Commission for the Conservation of
Southern Bluefin Tuna

みなみまぐろ保存委員会

CCSBT-ERS/1905/04 (Rev 3)
Summaries from the 2018 ERSWG Data Exchange

Introduction

This paper presents summaries from the data provided for the ERSWG Data Exchange (EDE). ERSWG 10 tasked the Secretariat with providing summaries of the exchanged data to ERSWG meetings, noting that the data would be aggregated over Members. The summaries would include at least observed and actual effort, observer coverage rate, observed mortalities and estimated total mortalities. Summaries would be provided separately for CCSBT statistical areas and species/species groups. The tables and figures presented in this paper are mainly an update of those presented in paper CCSBT-ERS/1703/05 at ERSWG 12. However, some additions have been made to comply with requests from participants at ERSWG 12 and with the modified recommendations of the Effectiveness of Seabird Mitigation Measures Technical Group (SMMTG) agreed at ERSWG 11.

The EDE commenced in 2013 with data provided for 2010 to 2012. Data have been submitted yearly since then and now includes information up to and including 2017. The summaries in this paper are for all data held by the Secretariat and include an additional two years data to the summary presented at ERSWG 12, plus some revisions to previously included data. Table 1 summarises the data provided by Members. South Africa has not been able to provide data for 2010 and 2011 due to data quality issues.

CCSBT Circular #2019/023 provided a letter from Japan dated 28 March 2019, which stated: "*In December, 2018, National Research Institute of Far Seas Fisheries (NRIFS) informed FAJ that they have found suspicious and/or inconsistent descriptions on seabird and other species data in certain observer reports recorded on Japanese large-scale longline vessels fishing for southern bluefin tuna in high-latitude areas of the southern hemisphere. Upon this, FAJ started its investigation into such observer reports.*". Subsequently, in May 2019, Japan provided revised 2016 and 2017 observer data for the EDE. This reduced Japan's reported 2017 observer coverage by over one million hooks, which is over 50%.

*Table 1 – Summary of ERSWG Data Exchange data by Members. The European Union had no reported SBT catch from 2013-2017 and therefore had no data to submit for those years. * Indonesia has provided data for all years but has not been able to provide estimates of total fishing effort or estimates of total mortality.*

|	Australia	EU	Indonesia	Japan	Korea	New Zealand	South Africa	Taiwan
2010	✓	✗	✓*	✓	✓	✓	✗	✓
2011	✓	✗	✓*	✓	✓	✓	✗	✓
2012	✓	✗	✓*	✓	✓	✓	✓	✓
2013	✓	n/a	✓*	✓	✓	✓	✓	✓
2014	✓	n/a	✓*	✓	✓	✓	✓	✓
2015	✓	n/a	✓*	✓	✓	✓	✓	✓
2016	✓	n/a	✓*	✓	✓	✓	✓	✓
2017	✓	n/a	✓*	✓	✓	✓	✓	✓

The specifications of the EDE provide a template for the provision of data. The submissions received from Members followed the template but there were substantial differences in the level of species detail provided. Some Members[1] provided species specific data, while others[2] used the "species/species groups" defined within the EDE as the 'minimum taxonomic level at which information should be reported'. The summaries in this document are aggregated over Members, so these "species/species groups" are the finest common level of detail that can be presented (the groups are shown in Table 2).

Table 2 - Minimum taxonomic level at which information should be reported for the ERS Data Exchange (providing that such taxonomic detail is available).

Species/Species Group	Comments
Sharks	
Blue Shark	
Shortfin Mako Shark	
Porbeagle	
Other sharks	
Turtles	For sea turtles, the number of species is small (approximately 7), so it is feasible to report data by stratum for each species.
Species specific	*Data should be provided separately for each species*
Seabirds	For seabirds, there are a large number of species and it is often difficult to separately identify species by pictures only. Reporting of seabird data by species would contain identification errors.
Large albatrosses	*Including: Wandering, Tristan, New Zealand, Antipodean, Southern Royal, and Northern Royal*
Dark coloured albatrosses	*Including: Sooty and Light-mantled*
Other albatrosses	*Including: Black-browed, Campbell, Grey-headed, Atlantic yellow-nosed, Indian yellow-nosed, Buller's, Shy, Salvin's, Chatham and White-capped*
Giant petrels	*Including: White-chinned petrel, Grey petrel, Flesh-footed shearwater etc.*
Other seabirds	*Including: Skua etc.*

For reference, the CCSBT Statistical Areas are shown in Figure 1 below.

Figure 1 – CCSBT Statistical areas
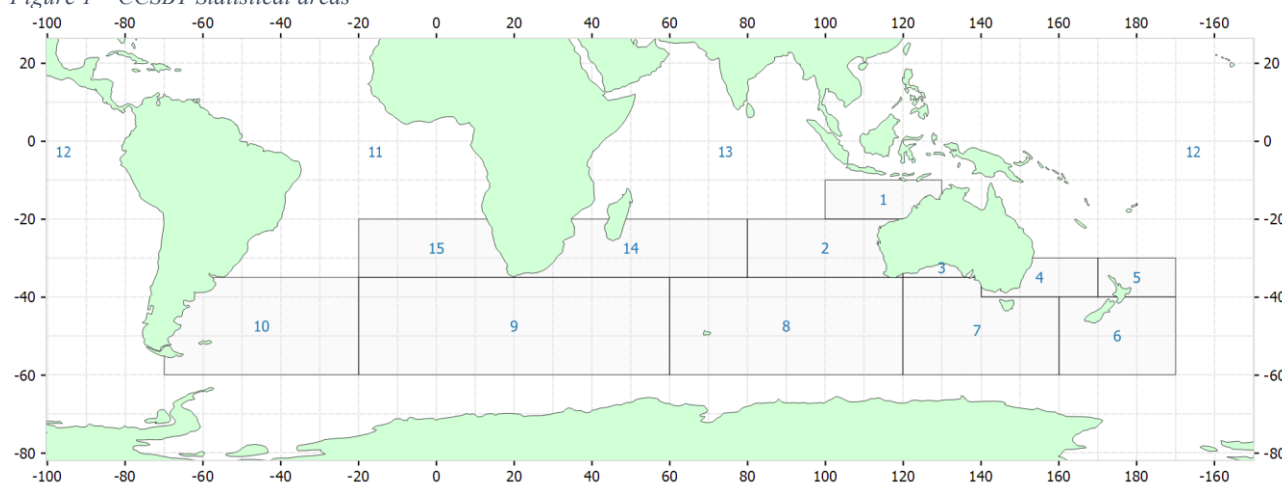
Effort Summaries

As per the rules of the EDE, the fishing effort provided by Members is defined as being effort by CCSBT authorised vessels for shots/sets where SBT was either targeted or caught.

Longline effort summaries are shown in Table 3 and as maps in Attachment A. On the maps the circle area is proportional to the total number of hooks set in that area, with the yellow slice representing the proportion of hooks that were observed. The scale is the same across years. Note that for 2013, area 6 effort does not include New Zealand (NZ) domestic fleet effort. NZ did not

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[1] Australia, Indonesia, Korea, New Zealand, South Africa, Taiwan.
[2] Japan

submit figures for total or observed effort for the domestic fleet in that area and year and advised that operational issues resulted in very low observer coverage (<1%). The Indonesian domestic fleet is also not included in the maps as Indonesia has not been able to provide estimates of total effort.

Over the 8-year period longline observer coverage was on average 12.4% of total effort, but coverage varied considerably by area and year. The observer coverage from 2012 to 2016 was over 12% for each year, an improvement on 2010 and 2011 where the average coverage was less than 10%. Observer coverage for 2017 was less than 10% due to Japan removing a substantial amount of its observer data.

Attachment M shows observer coverage by flag, gear, fleet, year and CCSBT statistical area. The final column, representativeness, is the proportion of statistical areas fished that reached the target of 10% observer coverage as per the SMMTG Recommendations. There are only two fleets that maintained a representativeness of 100% for all years fished (New Zealand and South African longline charter fleets)

Table 3 – Longline effort by year and statistical area, with observer coverage

Year	Statistical area	Total effort (1000s of hooks)	Observed effort (1000s of hooks)	Observer coverage
2010	2	12,456	1,960	15.7%
	4	4,007	66	1.6%
	5	1,345	88	6.5%
	6	739	408	55.2%
	7	1,304	0	0.0%
	8	7,396	615	8.3%
	9	19,659	1,152	5.9%
	14	3,978	102	2.6%
	2010 Total	*50,884*	*4,391*	*8.6%*
2011	2	103	0	0.0%
	4	4,208	191	4.5%
	5	2,539	170	6.7%
	6	683	365	53.5%
	7	1,986	147	7.4%
	8	6,118	589	9.6%
	9	10,515	1,066	10.1%
	2011 Total	*26,151*	*2,528*	*9.7%*
2012	2	1,944	623	32.0%
	4	3,452	306	8.9%
	5	2,269	93	4.1%
	6	1,112	498	44.8%
	7	2,451	110	4.5%
	8	4,214	280	6.6%
	9	11,329	1,609	14.2%
	14	1,254	479	38.2%
	15	40	0	0.0%
	2012 Total	*28,066*	*3,997*	*14.2%*
2013	2	3,704	994	26.8%
	4	2,952	200	6.8%
	5	1,364	83	6.1%
	6	450	349	77.6%
	7	3,216	227	7.1%
	8	6,184	670	10.8%
	9	12,445	1,252	10.1%
	14	7,330	1,209	16.5%
	15	100	0	0.0%
	2013 Total	*37,746*	*4,984*	*13.2%*
2014	2	6,722	1,036	15.4%
	4	2,087	251	12.0%
	5	1,123	213	18.9%
	6	1,137	589	51.8%
	7	2,759	426	15.4%
	8	9,043	976	10.8%
	9	10,394	777	7.5%
	14	5,628	1,104	19.6%
	15	122	4	3.0%
	2014 Total	*39,015*	*5,375*	*13.8%*

Year	Statistical area	Total effort (1000s of hooks)	Observed effort (1000s of hooks)	Observer coverage
2015	2	6,411	633	9.9%
	4	2,387	330	13.8%
	5	1,394	209	15.0%
	6	1,086	523	48.2%
	7	2,770	434	15.7%
	8	10,655	942	8.8%
	9	9,091	1,324	14.6%
	14	5,774	917	15.9%
	15	82	0	0.0%
	2015 Total	*39,651*	*5,312*	*13.4%*
2016	2	4,971	1,224	24.6%
	4	1,601	287	17.9%
	5	2,153	242	11.2%
	6	539	130	24.1%
	7	3,975	956	24.0%
	8	8,778	463	5.3%
	9	13,857	2,797	20.2%
	14	4,132	829	20.1%
	15	132	0	0.0%
	2016 Total	*40,139*	*6,928*	*17.3%*
2017	2	6,478	866	13.4%
	3	1	0	0.0%
	4	1,275	90	7.1%
	5	1,610	149	9.3%
	6	565	128	22.7%
	7	4,966	565	11.4%
	8	6,747	504	7.5%
	9	11,814	558	4.7%
	14	5,569	811	14.6%
	15	213	7	3.4%
	2017 Total	*39,238*	*3,678*	*9.4%*
Total		**300,889**	**37,192**	**12.4%**

Table 4 shows the percentage observer coverage of longline effort for areas that are considered to be important for seabirds. Statistical areas 2 and 8 have been combined, as have areas 5 and 6.

