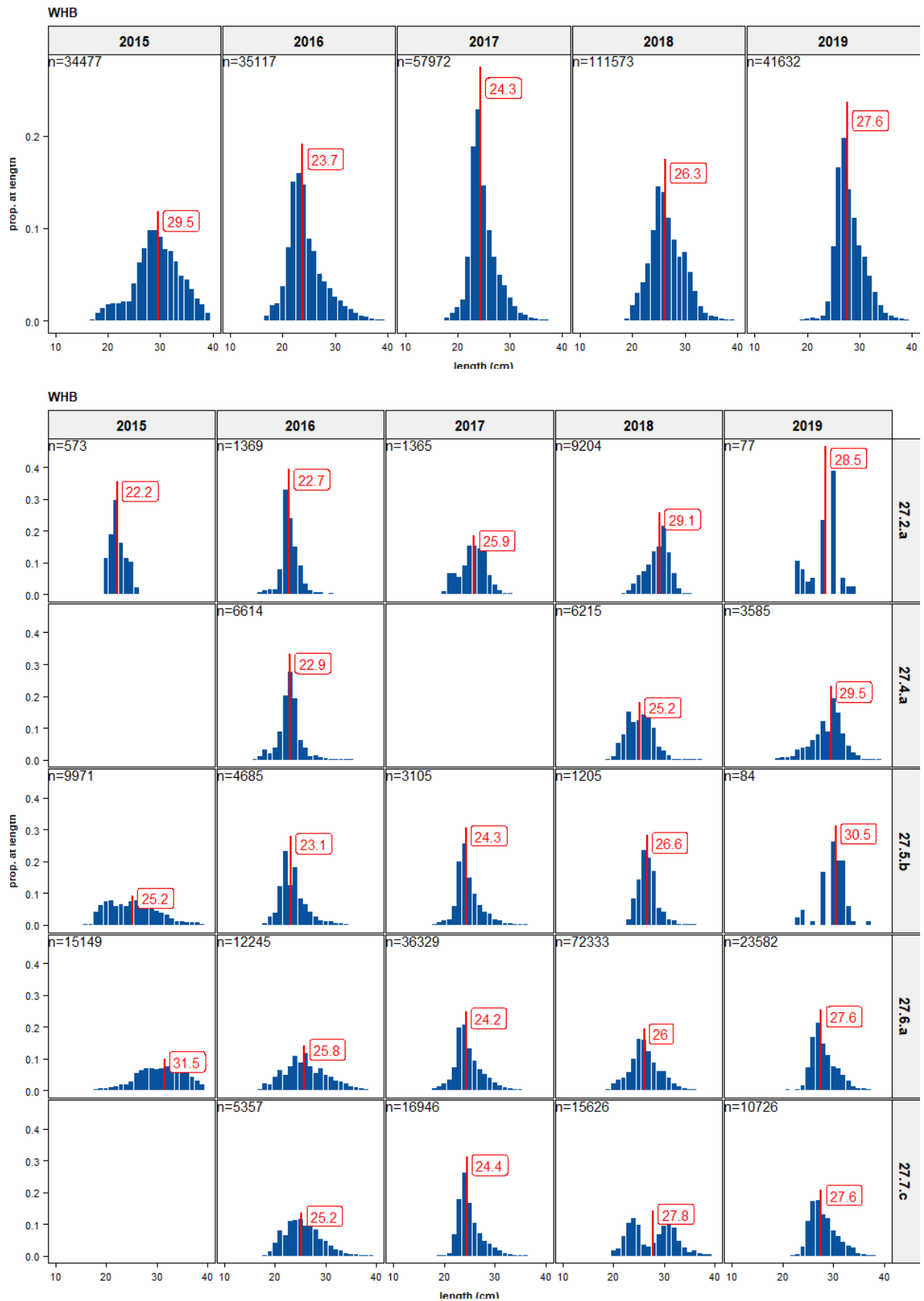


Figure 3.4.2: Blue whiting length distributions by year (top) and by year and division (bottom) in PFA self-sampled widely distributed pelagic fisheries

