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Report on Project 60: Collection and Evaluation of Purse-Seine Species Composition Data

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Progress Report for the WCPFC Consultancy on the Collection and Evaluation of Purse-Seine Species Composition Data, April 2011 — July 2011

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Noumea, New Caledonia

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Introduction

A consultancy agreement was established between the Western and Central Pacific Fisheries Commission and the Secretariat of the Pacific Community in April 2009 for a project on the collection and evaluation of purse-seine species composition data. The objective of the project is to improve the collection and representative nature of species composition data caught by purse-seine fisheries in the WCPO in order to improve the stock assessments of key target species in the WCPO. The initial duration of the project was from 1 April 2009 to 31 January 2010. The project was extended to the period from 1 April 2010 to 31 January 2011 and again to the period from 1 April 2011 to 31 January 2012. This report is intended to satisfy the requirement under the Terms of Reference that a project progress report for the second period shall be submitted to the Commission by 22 July 2011.

Scope

The scope of work under the project includes the following:

a. Identify key sources of sampling bias in the manner in which species composition data are currently collected from WCPO purse seine fisheries and investigate how such biases can be reduced

b. Review a broad range of sampling schemes at sea as well as onshore, and develop appropriate sampling designs to obtain unbiased species composition data by evaluating the selected sampling procedures

c. Review current stock assessment input data in relation to purse-seine species composition and investigate any other areas to be improved in species composition data, including collaborations with other RFMOs.

Activities

During the period from 1 April 2010 to 31 January 2011, the following activities were undertaken:

Scope (a)

- During the April 2009 – January 2010 period, a study entitled "Selectivity bias in grab samples and other factors affecting the analysis of species composition data collected by observers on purse seiners in the Western and Central Pacific Ocean" was completed. Size selectivity bias in grab samples taken by observers was estimated using data collected from paired grab and spill

samples during four trips on purse seiners fishing anchored FADs in Papua New Guinea during 2008.

During the April 2010 – January 2011 period, the study was extended with data from a total of 17 purse-seine trips during which paired grab and spill sampling took place (Table 1, Figure 1). The study was presented at the Sixth Regular Session of the WCPFC Scientific Committee, 10–19 August 2010, Nuku'alofa, Tonga, in a working paper entitled "Update on the estimation of selectivity bias based on paired spill and grab samples collected by observers on purse seiners in the Western and Central Pacific Ocean."

During the current reporting period, estimates of selectivity bias were used to correct purse-seine length frequencies. The study was submitted to the Seventh Regular Session of the WCPFC Scientific Committee, 9–17 August 2011, Pohnpei, Federated States of Micronesia, in an information paper entitled "Purse-Seine Length Frequencies Corrected for Selectivity Bias in Grab Samples Collected by Observers."

Scope (b)

- Table 1 and Figure 1 summarise the trips during which paired sampling was undertaken prior to SC6 (August 2010).

  From August 2010 until March 2011, observers were contracted to do paired grab and spill samples during (i) two trips onboard the Korean vessel, *Jang Bo*; (ii) two trips onboard the Chinese Taipei vessel, *Fairwell 707*; and (iii) two trips onboard the American vessel, *Cape Ferrat*. Five of the six trips were unsuccessful. The two trips onboard the *Jang Bo* were unsuccessful because the captain and crew would not allow the spill sampler to follow the correct sampling protocol. The first trip onboard the *Fairwell 707* was unsuccessful because the grab sampler, a Chinese Taipei national, was not acceptable to the PNA and therefore disembarked prior to fishing. An acceptable grab sampler embarked in Pago Pago for the second trip. The two trips onboard the *Cape Ferrat* were unsuccessful because the bin used for spill sampling was placed on the wet deck in the space under the chute in such a manner that large fish were excluded from sampling.

  Paired sampling onboard a Japanese purse seiner were under discussion when the tsunami hit Japan in March 2011; following the disaster, the trips were postponed.

- Trials of the motion-compensated scale purchased previously were further delayed due to lack of manpower resources to organise the trials in Papua New Guinea.

