SCIENTIFIC COMMITTEE
TENTH REGULAR SESSION

Majuro, Republic of the Marshall Islands
6-14 August 2014

SC10 Agenda 3.1.2 Species composition of purse-seine catches
Response to Para 90a) of SC9 Summary Report

WCPFC-SC10-2014/ ST-WP-02 (Supplementary information) Rev.1

SC9 recommended that:
a) the scientific services provider continue with analyses and simulations related to the consultancy reports on species composition in the purse-seine fishery. SC9 requested that the scientific services provider provide to SC10 annual estimates of the purse-seine catch based on: i) logbook reported species composition, ii) observer grab samples (previous approach), and iii) observer grab samples corrected for selectivity bias from spill sampling. Catch series from any variants on these should also be included. This will allow SC to follow changes in purse-seine catch estimates from historical methods. The work should also include any guidance on the implications of future estimates if only grab sampling occurs, (e.g. Can the selectivity bias correction be used into the future?).

In response to Para 90a) of the SC9 Summary Report, the SPC-OFP provided the following information with the attached Excel file.

The attached Excel file contains four series of annual catch estimates for those purse-seine fleets for which the species compositions are adjusted; that is, they do not include the domestic fleets of Indonesia and the Philipines, Japan 1x1 data since 1996, nor the EPO fleets. The total annual catches per fleet are determined from the annual catch estimates provided to SPC. The term "Logsheets", used below, also refers to the Japan 1x1 data prior to 1996; Japanese logsheet data are not used.

The four series are as follows:

(1) Unadjusted logsheets.
(2) Logsheets adjusted with a GLM of the proportion of BET in YFT+BET fit to uncorrected grab samples; see SC3–ST–IP–5. Note that the estimates for SKJ are the same as (1).
(3) Species compositions determined from GLMs fit to corrected grab samples; see SC9–ST–WP–3. The grab samples have been corrected for the selectivity bias. Skipjack are usually over-reported on logsheets; hence, the catch estimates for (3) show less skipjack than (1) and (2).
(4) Species compositions determined from GLMs fit to corrected grab samples, with pooling; see SC9–ST–WP–2. For strata of year, quarter, 5x5 and school association for which observer coverage is greater than or equal to 20%, the species compositions are determined by pooling the corrected grab samples within each stratum (instead of using the GLMs). The proportions

of the total catch for which pooling was used are shown in the table below: 98% in 2010 and 2011, 93% in 2012 and 64% in 2013. The resulting catch estimates are close to those in (3).

Record#	YY	TOT_C	TOT_OKAY	COV_CATCH
27	1993.00	723391.05	0.00	0.00
28	1994.00	820211.97	152.79	0.00
29	1995.00	757897.53	823.01	0.00
30	1996.00	561880.61	1070.65	0.00
31	1997.00	591511.07	5958.71	0.01
32	1998.00	817595.34	21938.52	0.03
33	1999.00	695239.96	12635.69	0.02
34	2000.00	720177.54	32123.41	0.04
35	2001.00	737828.35	38363.08	0.05
36	2002.00	873385.57	101963.45	0.12
37	2003.00	826561.60	86108.84	0.10
38	2004.00	893328.53	132807.69	0.15
39	2005.00	1000998.07	149996.86	0.15
40	2006.00	1020377.28	200726.88	0.20
41	2007.00	1124912.70	287117.63	0.26
42	2008.00	1132679.65	228646.72	0.20
43	2009.00	1281797.54	373287.20	0.29
44	2010.00	1233109.58	1208202.68	0.98
45	2011.00	1161740.80	1138828.25	0.98
46	2012.00	1366083.57	1267262.39	0.93
47	2013.00	1317827.72	847412.34	0.64

The service provider reports in SC10–ST–WP–2 that the research carried out under Project 60 shows that for the purse-seine fleets in the region, estimates of the species and size composition should be based on spill samples collected by observers. Doing so will result in estimates that can be given much greater confidence than by continuing to collect grab samples and subsequently correcting them for selectivity bias.