Table 4 – Longline observer coverage by year for areas that are important for seabirds.

	Year							
Statistical Area(s)	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
2/8	13%	9%	15%	17%	13%	9%	12%	10%
5/6	24%	17%	17%	24%	35%	30%	14%	13%
7	0%	7%	4%	7%	15%	16%	24%	11%
9	6%	10%	14%	10%	7%	15%	20%	5%

Purse seine effort summaries are shown in Table 5 and as maps in Attachment B. On the maps the circle area is proportional to the total number of sets in that area, with the yellow slice representing the proportion of sets that were observed. Observer coverage averages 15.5% over the 8-year period but was less than 10% in 2015.

Table 5 – Purse seine effort by year and statistical area, with observer coverage.

Year	Statistical area	Total effort (sets)	Observed effort (sets)	Observer coverage
2010	3	82	21	25.6%
	2010 Total	*82*	*21*	*25.6%*
2011	3	98	17	17.3%
	7	10	0	0.0%
	2011 Total	*108*	*17*	*15.7%*
2012	3	71	10	14.1%
	7	81	7	8.6%
	2012 Total	*152*	*17*	*11.2%*
2013	3	8	0	0.0%
	7	111	14	12.6%
	2013 Total	*119*	*14*	*11.8%*
2014	7	75	17	22.7%
	2014 Total	*75*	*17*	*22.7%*
2015	7	154	14	9.1%
	2015 Total	*154*	*14*	*9.1%*
2016	7	133	25	18.8%
	2016 Total	*133*	*25*	*18.8%*
2017	7	111	20	18.0%
	2017 Total	*111*	*20*	*18.0%*
Total		**934**	**145**	**15.5%**

Observed Mortality Summaries

Table 6 shows observed mortalities by year, statistical area, and species/species group for the SBT longline fishery, while attachments C and D map the distribution of observed mortalities for seabirds and sharks respectively. For the pie maps, the area of the pie is proportional to the total number of observed mortalities, with pie slices representing the proportion of each species/species group. The scale is the same across years.

The number of observed bird mortalities by area varies considerably from year to year but appears to be higher in recent years, which in some areas is at least partly due to the increase in observer coverage. The exception to this is 2017 where the number of observed bird mortalities are the lowest of the time series, but the number of observed hooks is also low. Note that a large proportion of mortalities are in the 'other albatross' and 'other seabirds' categories, some of which are unidentified seabirds that may belong in a different category.

The number of observed shark mortalities by area also varies considerably from year to year but apart from area 9 seems to have decreased overall from 2012 to 2017. This may not actually be the case since a large proportion of shark catch was not given a life status, see the charts and discussion on catch rates (and Attachment E). In addition to this, the Secretariat has learned that some Members have only been including discarded mortalities in their EDE figures, and have not included retained catch, while other Members have included both. This is mainly an issue for data provided in the older EDE format (data provided for calendar years prior to 2017) since the new format specifically includes retained catches, although some Members have not included retained catch when calculating mortality rates. Members should resolve this by agreeing on a standard reporting method. Providing historical data in the new EDE format helps to clarify how data were reported and help to separate commercial catches from bycatch.

Table 6 - Observed mortalities for the SBT longline fishery by year, statistical area and species/species group

Statistical area	Blue shark	Shortfin mako shark	Porbeagle	Other sharks	Turtles	Large albatross	Dark coloured albatross	Other albatross	Giant petrels	Other seabirds
1	79	0	6	261	2	0	0	0	0	0
2	404	28	0	69	0	0	1	23	1	1
4	251	10	0	2	0	2	0	5	0	0
5	1,272	65	148	2	0	0	0	9	2	1
6	2,547	18	76	28	0	0	0	47	0	0
7	0	0	0	0	0	0	0	0	0	0
8	429	16	42	20	0	1	3	8	3	1
9	1,168	65	280	118	0	16	5	74	20	220
14	51	33	0	0	0	0	0	0	0	0
2010 Total	*6,201*	*235*	*552*	*500*	*2*	*19*	*9*	*166*	*26*	*223*
1	2	0	0	52	2	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0
4	247	59	0	22	0	13	0	8	6	33
5	1,152	172	243	16	0	9	0	4	0	1
6	2,357	18	60	60	0	0	0	11	1	0
7	334	23	22	6	0	1	0	44	11	20
8	1,321	14	177	0	0	4	1	101	12	33
9	1,927	131	115	77	0	11	3	76	7	12
2011 Total	*7,340*	*417*	*617*	*233*	*2*	*38*	*4*	*244*	*37*	*99*
1	20	0	0	32	3	0	0	0	0	3
2	1,791	10	0	143	0	0	0	16	0	6
4	29	90	0	7	0	3	0	3	1	3
5	1,880	96	125	2	0	3	0	8	3	0
6	6,254	33	141	90	0	0	0	26	0	0
7	40	5	2	0	0	1	0	5	3	3
8	928	3	10	2	0	0	0	0	0	0
9	1,534	161	366	15	0	9	7	45	21	7
14	930	73	0	0	0	0	0	10	2	0
15	0	0	0	0	0	0	0	0	0	0
2012 Total	*13,406*	*471*	*644*	*291*	*3*	*16*	*7*	*113*	*30*	*22*
1	44	0	0	69	6	0	0	0	0	0
2	729	20	3	51	0	0	2	16	1	0
4	210	30	1	4	0	4	0	1	2	0
5	818	38	50	4	0	0	0	1	0	0
6	3,948	45	71	92	0	0	0	2	1	0
7	16	18	5	2	0	3	0	23	4	0
8	464	12	26	13	0	7	1	6	0	10
9	1,058	81	203	14	0	11	13	198	79	21
14	558	151	0	51	0	2	5	3	2	0
15	0	0	0	0	0	0	0	0	0	0
2013 Total	*7,845*	*395*	*359*	*300*	*6*	*27*	*21*	*250*	*89*	*31*
1	46	2	0	79	0	0	0	0	0	0
2	1,051	28	3	17	0	0	0	5	0	0
4	537	141	1	51	0	25	0	18	10	7
5	333	109	68	39	0	9	0	16	2	0
6	2,425	51	280	142	0	0	0	20	1	0
7	501	16	85	10	0	32	0	223	25	21
8	1,188	44	241	94	0	2	7	31	4	0
9	1,331	392	105	30	0	5	3	107	26	33
14	656	96	0	185	0	0	2	7	2	1
15	68	462	0	0	0	0	0	0	0	0
2014 Total	*8,136*	*1,341*	*783*	*647*	*0*	*73*	*12*	*427*	*70*	*62*

Statistical area	Blue shark	Shortfin mako shark	Porbeagle	Other sharks	Turtles	Large albatross	Dark coloured albatross	Other albatross	Giant petrels	Other seabirds
1	124	1	0	146	0	0	0	0	0	7
2	57	20	0	4	0	0	1	4	0	0
4	302	47	26	39	0	16	1	66	3	0
5	700	37	99	9	0	2	0	7	1	0
6	567	27	75	73	0	1	0	11	2	0
7	279	46	102	9	0	13	6	295	75	7
8	563	27	108	16	0	1	1	76	11	2
9	656	74	160	8	0	24	31	245	38	14
14	280	102	0	9	0	0	5	8	0	0
15	0	0	0	0	0	0	0	0	0	0
2015 Total	*3,528*	*381*	*570*	*313*	*0*	*57*	*45*	*712*	*130*	*30*
1	77	1	0	186	11	0	0	0	0	0
2	262	27	0	1	0	0	1	5	0	0
4	125	33	3	23	0	14	0	72	0	0
5	918	92	233	60	0	1	0	15	0	0
6	326	18	119	6	0	2	0	89	10	0
7	427	37	121	15	0	23	3	681	118	1
8	407	25	13	18	0	5	29	61	9	0
9	2,155	64	138	62	0	18	28	456	102	96
14	641	126	0	8	0	0	1	1	0	0
15	0	0	0	0	0	0	0	0	0	0
2016 Total	*5,338*	*423*	*627*	*379*	*11*	*63*	*62*	*1,380*	*239*	*97*
1	23	0	0	43	0	0	0	0	0	0
2	644	72	0	70	0	0	1	1	0	20
3	0	0	0	0	0	0	0	0	0	0
4	53	20	1	11	0	0	0	2	0	0
5	713	47	254	14	0	0	0	2	2	0
6	305	16	127	16	0	1	0	20	8	0
7	674	28	31	18	0	1	0	22	4	0
8	906	13	270	42	0	2	1	10	1	0
9	990	278	137	107	0	0	0	1	0	0
14	236	162	0	11	0	0	0	2	1	0
15	285	144	0	0	0	0	0	0	0	0
2017 Total	*4,829*	*780*	*820*	*332*	*0*	*4*	*2*	*60*	*16*	*20*

Table 7 shows observed mortalities for all seabirds combined, by year and statistical area. 83% of all observed bird mortalities occurred in areas 7, 8, and 9.

Table 7 - Observed mortalities for the SBT longline fishery for all seabirds combined by year and statistical area

Statistical Area	Year 2010	2011	2012	2013	2014	2015	2016	2017	All Years Total	Average
1	0	0	3	0	0	7	0	0	**10**	1
2	26	0	22	19	5	5	6	22	**105**	13
3	-	-	-	-	-	-	-	0	**0**	0
4	7	60	10	7	60	86	86	2	**318**	40
5	12	14	14	1	27	10	16	4	**98**	12
6	47	12	26	3	21	14	101	29	**253**	32
7	0	76	12	30	301	396	826	27	**1668**	209
8	16	151	0	24	44	91	104	14	**444**	56
9	335	109	89	322	174	352	700	1	**2082**	260
14	0	0	12	12	12	13	2	3	**54**	7
15	-	-	0	0	0	0	0	0	**0**	0
Total	443	422	188	418	644	974	1841	102	**5032**	629

Table 8 shows observed mortalities by year, statistical area, and species/species group for the SBT purse seine fishery. There were no observed mortalities reported.