Scope (c)

- MULTIFAN-CL purse-seine input data, which are used by the OFP to conduct stock assessments, were adjusted with observer data, 1996–2010, corrected for size selectivity bias (Figures 2 and 3). A model-based approach to estimating the species composition of catches for strata of year, quarter, MFCL area and school association for which species composition data are missing was applied. Length-frequency data were also adjusted (Figures 4–6). The results of the stock assessment using the adjusted data will be presented at SC7.

- No further collaboration with other RMFOs in regard to purse-seine species composition took place during the current reporting period.

Conclusion and Future Work

Regarding scope (a), the SC7 working paper — "Purse-Seine Length Frequencies Corrected for Selectivity Bias in Grab Samples Collected by Observers" — developed a method to adjust length frequencies with grab samples corrected for selectivity bias. However, there is still a lack of large fish in the paired samples, which are required to estimate the selectivity bias over the whole size range of fish caught by purse seiners. The continuation of paired sampling is therefore required, preferably on vessels fishing unassociated schools, which tend to contain larger fish.

Regarding scope (b), the results from the six paired sampling trips undertaken following SC6 are disappointing, with five of the trips unsuccessful. While the lack of cooperation of the crews was largely responsible for the spill sampler not being able to follow the sampling protocol on the *Jang Bo* and *Cape Ferrat*, part of the responsibility also lay with the spill sampler himself, who was unable to communicate effectively with the crew. In the future, the communication skills of spill samplers contracted for this project will be given more careful consideration. This situation will improve with the recent recruitment by the OFP of a *Data Collection Officer* for a two-year period. The funding for this position has been provided by the New Zealand Aid Programme and covers salary and travel expenses of the Data Collection Officer. (All other expenses for this project — including salaries for the other observers and their travel expenses, the construction of spill sampling bins and all other operational costs — will continue to be funded by the Commission under Project 60.) Prior to accepting the position, the successful applicant, Mr Ferral Lasi, was a senior officer in the Ministry of Fisheries and Marine Resources of the Solomon Islands. His initial role will be to undertake spill sampling during paired sampling trips, following which he will be responsible for organising paired sampling trips, and the briefing and debriefing of the spill samplers. He will undertake his first paired sampling trip in September 2011. He will also be responsible for testing the motion-compensated scales and recommencing port sampling in Noro, Solomon Islands.

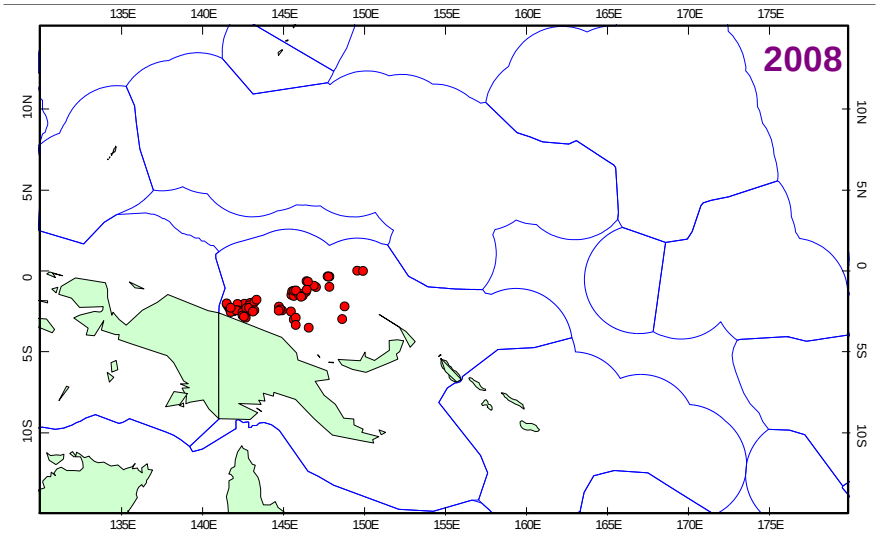
Regarding scope (c), both the catch data and length frequencies used in the tuna stock assessments were adjusted with grab samples that had been corrected with estimates of selectivity bias and the results of the stock assessment using the adjusted data will be presented at SC7. Areas for improvement in species composition data may be discussed with other RFMOs at a meeting of the steering committee of a purse-seine bycatch project of the International Seafood Sustainability Foundation (ISSF) scheduled for 21–23 August 2011 in San Diego.