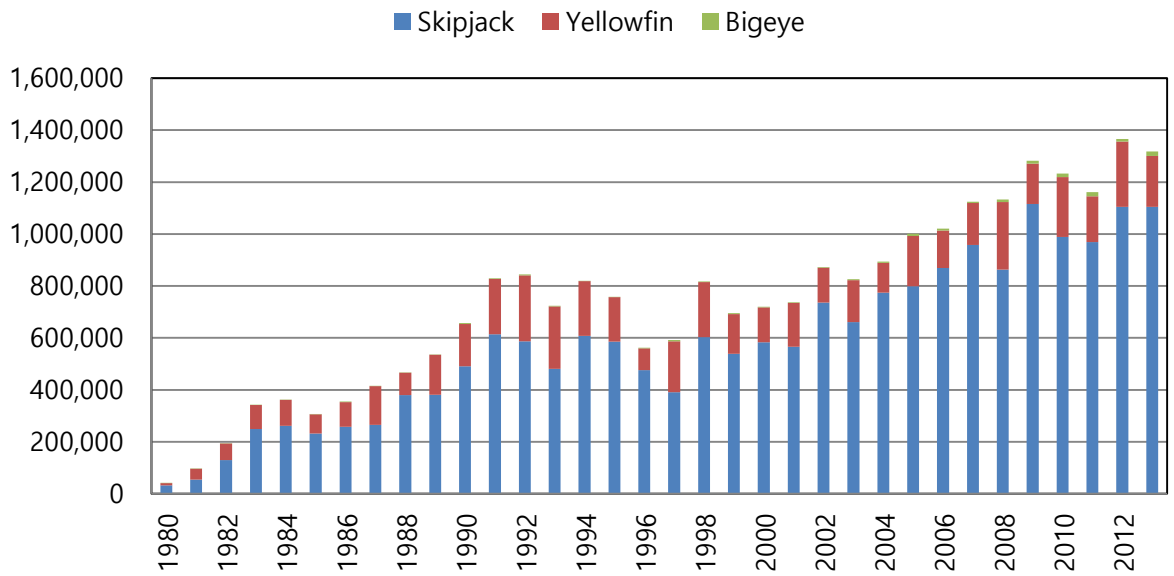
Project 60 has also shown that when crews are cooperative, the logistics of collecting spill samples are, in general, no more disruptive of the fishing operations than grab samples, given that grab samples are collected from each and every brail during a set, while spill samples are collected from a small number of brails. Regarding the potential transition from grab samples to spill samples, the following should also be noted:

- Observers that have been certified under the Pacific Island Regional Fisheries Observer (PIRFO) standards are easily trained to collect spill samples.
- The current observer data collection forms maintained by the SPC / FFA Tuna Fishery Data Collection Committee (DCC), which satisfy the WCPFC Regional Observer Programme (ROP) standards and which are used by most sub-regional and national observer programmes, already allow for the recording of spill samples.
- The only additional sampling material that is required is the spill sample bin; see SC10–ST–IP–02 for the details of the spill sample protocol, including the dimensions of the standardised bin.