Table 8 - Observed mortalities for the SBT purse seine fishery by year, statistical area and species/species group

Year	Statistical area	Blue shark	Shortfin mako shark	Porbeagle	Other sharks	Turtles	Large albatross	Dark coloured albatross	Other albatross	Giant petrels	Other seabirds
2010	3	0	0	0	0	0	0	0	0	0	0
	2010 Total	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
2011	3	0	0	0	0	0	0	0	0	0	0
	7	0	0	0	0	0	0	0	0	0	0
	2011 Total	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
2012	3	0	0	0	0	0	0	0	0	0	0
	7	0	0	0	0	0	0	0	0	0	0
	2012 Total	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
2013	3	0	0	0	0	0	0	0	0	0	0
	7	0	0	0	0	0	0	0	0	0	0
	2013 Total	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
2014	7	0	0	0	0	0	0	0	0	0	0
	2014 Total	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
2015	7	0	0	0	0	0	0	0	0	0	0
	2015 Total	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
2016	7	0	0	0	0	0	0	0	0	0	0
	2016 Total	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
2017	7	0	0	0	0	0	0	0	0	0	0
	2017 Total	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Total		*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

Observed Catch and Mortality Rate Summaries

Attachment E shows observed catch rates (numbers caught per thousand hooks) by year for each species group. The bars are divided by fate; red for observed mortalities, green for observed live releases, and grey for 'unknown life status' (for each species Members provide total numbers caught, the number of individuals observed to be dead, and the number observed to be released alive. The 'unknown life status' number is the calculated discrepancy between 'total caught' – ('observed dead' + 'observed released alive')).

Attachment F shows observed catch rates by species group, year, and statistical area.

Attachments G and H map mortality rates for seabirds and sharks respectively, while attachments I and J map capture rates for seabirds and sharks. The areas of the pies are proportional to the total mortality rate (G and H) or capture rate (I and J) of all species combined, with pie slices representing the proportion of each species/species group. The scale is the same across years for each map series. Note that in attachments H and J the data for statistical area 15 have been removed for 2014 and 2017. These points had extremely high capture and mortality rates for shortfin mako and blue shark but was for less than 10000 observed hooks.

Observed catch and mortality rates for seabirds are similar due to the low proportion of live releases. The overall bird rates were highest from 2014 to 2016 but appear to be lower in 2017.

Observed shark mortality rates appear to have declined from 2012 to 2015 but have increased since then, while overall catch rates by year remain high according to Attachment E. This is possibly due to a large proportion of the observed catch not being given a life status (the middle bar in Attachment E). If a large proportion of these sharks did not survive then the mortality rates for 2015 would not be low.

Summaries of the Estimated Total Number of Mortalities

The ERSWG template includes a column for the estimated total number of mortalities per year/stratum. This particular column was provided for all years by four of the seven Members whose data are used in this report, not provided for any years by one Member, and partly provided for recent years by two Members. Where the estimated total number of mortalities was provided, Members mostly used a simple scaling of the observed number of mortalities according to the observer coverage of the stratum and rounded fractions down to the next integer (even for fractions greater than 0.5).

For the summaries in this paper, the estimated total number of mortalities for the three Members that did not provide the column were calculated by scaling the number of observed mortalities by the observer coverage of the stratum and rounding down to the nearest whole number, to be consistent with the data provided by the other Members.

Due to the simple, non-model based, approach used to estimate the total number of mortalities, and the low level of observer coverage in many strata which results in a high scaling factor, the numbers should be treated with caution.

Table 9 shows estimated total mortalities by year, statistical area, and species/species group for the SBT longline fishery, while attachments K and L map the distribution of estimated total mortalities for seabirds and sharks respectively. As with observed mortalities, the areas of the pies are proportional to the total number of estimated mortalities, with pie slices representing the proportion of each species/species group. The scale is the same across years.

In Table 9, the total shark mortalities for 2015 is estimated to be less than half the yearly average from 2012-2014, but this could be at least partially explained by the high proportion of sharks reported without a life status (see Attachment E). If we were to map the estimated numbers of

sharks that were not 'live releases', then 2015 would show much higher numbers relative to the other years.

The distribution of total estimated bird mortalities by area is similar to the distribution of observed mortalities, and also varies considerably from year to year. There are also relatively large numbers of seabirds in the 'other albatross' and 'other seabirds' categories, some of which are unidentified seabirds that may belong in a different category.

The distribution of total estimated shark mortalities by area is also quite similar to the distribution of observed shark mortalities and also varies considerably from year to year, so the same comment applies that it is difficult to see clear visual patterns other than blue shark being caught in much larger numbers than any other shark species.

While there were observed turtle mortalities in area 1, the total estimated mortalities of turtles could not be calculated because total effort was not provided by the Member concerned.

Table 9 – Estimated total mortalities for the SBT longline fishery by year, statistical area, and species/species group

Year	Statistical area	Blue shark	Shortfin mako shark	Porbeagle	Other Sharks	Turtles	Large albatross	Dark coloured albatross	Other albatross	Giant petrels	Other seabirds
2010	1	0	0	0	0	0	0	0	0	0	0
	2	2,533	175	0	432	0	0	6	142	6	6
	4	3,448	664	0	132	0	255	0	637	0	0
	5	14,326	732	1,666	22	0	0	0	100	22	11
	6	11,157	102	313	34	0	0	0	498	0	0
	8	4,584	131	449	185	0	10	24	80	32	8
	9	14,774	861	2,995	1,791	0	189	145	807	572	2,920
	14	1,987	1,286	0	0	0	0	0	0	0	0
	2010 Total	*52,809*	*3,951*	*5,423*	*2,596*	*0*	*454*	*175*	*2,264*	*632*	*2,945*
2011	1	0	0	0	0	0	0	0	0	0	0
	4	5,681	1,248	0	539	0	331	0	204	153	820
	5	12,361	2,108	2,461	273	0	172	0	60	0	20
	6	3,204	24	81	81	0	0	0	14	1	0
	7	4,526	311	298	81	0	13	0	596	149	271
	8	6,281	66	841	0	0	19	4	480	57	156
	9	20,966	1,702	846	566	0	80	22	559	51	87
	2011 Total	*53,019*	*5,459*	*4,527*	*1,540*	*0*	*615*	*26*	*1,913*	*411*	*1,354*
2012	1	0	0	0	0	0	0	0	0	0	0
	2	4,423	30	0	0	0	0	0	48	0	0
	4	363	892	0	77	0	37	0	37	12	37
	5	20,936	1,109	1,393	22	0	33	0	88	33	0
	6	28,514	183	1,311	106	0	0	0	42	0	0
	7	890	111	44	0	0	22	0	111	66	66
	8	8,351	26	89	17	0	0	0	0	0	0
	9	12,977	956	3,824	135	0	74	73	424	182	69
	14	2,241	168	0	0	0	0	0	23	4	0
	2012 Total	*78,695*	*3,475*	*6,661*	*357*	*0*	*166*	*73*	*773*	*297*	*172*
2013	1	0	0	0	0	0	0	0	0	0	0
	2	2,784	76	3	192	0	0	7	59	3	0
	4	931	501	4	17	0	79	0	19	39	0
	5	10,652	435	703	60	0	0	0	15	0	0
	6	5,090	58	92	119	0	0	0	2	1	0
	7	226	255	70	28	0	42	0	326	56	0
	8	5,911	163	330	149	0	77	11	39	0	110
	9	12,621	624	1,207	130	0	94	118	1,821	744	191
	14	3,231	274	0	356	0	14	36	21	14	0
	2013 Total	*41,446*	*2,386*	*2,409*	*1,051*	*0*	*306*	*172*	*2,302*	*857*	*301*
2014	1	0	0	0	0	0	0	0	0	0	0
	2	9,311	273	18	103	0	0	0	30	0	0
	4	4,253	1,117	7	366	0	195	0	140	78	54
	5	2,913	812	635	169	0	34	0	77	12	9
	6	4,232	388	2,097	270	0	0	0	86	67	0
	7	3,248	103	551	64	0	207	0	1,445	162	136
	8	13,863	616	2,982	839	0	22	28	408	45	0
	9	10,139	2,502	627	1,018	0	29	17	638	155	197
	14	3,164	115	0	981	0	0	10	36	10	5
	15	2,246	15,262	0	0	0	0	0	0	0	0
	2014 Total	*53,369*	*21,188*	*6,917*	*3,810*	*0*	*487*	*55*	*2,860*	*529*	*401*

Year	Statistical area	Blue shark	Shortfin mako shark	Porbeagle	Other Sharks	Turtles	Large albatross	Dark coloured albatross	Other albatross	Giant petrels	Other seabirds
2015	1	0	0	0	0	0	0	0	0	0	0
	2	552	193	0	38	0	0	10	40	0	0
	4	2,049	345	173	265	0	106	6	444	19	0
	5	8,232	407	1,164	107	0	9	0	83	4	0
	6	2,359	267	879	174	0	22	0	97	23	0
	7	1,780	293	651	57	0	82	38	1,882	478	44
	8	6,425	303	1,245	185	0	8	12	875	127	23
	9	5,799	350	782	41	0	116	151	1,206	184	70
	14	1,476	244	0	61	0	0	34	62	0	0
	2015 Total	*28,672*	*2,402*	*4,894*	*928*	*0*	*343*	*251*	*4,688*	*835*	*137*
2016	1	0	0	0	0	0	0	0	0	0	0
	2	1,061	109	0	4	0	0	4	20	0	0
	4	669	178	15	123	0	72	0	375	0	0
	5	6,012	643	1,435	695	0	12	0	168	0	0
	6	1,353	75	494	25	0	8	0	369	42	0
	7	1,767	151	503	75	0	94	12	2,796	484	4
	8	10,209	788	563	154	0	216	1,182	2,495	353	0
	9	11,675	895	489	237	0	64	110	1,745	374	335
	14	2,792	291	0	42	0	0	5	5	0	0
	2016 Total	*35,538*	*3,130*	*3,499*	*1,355*	*0*	*466*	*1,314*	*7,974*	*1,253*	*339*
2017	1	0	0	0	0	0	0	0	0	0	0
	2	3,809	284	0	329	0	0	0	7	0	15
	4	900	171	0	158	0	0	0	34	0	0
	5	3,996	263	1,424	78	0	0	0	12	12	0
	6	1,346	71	560	70	0	4	0	87	35	0
	7	5,944	221	212	149	0	161	0	189	35	0
	8	18,424	199	6,310	416	0	47	9	203	23	0
	9	8,006	3,447	754	589	0	0	0	6	0	0
	14	1,051	227	0	81	0	0	0	10	9	0
	15	8,384	4,236	0	0	0	0	0	0	0	0
	2017 Total	*51,861*	*9,119*	*9,260*	*1,871*	*0*	*212*	*9*	*548*	*114*	*15*

Table 10 shows the estimated total mortalities for all seabirds combined. As with table 7 regarding observed mortalities, areas 7, 8, and 9 have the highest total mortalities, but area 4 also has appreciable mortalities.