Blue whiting fishing depth

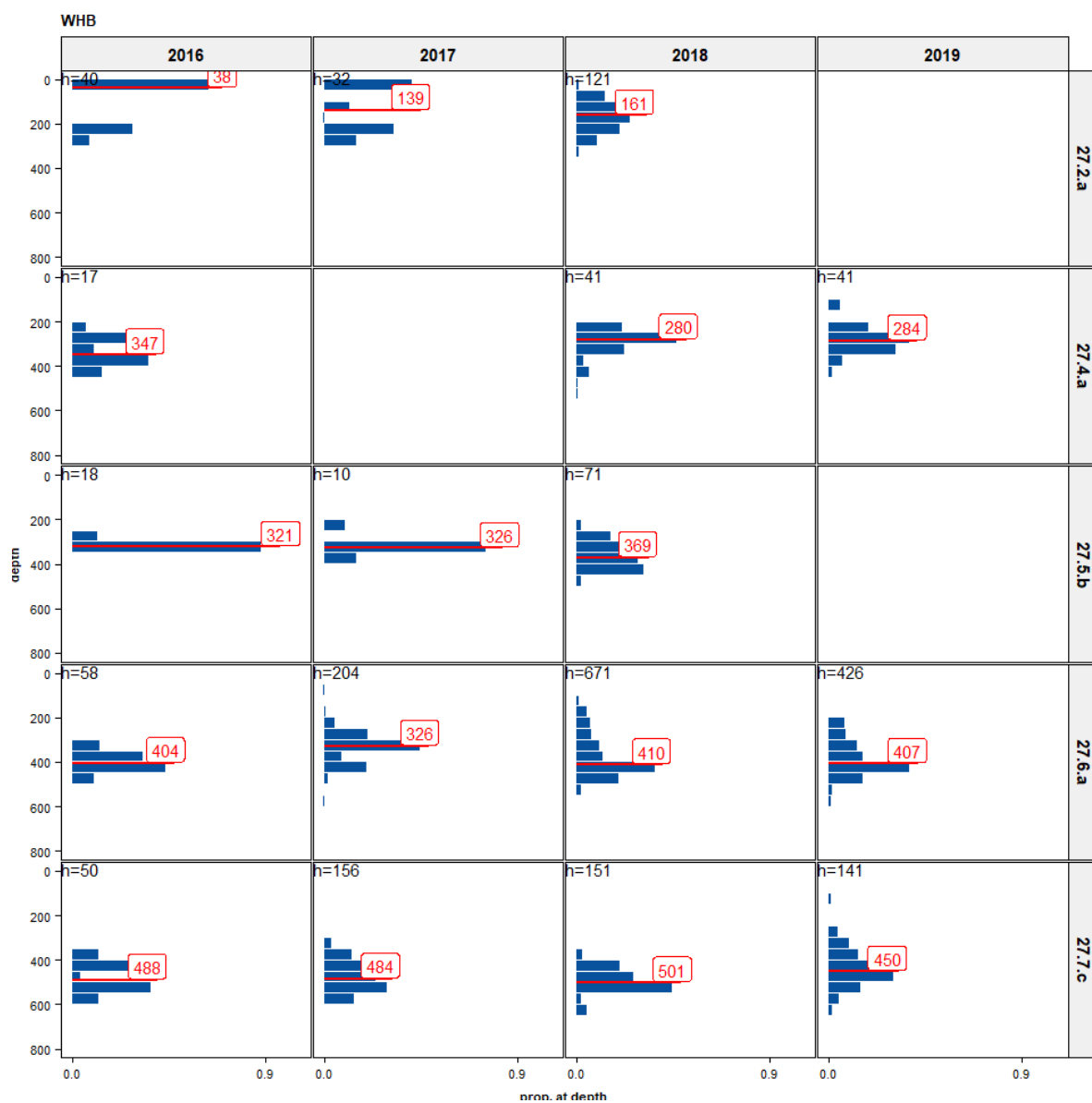


Figure 3.4.3: Blue whiting depth distribution of catches by year and division in PFA self-sampled widely distributed pelagic fisheries. Median depth indicated in red. Number of hauls in black.

3.5 Herring (*Clupea harengus*)

Here we selected only hauls north of 62 degrees, to get the catches of Atlanto-scandian herring. Therefore this gives another impression that the earlier catch tables in which some North Sea herring may have been included south of 62 degrees.

species	year	nvessels	ntrips	ndays	nhauls	catch	catch/trip	catch/day
her	2015	2	2	9	18	1,369	684	152
her	2016	6	7	40	85	3,362	480	84
her	2017	4	7	42	83	7,950	1,135	189
her	2018	4	5	36	68	5,277	1,055	146
her	(all)	.	21	127	254	17,958	.	.

species	division	year	nvessels	ntrips	ndays	nhauls	catch	nlength
her	27.2.a	2015	2	2	9	18	1,369	1,260
her	27.2.a	2016	6	7	40	85	3,362	1,206
her	27.2.a	2017	4	7	42	83	7,950	2,210
her	27.2.a	2018	4	5	36	68	5,277	490
her	other	2015	5	16	105	234	17,379	23,821
her	other	2016	9	31	137	335	32,243	13,429
her	other	2017	10	35	165	398	30,543	11,878
her	other	2018	13	53	285	685	55,064	25,506
her	other	2019	8	17	72	169	14,731	5,399
her	(all)	2015		18	114	252	18,748	25,081
her	(all)	2016		38	177	420	35,605	14,635
her	(all)	2017		42	207	481	38,493	14,088
her	(all)	2018		58	321	753	60,341	25,996
her	(all)	2019		17	72	169	14,731	5,399
her	(all)	(all)		173	891	2,075	167,918	85,199

Table 3.5.1: Herring self-sampling summary in widely distributed pelagic fisheries with the number of days, hauls, trips, vessels, catch (tonnes), number of fish measured, catch rates (ton/effort). Top: by year. Bottom: by year and division.