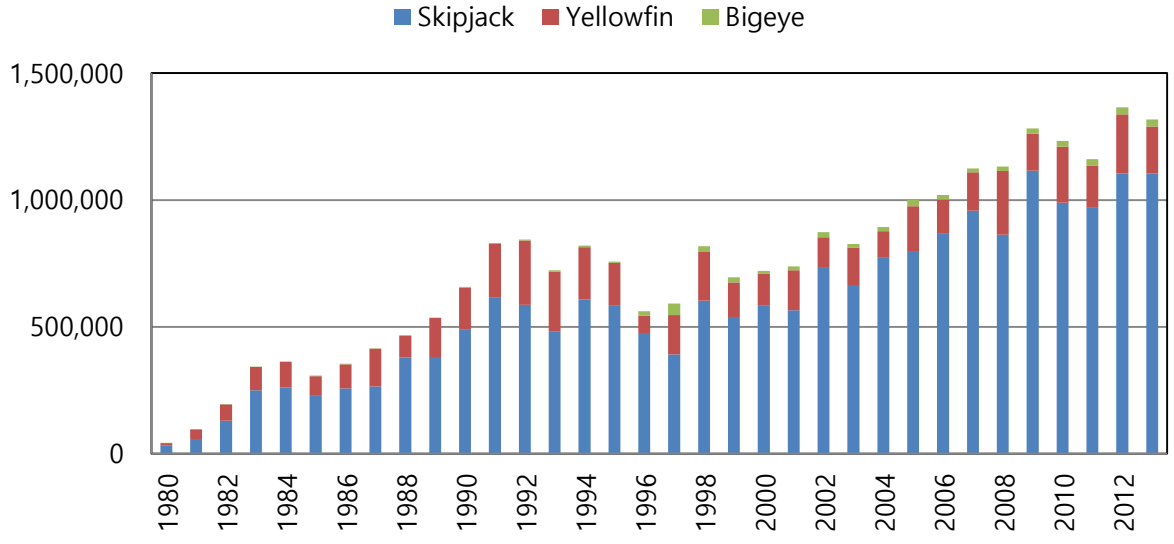
yy	skj_un	yft_un	bet_un	yft_yb	bet_yb	skj_h2	yft_h2	bet_h2	skj_h3	yft_h3	bet_h3		Check #1	Check #2	Check #3	Check #4
1967	34	33	0	33	0	41	25	1	41	25	1		67	67	67	67
1968	140	218	0	218	0	188	159	10	188	159	10		358	358	358	358
1969	77	3	0	3	0	60	16	4	60	16	4		80	80	80	80
1970	333	123	0	123	0	309	128	19	309	128	19		456	456	456	456
1971	667	192	35	192	35	590	262	41	590	262	41		894	894	894	894
1972	539	188	47	188	47	499	238	37	499	238	37		774	774	774	774
1973	1,602	504	166	504	166	1,566	650	56	1,566	650	56		2,272	2,272	2,272	2,272
1974	2,437	743	194	743	194	2,257	926	190	2,257	926	190		3,373	3,373	3,373	3,373
1975	4,583	1,664	141	1,664	141	4,338	1,666	384	4,338	1,666	384		6,388	6,388	6,388	6,388
1976	10,353	3,305	241	3,305	241	9,530	3,599	770	9,530	3,599	770		13,899	13,899	13,899	13,899
1977	13,434	4,956	153	4,956	153	12,390	5,341	812	12,390	5,341	812		18,543	18,543	18,543	18,543
1978	23,249	7,654	307	7,654	307	20,835	8,739	1,637	20,835	8,739	1,637		31,210	31,210	31,210	31,210
1979	24,875	10,671	259	10,671	259	23,452	10,735	1,618	23,452	10,735	1,618		35,805	35,805	35,805	35,805
1980	31,794	9,696	390	9,696	390	28,846	11,015	2,019	28,846	11,015	2,019		41,880	41,880	41,880	41,880
1981	55,069	40,856	1,005	40,856	1,005	59,290	30,408	7,232	59,290	30,408	7,232		96,930	96,930	96,930	96,930
1982	129,893	64,209	1,047	64,209	1,047	125,925	56,763	12,461	125,925	56,763	12,461		195,149	195,149	195,149	195,149
1983	249,476	92,194	1,416	92,194	1,416	230,981	93,841	18,263	230,981	93,841	18,263		343,086	343,086	343,086	343,086
1984	261,471	100,421	649	100,421	649	248,629	93,673	20,239	248,629	93,673	20,239		362,541	362,541	362,541	362,541
1985	231,503	74,063	2,000	74,063	2,000	211,798	80,240	15,528	211,798	80,240	15,528		307,566	307,566	307,566	307,566
1986	257,895	94,701	2,491	94,701	2,491	246,344	86,524	22,220	246,344	86,524	22,220		355,088	355,088	355,088	355,088
1987	264,867	149,165	1,625	149,165	1,625	258,564	129,779	27,313	258,564	129,779	27,313		415,656	415,656	415,656	415,656
1988	379,579	86,251	485	86,251	485	340,951	98,838	26,527	340,951	98,838	26,527		466,315	466,315	466,315	466,315
1989	380,960	154,022	1,535	154,022	1,535	357,876	151,034	27,606	357,876	151,034	27,606		536,517	536,517	536,517	536,517
1990	490,797	162,631	3,943	162,631	3,943	443,525	181,755	32,091	443,525	181,755	32,091		657,371	657,371	657,371	657,371
1991	614,655	212,665	2,748	212,665	2,748	586,829	209,753	33,486	586,829	209,753	33,486		830,068	830,068	830,068	830,068
1992	586,583	254,514	3,955	254,514	3,955	558,334	245,010	41,707	558,334	245,010	41,707		845,052	845,052	845,052	845,052
1993	481,135	240,117	2,139	235,705	6,551	482,743	208,387	32,261	482,743	208,387	32,261		723,391	723,391	723,391	723,391
1994	608,478	210,052	1,681	205,040	6,694	577,501	210,136	32,575	577,478	210,165	32,570		820,212	820,212	820,212	820,212
1995	585,848	171,126	924	166,097	5,953	549,444	180,020	28,433	549,211	180,244	28,443		757,898	757,898	757,898	757,898
1996	475,901	83,490	2,489	68,158	17,822	388,516	136,234	37,131	388,428	136,344	37,108		561,881	561,881	561,881	561,881
1997	391,079	195,935	4,497	154,938	45,494	313,582	216,422	61,507	313,036	216,021	62,453		591,511	591,511	591,511	591,511
1998	603,239	212,191	2,165	192,173	22,183	430,949	324,439	62,208	430,522	325,272	61,801		817,595	817,595	817,595	817,595
1999	539,007	152,942	3,291	136,587	19,646	395,043	243,049	57,148	396,629	241,832	56,779		695,240	695,240	695,240	695,240
2000	583,790	134,261	2,127	126,538	9,849	442,397	246,603	31,177	442,519	245,771	31,888		720,178	720,178	720,178	720,178
2001	565,826	169,141	2,861	157,233	14,770	463,582	234,251	39,995	464,041	234,339	39,448		737,828	737,828	737,828	737,828
2002	736,014	134,605	2,766	117,802	19,569	611,084	210,987	51,314	612,015	209,829	51,541		873,386	873,386	873,386	873,386
2003	661,227	161,557	3,778	151,852	13,483	552,523	243,002	31,036	554,652	241,503	30,406		826,562	826,562	826,562	826,562
2004	774,558	113,920	4,850	102,644	16,127	591,127	243,352	58,850	594,125	240,903	58,301		893,329	893,329	893,329	893,329
2005	798,933	193,532	8,534	176,611	25,454	675,326	281,002	44,670	677,520	279,454	44,023		1,000,998	1,000,998	1,000,998	1,000,998
2006	869,130	144,747	6,500	133,556	17,691	764,963	211,432	43,982	766,775	210,026	43,576		1,020,377	1,020,377	1,020,377	1,020,377