Table 10 – Estimated total mortalities for the SBT longline fishery for all seabirds combined by year and statistical area

Statistical Area	Year								All Years	
	2010	2011	2012	2013	2014	2015	2016	2017	Total	Average
1	-	-	-	-	-	-	-	-	**-**	-
2	160	-	48	69	30	50	24	22	**404**	58
4	892	1508	123	137	467	575	447	34	**4183**	523
5	133	252	154	15	132	96	180	24	**986**	123
6	498	15	42	3	153	142	419	126	**1398**	175
7	-	1029	265	424	1950	2524	3390	385	**9967**	1424
8	154	716	0	237	503	1045	4246	281	**7182**	898
9	4633	799	822	2968	1036	1727	2628	6	**14619**	1827
14	0	0	27	85	61	96	11	19	**298**	37
Total	6470	4319	1481	3938	4332	6254	11345	897	**39037**	4880

Table 11 shows estimated total mortalities by year, statistical area, and species/species group for the SBT purse seine fishery. There were no observed mortalities, so the total estimated mortalities are zero for this fishery.

Table 11 - Estimated total mortalities for the SBT purse seine fishery by year, statistical area and **species/species group**

Year	Statistical area	Blue shark	Shortfin mako shark	Porbeagle	Other sharks	Turtles	Large albatross	Dark coloured albatross	Other albatross	Giant petrels	Other seabirds
2010	3	0	0	0	0	0	0	0	0	0	0
	2010 Total	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
2011	3	0	0	0	0	0	0	0	0	0	0
	7	0	0	0	0	0	0	0	0	0	0
	2011 Total	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
2012	3	0	0	0	0	0	0	0	0	0	0
	7	0	0	0	0	0	0	0	0	0	0
	2012 Total	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
2013	3	0	0	0	0	0	0	0	0	0	0
	7	0	0	0	0	0	0	0	0	0	0
	2013 Total	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
2014	7	0	0	0	0	0	0	0	0	0	0
	2014 Total	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
2015	7	0	0	0	0	0	0	0	0	0	0
	2015 Total	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
2016	7	0	0	0	0	0	0	0	0	0	0
	2016 Total	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
2017	7	0	0	0	0	0	0	0	0	0	0
	2017 Total	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

Summaries of Observed Effort with Specific Mitigation Measures

After ERSWG11, Members were required to provide the proportion of effort with specific mitigation measures. These have been aggregated over all fleets and statistical areas and are summarised in Table 12 below for 2014 to 2017 (these data are not available for earlier years). The column for 'Mix of 2 measures includes effort where two measures were used at all times but switched from night setting/tori pole to tori pole/branch lines after dawn. 2016 shows the highest proportion of effort with a single, or no, measure being used.

Table 12 - Proportions of observed effort with specific mitigation measures by year.

|	Tori pole + Night setting	Tori pole + weighted branchline	Night setting + weighted branchline	Tori pole + night setting + weighted branchline	None	Single measure	Mix of 2 measures	Other
2014	22.8%	57.0%	0.0%	6.5%	0.0%	13.7%	0.0%	0.0%
2015	35.3%	27.3%	2.5%	10.8%	0.0%	0.7%	23.5%	0.0%
2016	37.1%	15.0%	0.3%	17.0%	3.2%	27.5%	0.0%	0.0%
2017	50.1%	23.2%	0.0%	20.2%	0.2%	6.4%	0.0%	0.0%
Total	**35.3%**	**30.1%**	**0.7%**	**13.3%**	**1.1%**	**13.7%**	**5.9%**	**0.0%**

Table 13 summarises the proportion of observed effort with specific mitigation measures by year and statistical area.

Table 13 - Proportions of observed effort with specific mitigation measures by year and CCSBT statistical area.

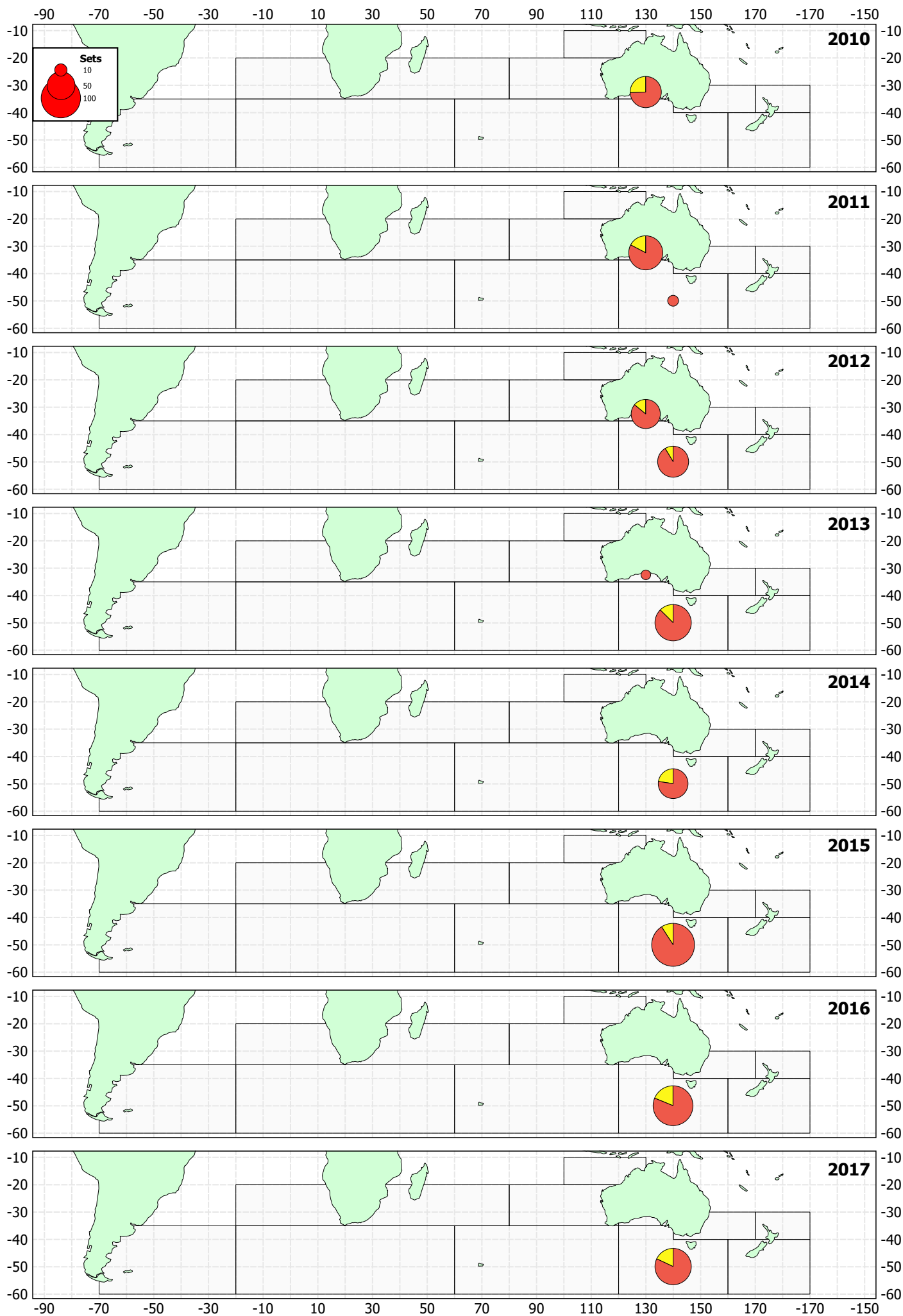| Year	Statistical Area	Tori pole + Night setting	Tori pole + weighted branchline	Night setting + weighted branchline	Tori pole + night setting + weighted branchline	None	Single Measure	Mix of 2 measures	Other
2014	1	-	-	-	-	-	-	-	100.0%
	2	21.1%	78.9%	-	-	-	-	-	-
	4	6.2%	5.2%	-	0.4%	-	88.3%	-	-
	5	5.8%	60.6%	-	-	-	33.6%	-	-
	6	99.7%	-	-	-	-	0.3%	-	-
	7	17.3%	-	-	-	-	82.7%	-	-
	8	29.7%	70.1%	-	-	-	0.2%	-	-
	9	3.6%	51.2%	-	33.8%	-	11.4%	-	-
	14	-	92.8%	-	7.2%	-	-	-	-
	15	-	-	-	100.0%	-	-	-	-
	2014 total	**22.2%**	**55.6%**	**-**	**6.3%**	**-**	**13.4%**	**-**	**2.6%**
2015	1	-	-	-	-	-	-	-	100.0%
	2	59.0%	25.6%	7.5%	7.8%	-	-	-	-
	4	1.6%	68.1%	-	3.5%	-	-	26.8%	-
	5	8.6%	74.2%	-	-	-	17.2%	-	-
	6	99.5%	-	-	-	-	0.5%	-	-
	7	0.3%	31.5%	-	-	-	-	68.2%	-
	8	42.7%	15.2%	-	10.3%	-	-	31.8%	-
	9	11.6%	40.0%	-	5.8%	-	-	42.6%	-
	14	43.6%	10.6%	9.0%	36.8%	-	-	-	-
	2015 total	**34.3%**	**26.6%**	**2.4%**	**10.5%**	**-**	**0.7%**	**22.9%**	**2.7%**
2016	1	-	-	-	-	-	-	-	100.0%
	2	48.5%	7.6%	-	43.9%	-	-	-	-
	4	18.2%	8.9%	-	6.7%	1.8%	64.4%	-	-
	5	39.4%	-	-	-	8.9%	51.6%	-	-
	6	83.6%	-	-	-	-	16.4%	-	-
	7	16.0%	13.4%	-	4.6%	-	66.0%	-	0.0%
	8	37.2%	3.8%	-	28.0%	-	31.0%	-	-
	9	28.1%	25.9%	0.7%	9.8%	6.9%	28.5%	-	0.0%
	14	73.3%	5.9%	-	20.8%	-	-	-	-
	2016 total	**36.6%**	**14.8%**	**0.3%**	**16.8%**	**-**	**27.1%**	**-**	**1.4%**
2017	1	-	-	-	-	-	-	-	100.0%
	2	80.1%	2.0%	-	9.4%	-	-	-	8.5%
	4	-	57.0%	-	43.0%	-	-	-	-
	5	89.6%	-	-	-	-	10.4%	-	-
	6	99.2%	-	-	-	-	0.8%	-	-
	7	11.1%	45.0%	-	29.7%	-	14.2%	-	-
	8	65.9%	3.2%	-	2.2%	1.3%	27.4%	-	-
	9	2.1%	90.9%	-	7.0%	-	-	-	-
	14	51.4%	0.5%	-	48.1%	-	-	-	-
	15	-	-	-	100.0%	-	-	-	-
	2017 Total	**48.6%**	**22.5%**	**-**	**19.6%**	**0.2%**	**6.2%**	**-**	**3.0%**