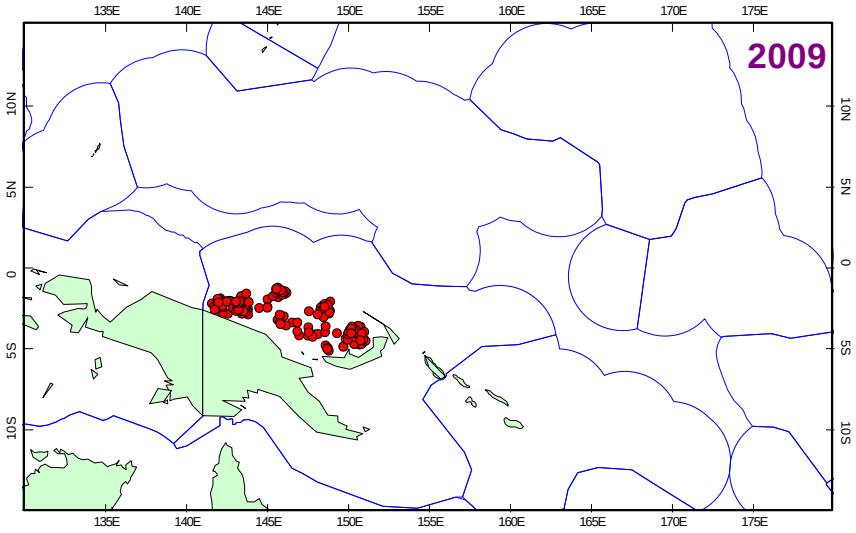
In summary, paired sampling trips have not been carried out since the second trip of the *Cape Ferrat* ended in March 2011, in part because the planned trips onboard a Japanese vessel were postponed following the tsunami and in part to await the recruitment of the Data Collection Officer. Thus, sufficient funds remain from the April 2011 – January 2012 budget for this project to continue beyond the scheduled termination date of 31 January 2012. *The Scientific Committee may therefore wish to recommend that the project be continued beyond January 2012, but with no additional funding from the Commission.* The financial status of the project should be reviewed at the Eighth Meeting of the Scientific Committee in August 2012.

Table 1. Date, location, catch and number of sets sampled for trips during which paired grab and spill samples were collected

Trip #	Date		Latitude		Longitude		Catch (Tonnes)			Number of Sets Pair Sampled					
	Min	Max	Min	Max	Min	Max	Total	Pair Sampled	Not Pair Sampled	Total	Anchored FADs	Drifting FADs	Logs	Unassoc	Other
1	23-Mar-08	27-Mar-08	03S	01S	143E	146E	452	452	0	7	7	0	0	0	0
2	18-May-08	08-Aug-08	04S	00N	141E	150E	2,108	1,172	935	31	30	0	1	0	0
3	07-Jun-08	30-Jun-08	04S	00N	143E	149E	649	580	69	13	10	1	0	0	2
4	14-Jul-08	09-Aug-08	03S	02S	141E	146E	698	615	83	15	9	4	1	0	1
5	03-May-09	05-Jun-09	04S	02S	148E	151E	508	469	39	15	13	0	1	1	0
6	04-May-09	04-Jun-09	03S	01S	143E	146E	408	256	152	9	8	0	0	0	1
7	04-Jun-09	04-Aug-09	05S	02S	142E	151E	789	613	175	23	20	1	2	0	0
8	14-Jun-09	28-Jul-09	05S	01S	142E	148E	498	335	163	13	9	0	4	0	0
9	16-Jun-09	26-Jul-09	05S	02S	142E	150E	359	352	7	22	17	0	5	0	0
10	22-Aug-09	10-Sep-09	05S	04S	150E	151E	317	317	0	16	10	1	4	0	1
11	10-Sep-09	10-Oct-09	05S	02S	143E	150E	605	518	87	10	7	0	3	0	0
12	09-Oct-09	21-Oct-09	02S	02S	143E	144E	565	541	25	8	4	0	4	0	0
13	03-Nov-09	01-Dec-09	03S	01S	142E	146E	534	514	20	15	12	0	3	0	0
14	11-Nov-09	04-Dec-09	03S	02S	143E	146E	411	388	23	14	13	0	0	0	1
15	13-Nov-09	07-Dec-09	03S	02S	142E	143E	589	460	129	15	15	0	0	0	0
16	19-Mar-10	18-Apr-10	04S	01N	146E	165E	821	749	71	20	0	10	0	9	1
17	29-Apr-10	11-May-10	06S	01N	152E	156E	383	343	40	8	0	7	0	1	0
						Total	10,693	8,675	2,019	254	184	24	28	11	7