2007	957,371	161,703	5,839	152,343	15,199	861,816	229,204	33,893	854,786	236,323	33,804		1,124,913	1,124,913	1,124,913	1,124,913
2008	862,795	260,461	9,424	251,143	18,743	785,569	312,484	34,627	781,357	317,031	34,292		1,132,680	1,132,680	1,132,680	1,132,680
2009	1,115,766	155,705	10,326	145,918	20,113	1,005,827	232,834	43,137	1,002,518	236,957	42,323		1,281,798	1,281,798	1,281,798	1,281,798
2010	989,348	230,345	13,417	220,646	23,116	917,678	276,206	39,226	921,589	270,468	41,052		1,233,110	1,233,110	1,233,110	1,233,110
2011	969,280	175,461	17,000	165,489	26,972	855,532	253,858	52,351	871,007	235,398	55,335		1,161,741	1,161,741	1,161,741	1,161,741
2012	1,104,335	251,764	9,985	233,727	28,022	1,004,427	314,127	47,530	1,034,983	286,883	44,217		1,366,084	1,366,084	1,366,084	1,366,084
2013	1,104,401	195,969	17,457	185,236	28,191	989,825	271,073	56,930	996,374	266,630	54,823		1,317,828	1,317,828	1,317,828	1,317,828
													25,225,876	25,225,876	25,225,876	25,225,876

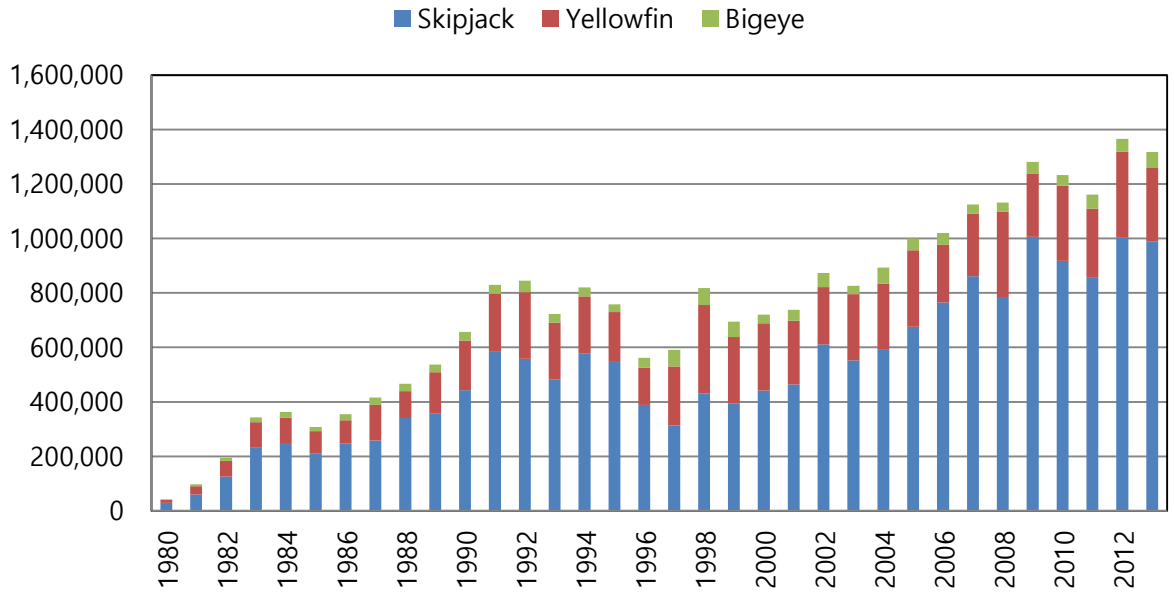
Unadjusted Logsheets



Logsheets Adjusted With Grab Samples For YFT + BET



GLMs Fit To Corrected Grab Samples



GLMs Fit To Corrected Grab Samples, With Pooling