Prepared by the Secretariat
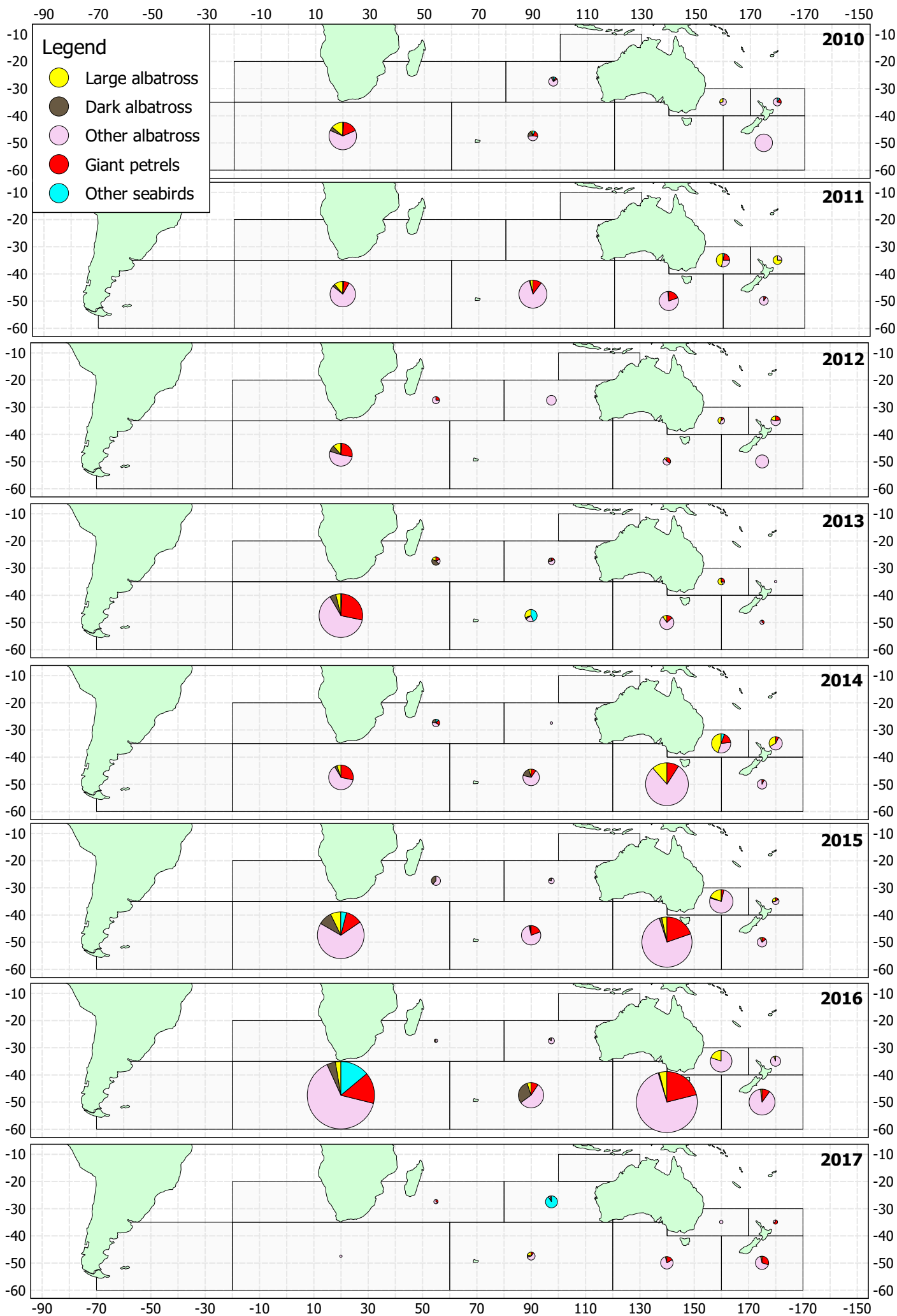
Attachment A

Longline SBT effort showing observer coverage (yellow)
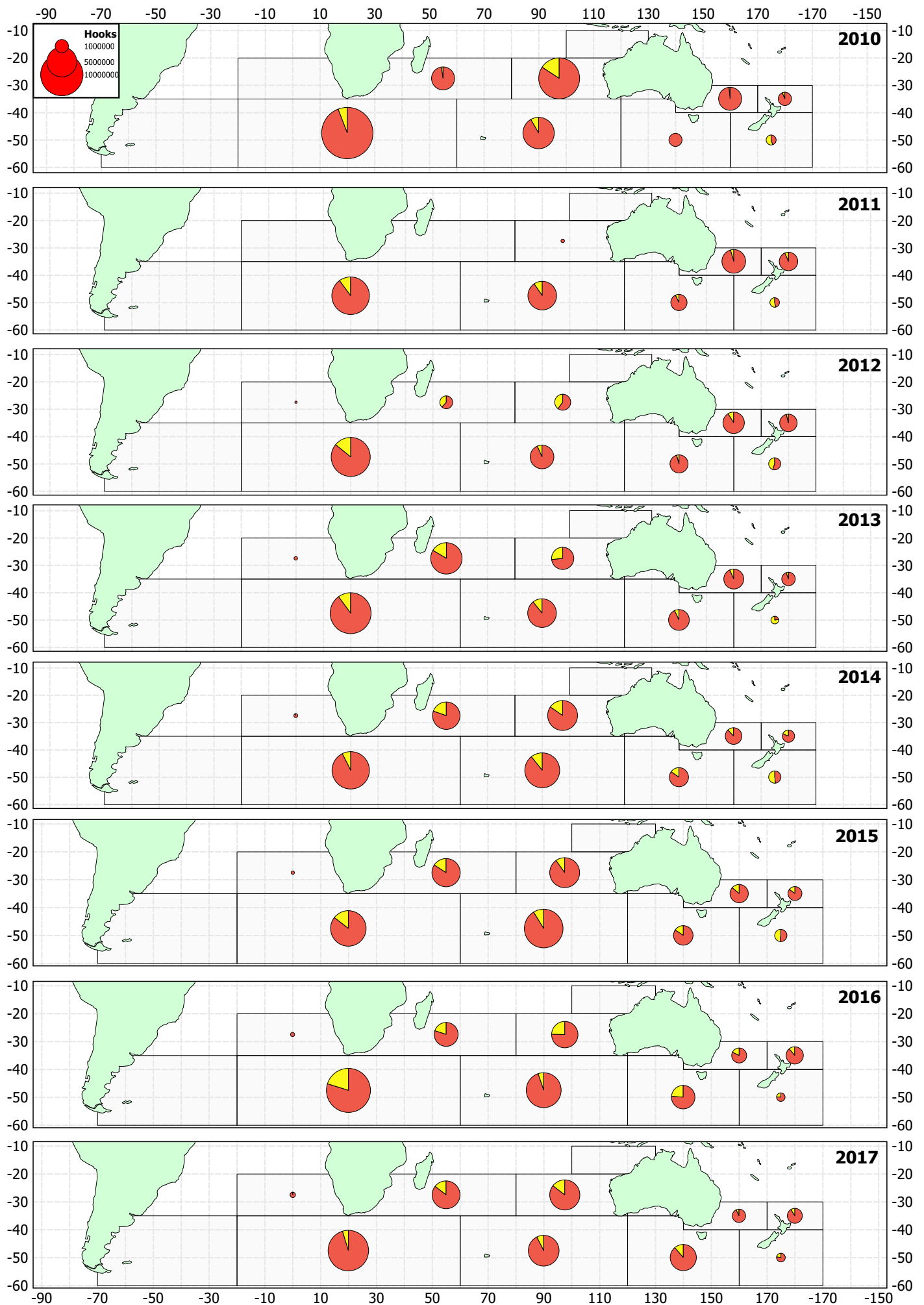
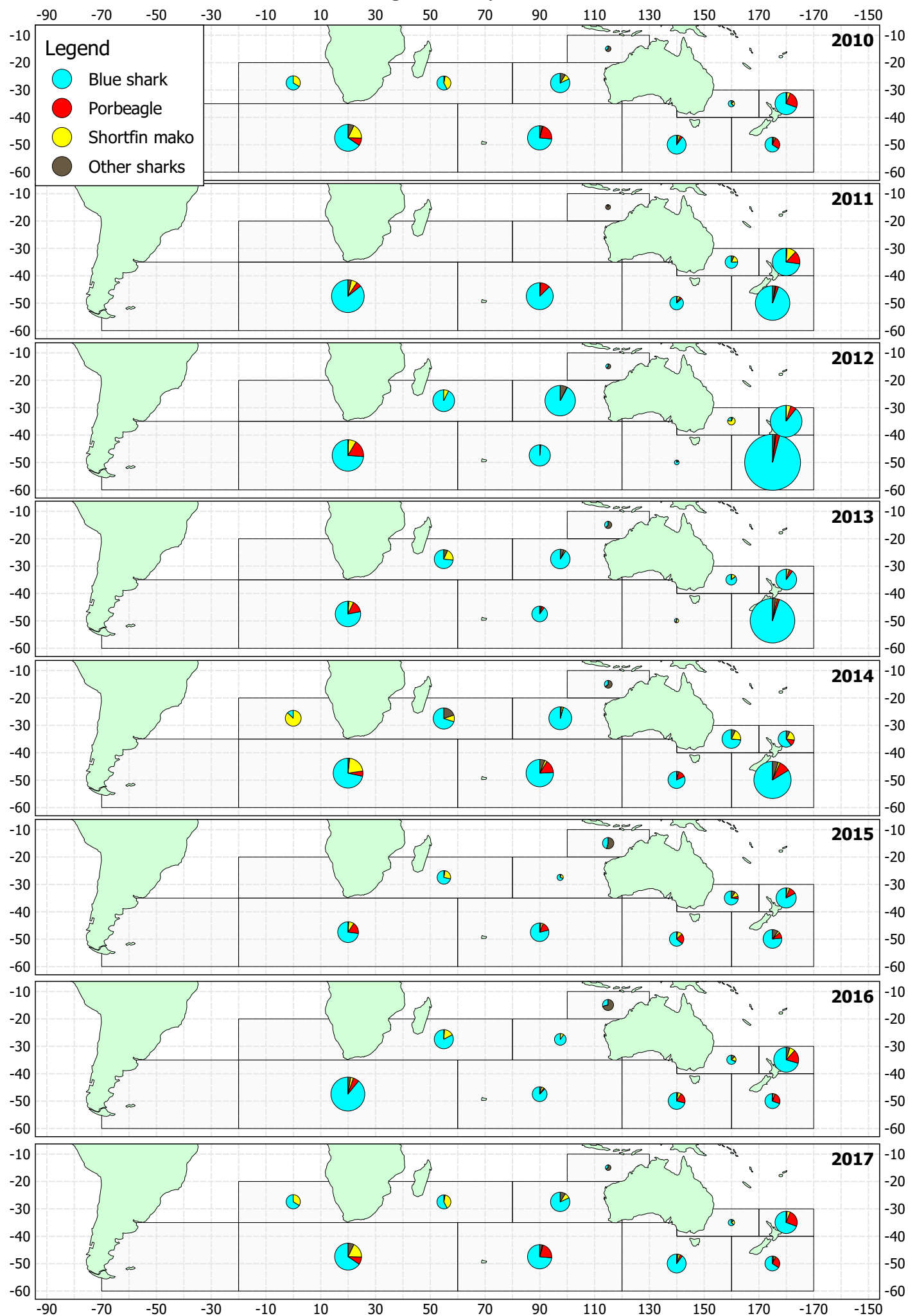# Purse seine SBT effort, showing observer coverage (yellow)