Figure 1. Location of sets from which paired spill and grab samples were collected




2009
135E
140E
145E
150E
155E
160E
165E
170E
175E
10N
5N
0
5S
10S

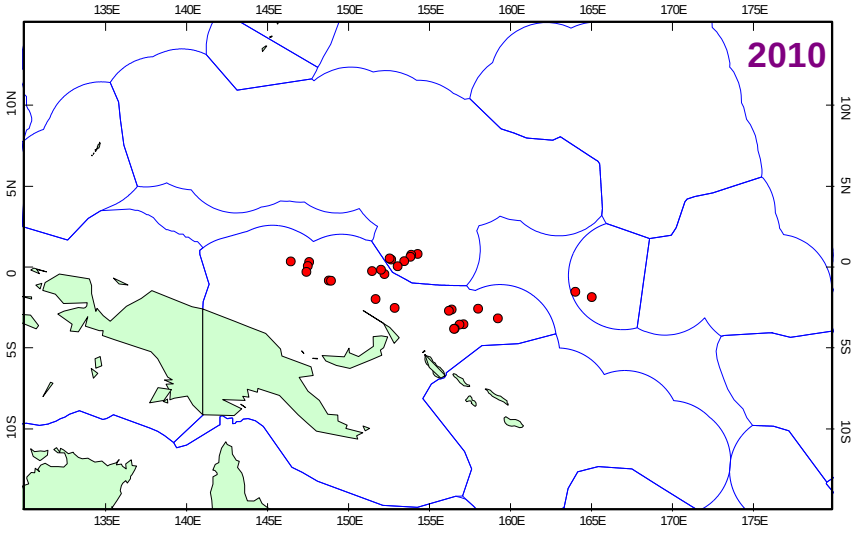

2010
135E
140E
145E
150E
155E
160E
165E
170E
175E
10N
5N
0
5S
10S

Figure 2. Estimates of size selectivity bias for a model with 5 cm length intervals, with small fish and large fish grouped