Herring catch by rectangle

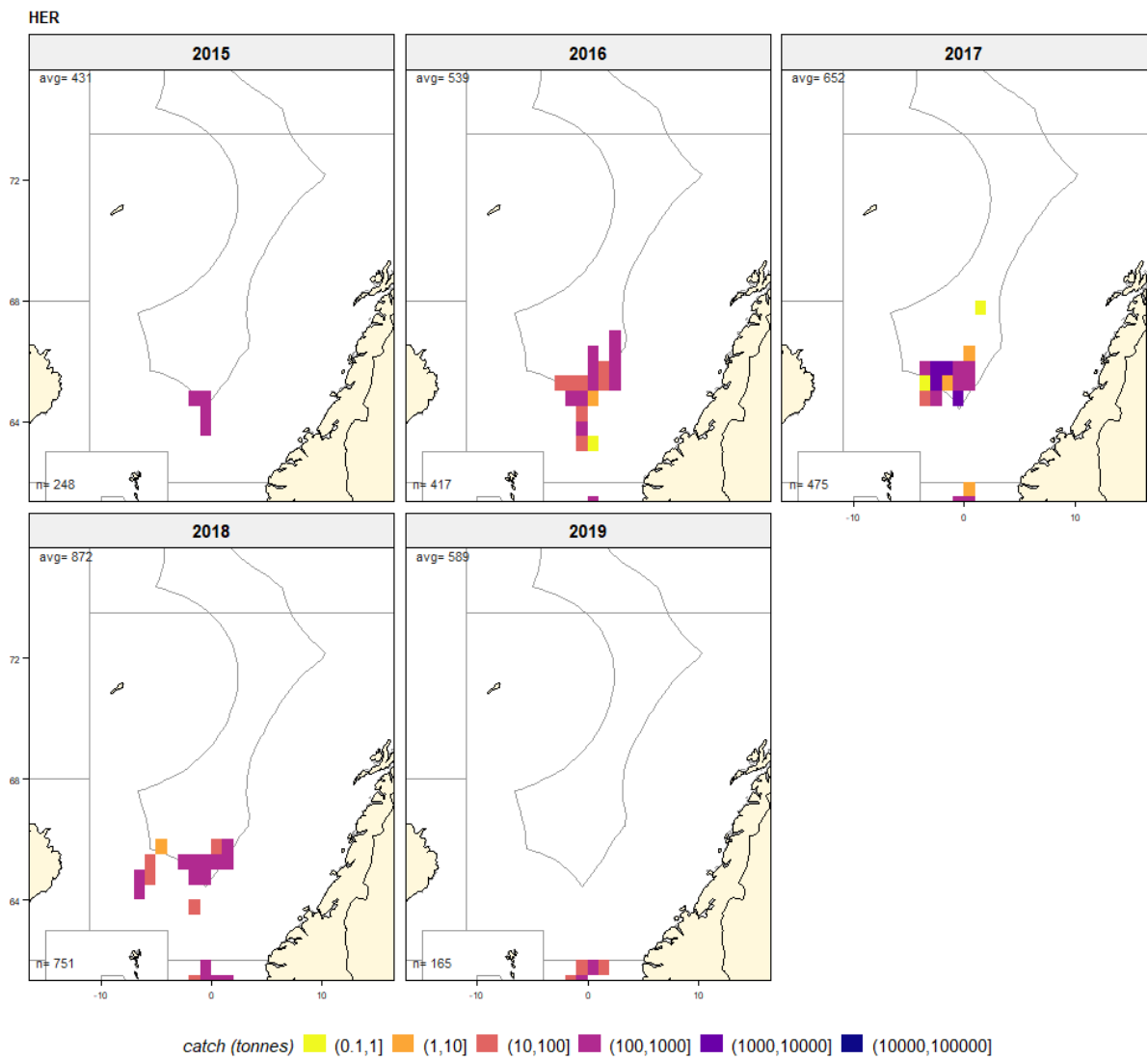


Figure 3.5.1: Herring catch per per square in PFA self-sampled widely distributed pelagic fisheries

Herring length distributions (27.2.a only)