Observed bird mortalities for the SBT longline fishery

Legend
- Large albatross
- Dark albatross
- Other albatross
- Giant petrels
- Other seabirds

2010
2011
2012
2013
2014
2015
2016
2017

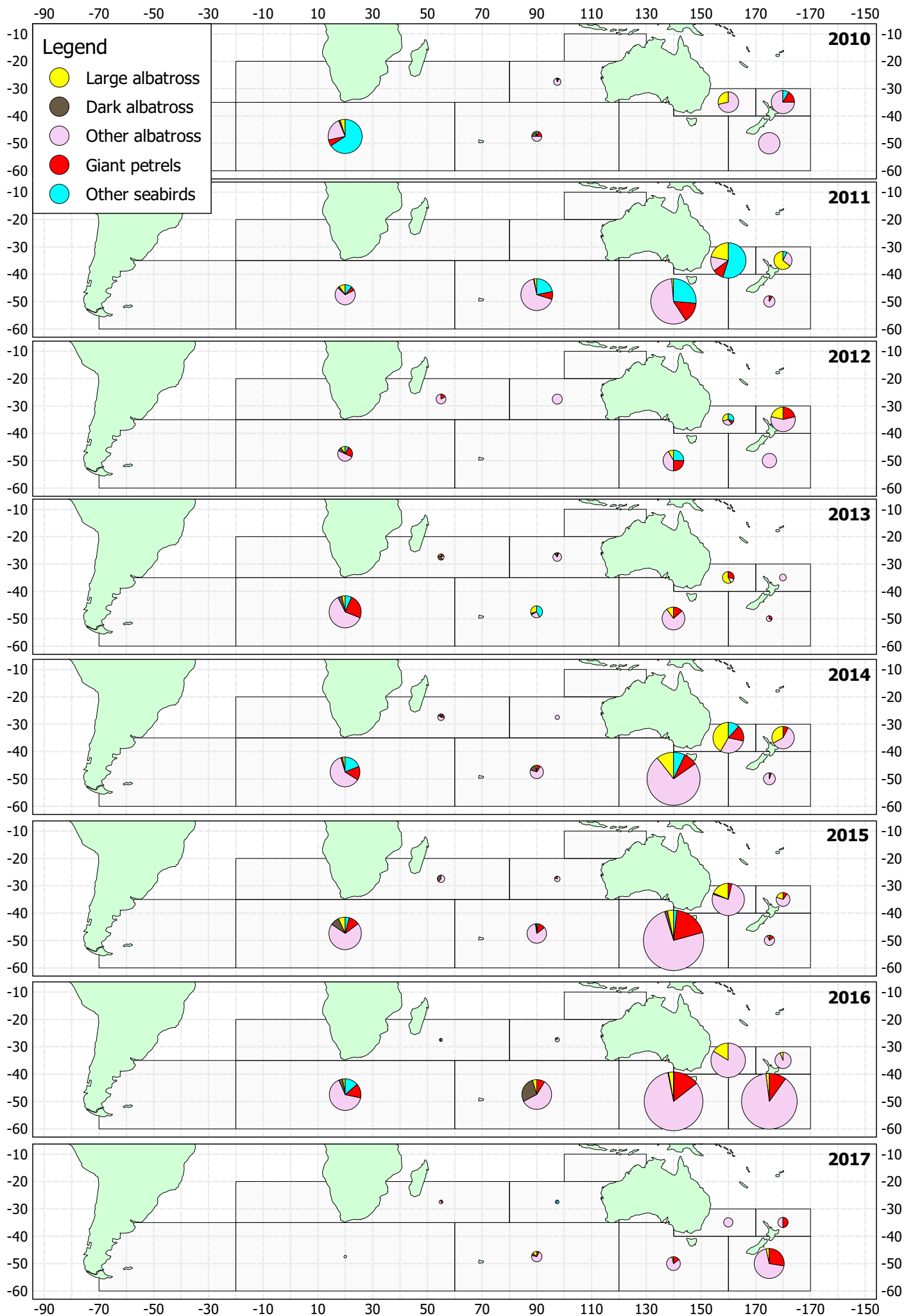# Observed shark mortalities for the SBT longline fishery