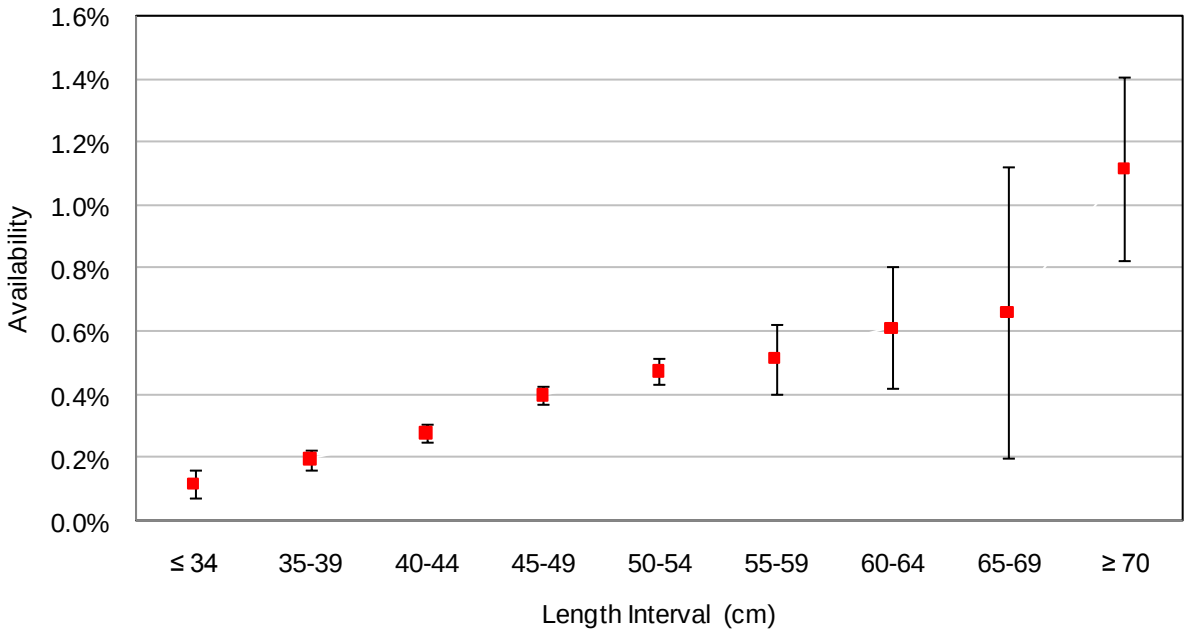


Figure 3. Species compositions for unadjusted and adjusted catch data used in MFCL analyses, 1972–2010, 20°S to 20°N and 130°E to 150°W