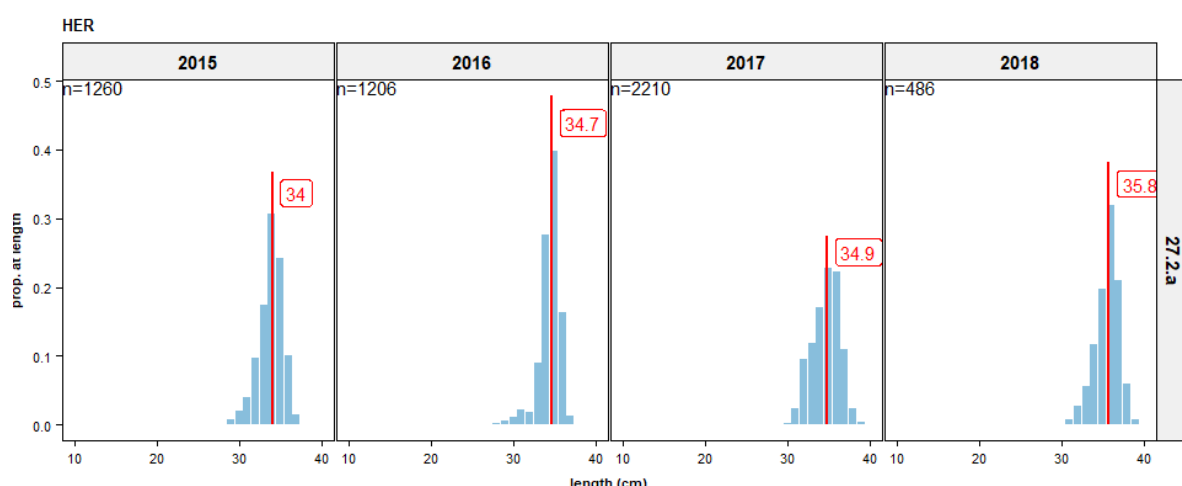


Figure 3.5.2: Herring length distributions by year (top) and by year and division (bottom) in PFA self-sampled widely distributed pelagic fisheries

Herring fishing depth

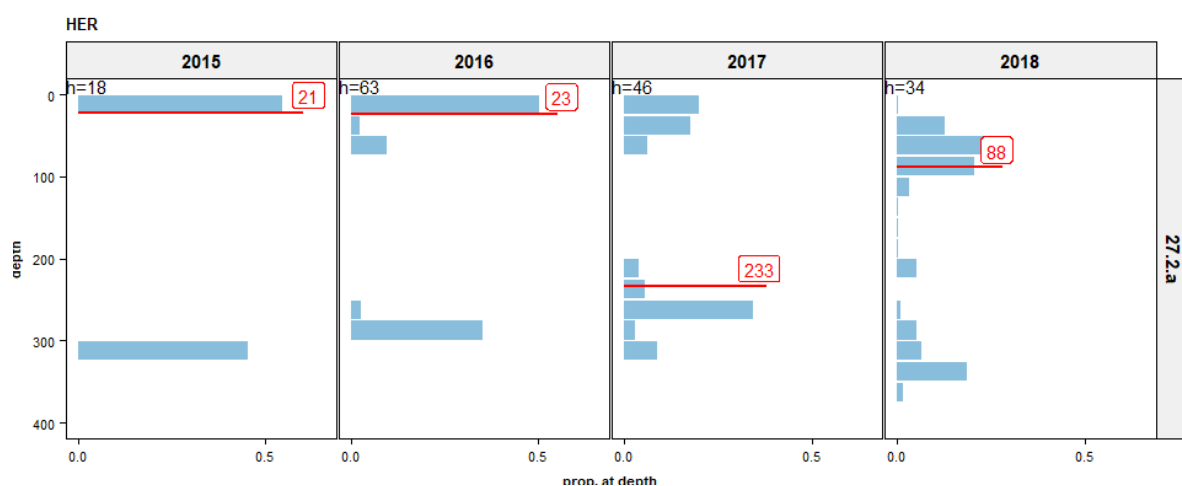


Figure 3.5.3: Herring depth distribution of catches by year and division in PFA self-sampled widely distributed pelagic fisheries. Median depth indicated in red. Number of hauls in black.

4 Discussion and conclusions

The definition of what constitutes ‘a fishery’ for a certain species is not well specified. In this report we selected all combination of vessel-trip-week where hauls were taken in a certain area and where the catch composition consisted of a minimum percentage of certain species and a minimum catch of 10 tons. Although for herring we aimed to select only

trips for Atlanto-scandian herring (in division 27.2.a) some trips with North Sea herring will probably also have been included.

5 Acknowledgements

The skippers, officers and the quality managers of many of the PFA vessels have put in a lot of effort to make the PFA the self-sampling work. Without their efforts, there would be no self-sampling.

6 More information

Please contact Martin Pastoors (mpastoors@pelagicfish.eu) if you would have any questions on the PFA self-sampling programme or the specific results presented here. Detailed length compositions (e.g. CSV files) can also be made available on request.