Observed capture rates (numbers per 1000 hooks) with proportions of observed mortalities (red), observed live releases (green) and unspecified life status (grey) for the SBT longline fishery by year and species/species group
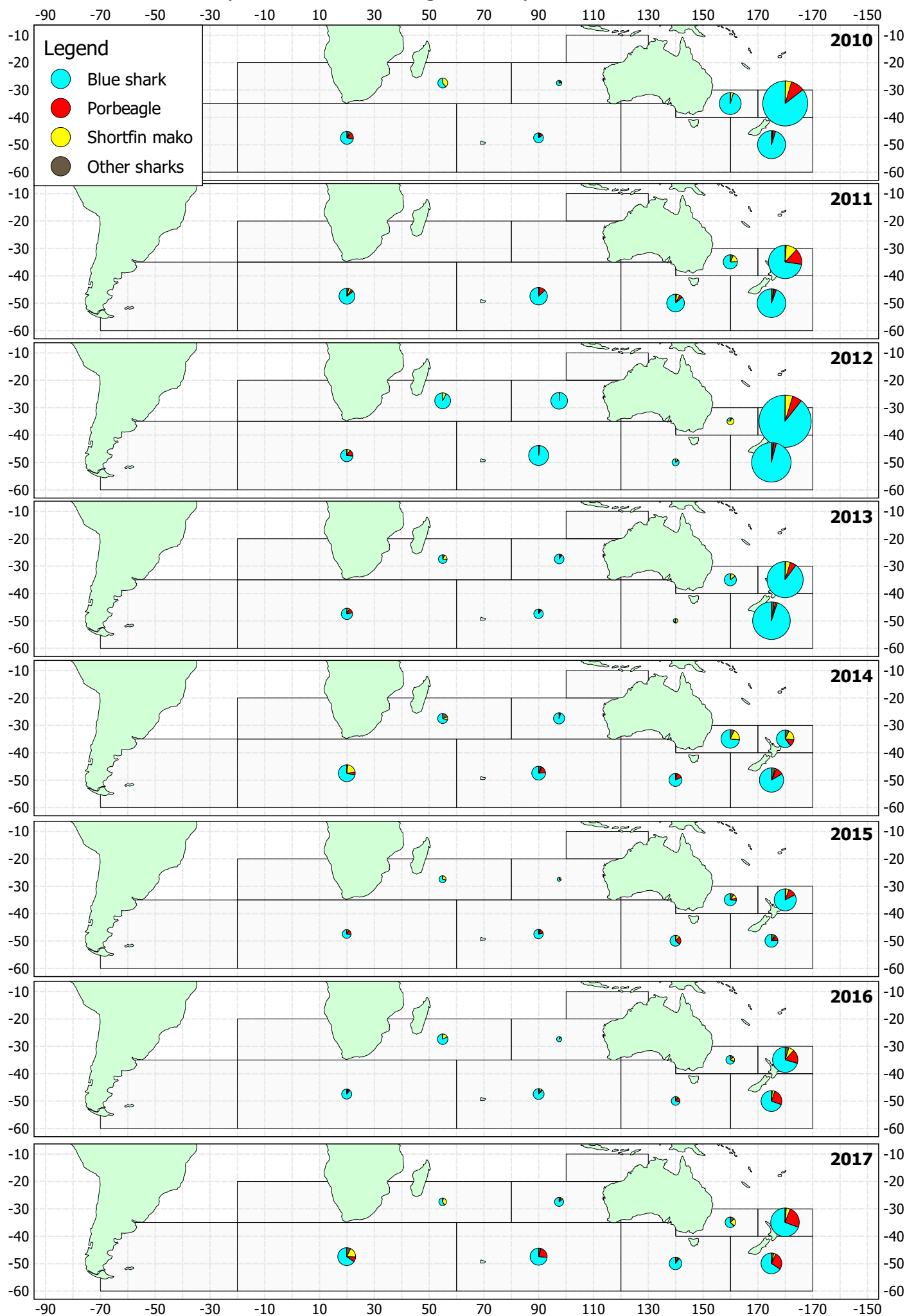
Observed catch rates for the SBT longline fishery by year, statistical area and species/species group
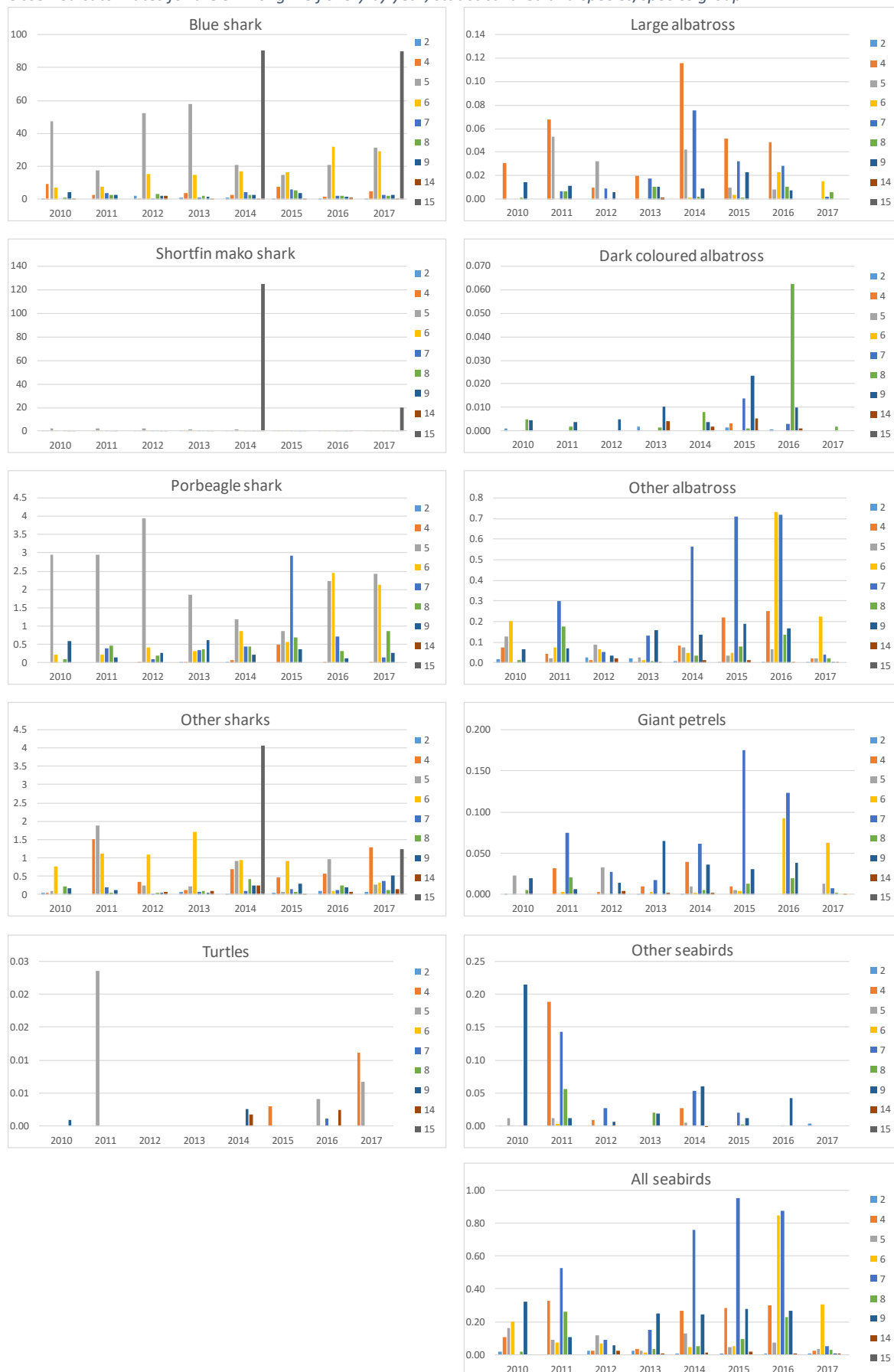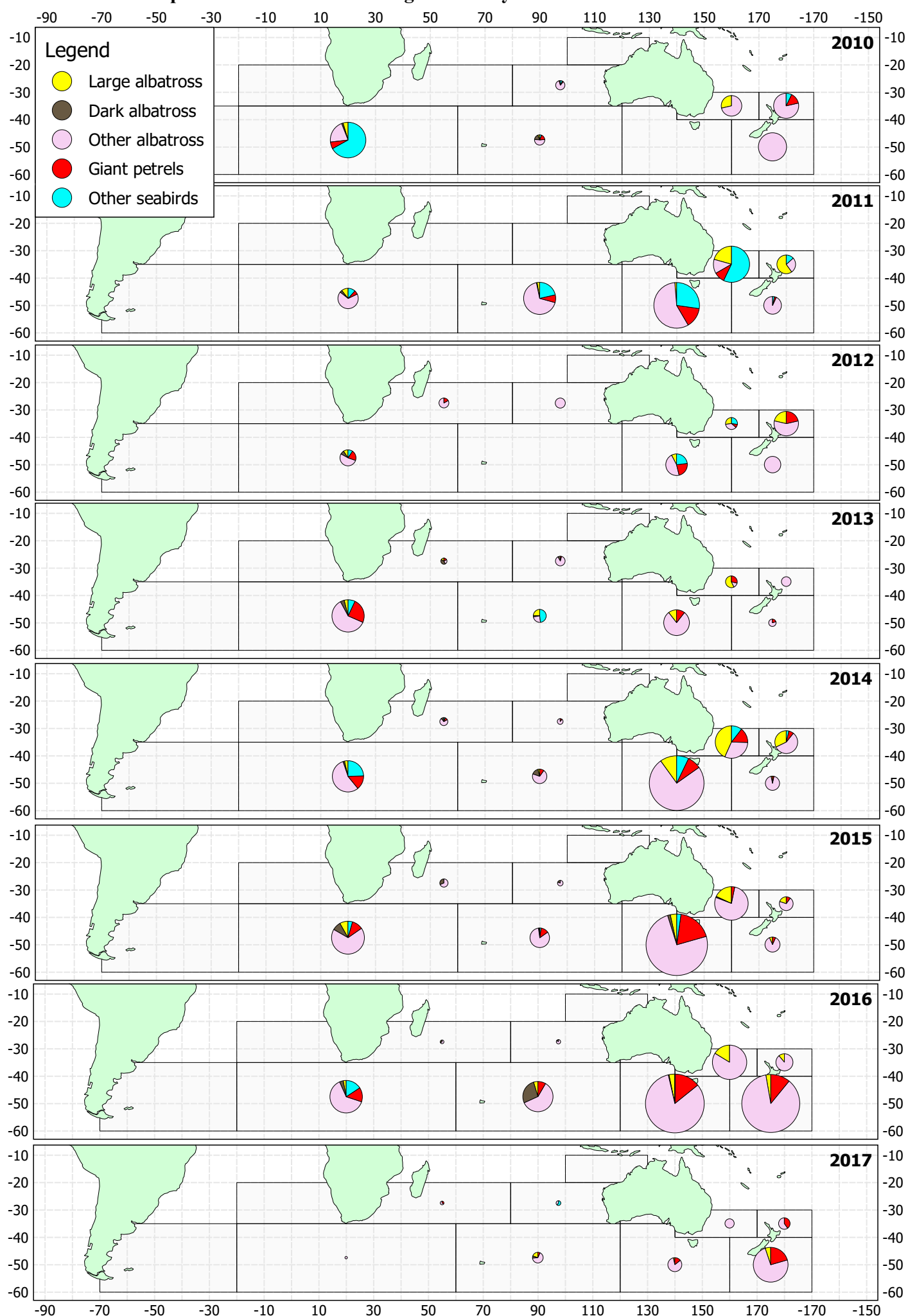
Observed bird mortality rates for the SBT longline fishery

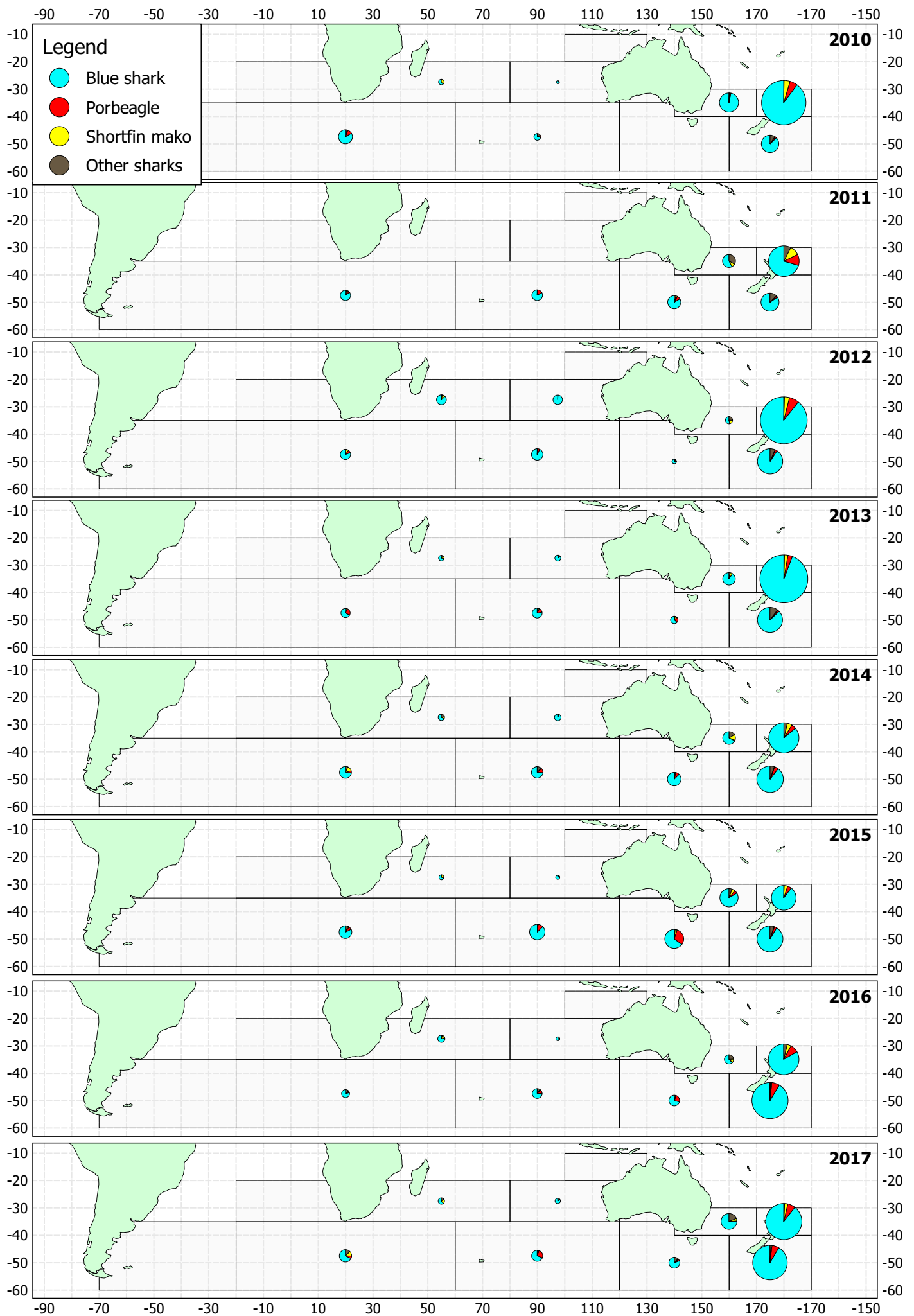# Observed shark mortality rates for the SBT longline fishery

Observed bird capture rates for the SBT longline fishery

Legend
- Large albatross
- Dark albatross
- Other albatross
- Giant petrels
- Other seabirds

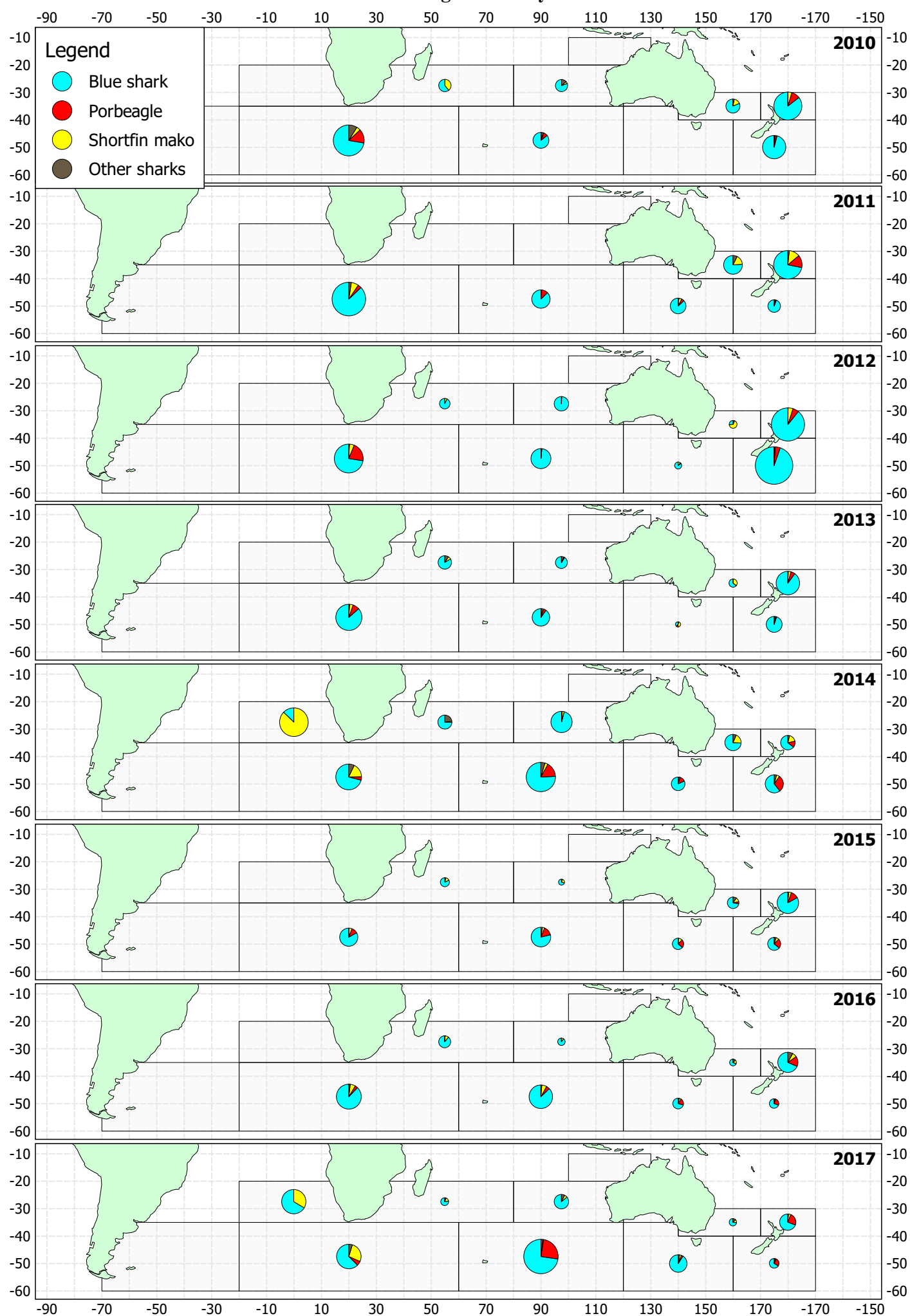2010
2011
2012
2013
2014
2015
2016
2017

Observed shark capture rates for the SBT longline fishery

Estimated total bird mortalities for the SBT longline fishery
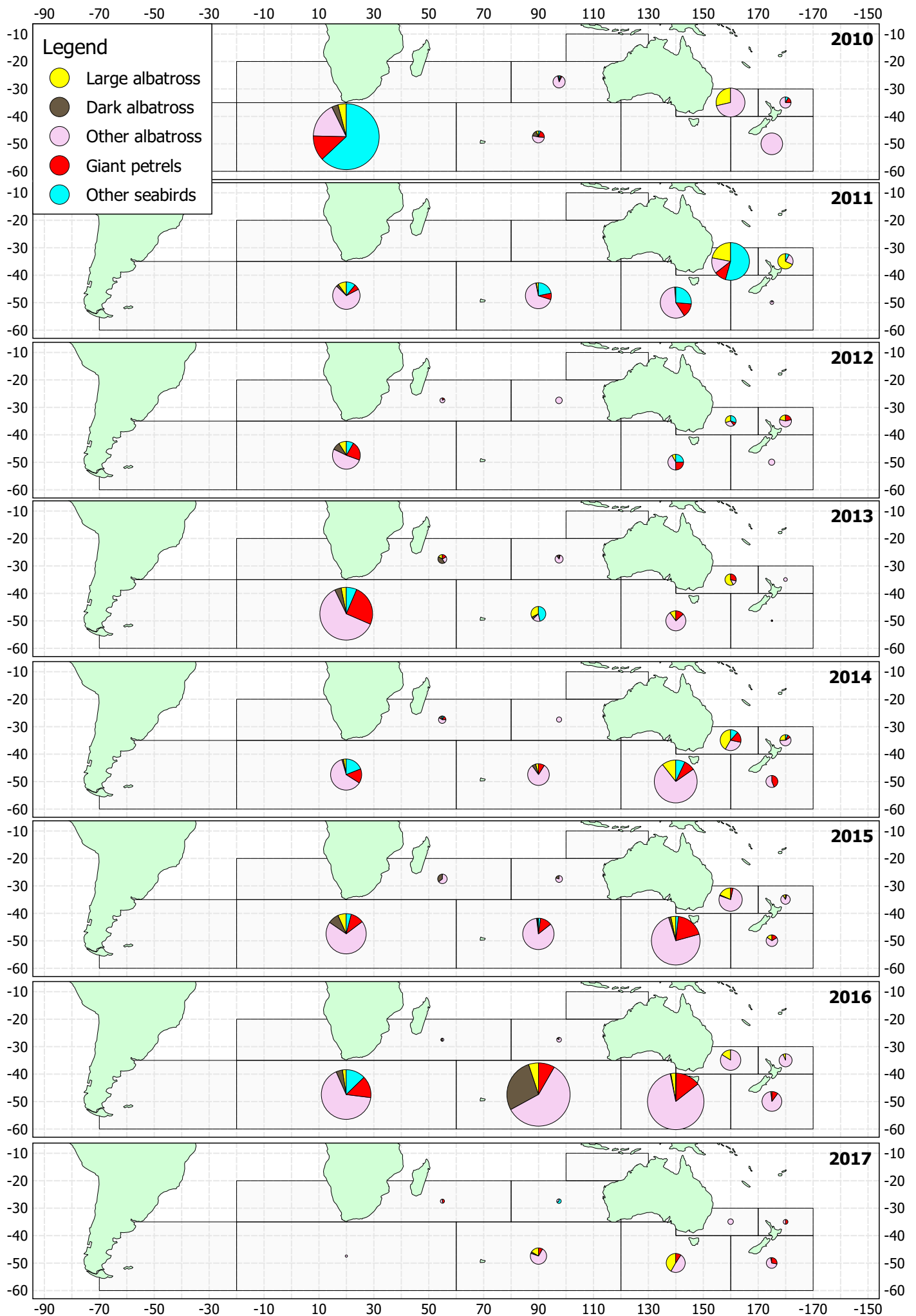
Estimated total shark mortalities for the SBT longline fishery

Legend
- Blue shark (cyan)
- Porbeagle (red)
- Shortfin mako (yellow)
- Other sharks (brown)

2010
2011
2012
2013
2014
2015
2016
2017

Observer coverage (observed hooks / total hooks expressed as a percent) by flag, gear, fleet, year and CCSBT statistical area. Representativeness is the proportion of statistical areas fished that reached the target of 10% observer coverage as per the SMMTG Recommendations.

Member code	Gear code	Fleet code	Year	1	2	3	4	5	6	7	8	9	14	15	Total	Representativeness
AU	LL	AUD	2010				18%								18%	100%
			2011				24%								24%	100%
			2012		8%		37%								33%	50%
			2013		0%		23%								22%	50%
			2014		0%		6%								6%	0%
			2015		22%		8%								8%	50%
			2016		0%		13%			9%					12%	33%
			2017			0%	11%			14%					11%	67%
	PS	AUD	2010			26%									26%	100%
			2011			17%				0%					16%	50%
			2012			14%				9%					11%	50%
			2013			0%				13%					12%	50%
			2014							23%					23%	100%
			2015							9%					9%	0%
			2016							19%					19%	100%
			2017							18%					18%	100%
JP	LL	JPD	2010				1%	0%		0%	9%	7%			5%	0%
			2011				4%	5%		7%	21%	14%			11%	40%
			2012				8%	1%		4%	11%	9%			8%	20%
			2013				5%	3%		7%	7%	11%			8%	20%
			2014				13%	26%		15%	5%	17%			12%	80%
			2015				15%	20%		16%	9%	21%			14%	80%
			2016				19%	8%		24%	2%	29%			17%	60%
			2017				6%	0%		11%	4%	0%			5%	20%
KR	LL	KRD	2010		0%						0%	25%			11%	33%
			2011		0%						0%	0%			0%	0%
			2012		0%						0%	16%			8%	33%
			2013		100%						21%	27%			24%	100%
			2014		1%						18%	0%			7%	33%
			2015		0%						12%	17%			15%	67%
			2016								0%	21%			19%	50%
			2017									18%			18%	100%
NZ	LL	NZC	2010						81%						81%	100%
			2011						74%						74%	100%
			2012					67%	84%						84%	100%
			2013					88%	78%						78%	100%
			2014						83%						83%	100%
			2015						81%						81%	100%
		NZD	2010					9%	8%						9%	0%
			2011					10%	0%						8%	0%
			2012					9%	7%						8%	0%
			2013					7%							7%	0%
			2014					11%	9%						10%	50%
			2015					9%	4%						7%	0%
			2016					16%	24%						19%	100%
			2017					18%	23%						20%	100%
TW	LL	TWD	2010		16%						12%	2%	3%		9%	50%
			2011										3%		3%	0%
			2012		32%							20%	41%		28%	100%
			2013		26%						9%	7%	14%		13%	50%
			2014		16%						25%	1%	19%		14%	75%
			2015		10%						9%	5%	15%		10%	50%
			2016		25%						15%	10%	19%		17%	75%
			2017		13%						12%	0%	11%		10%	75%
ZA	LL	ZAC	2012									88%	43%		68%	100%
			2013									100%	84%		85%	100%
			2014										94%		94%	100%
			2015									100%	97%		97%	100%
			2016									40%	63%		62%	100%
			2017									100%	100%		100%	100%
		ZAD	2012									0%	0%	0%	0%	0%
			2013									0%	0%	0%	0%	0%
			2014									16%	0%	3%	7%	33%
			2015									0%	0%	0%	0%	0%
			2016									2%	0%	0%	1%	0%
			2017									7%	0%	3%	5%	0%