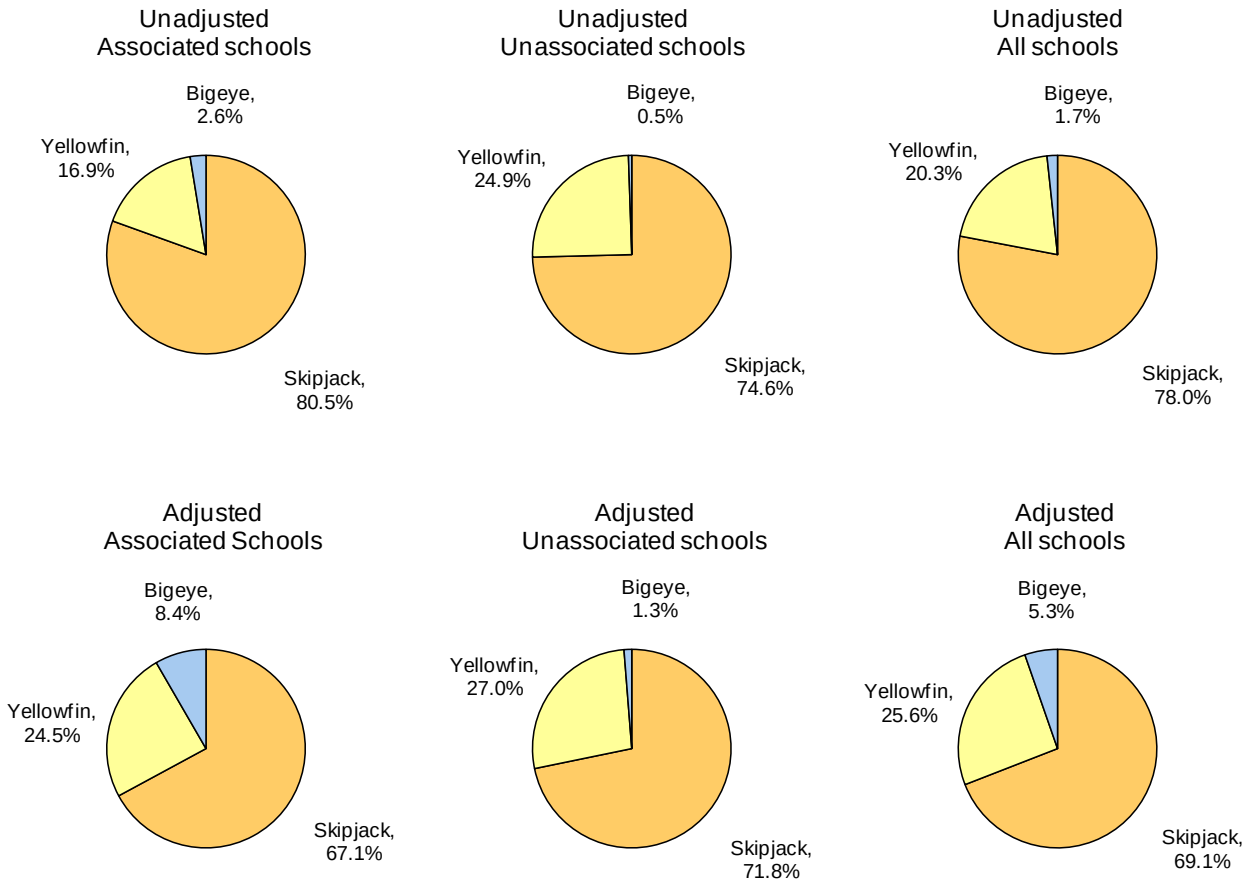


Figure 4. Uncorrected and corrected length frequencies for skipjack

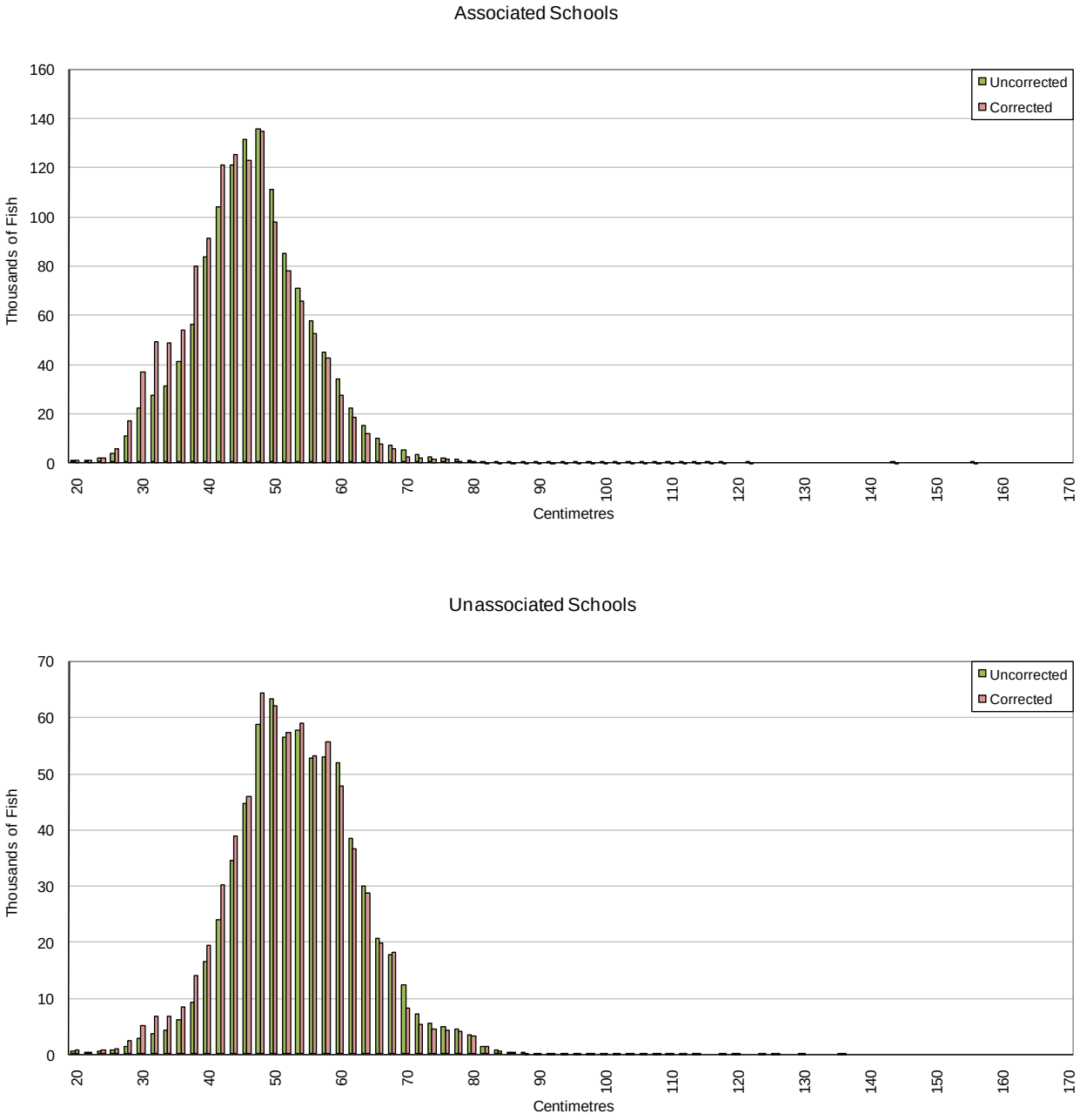


Figure 5. Uncorrected and corrected length frequencies for yellowfin

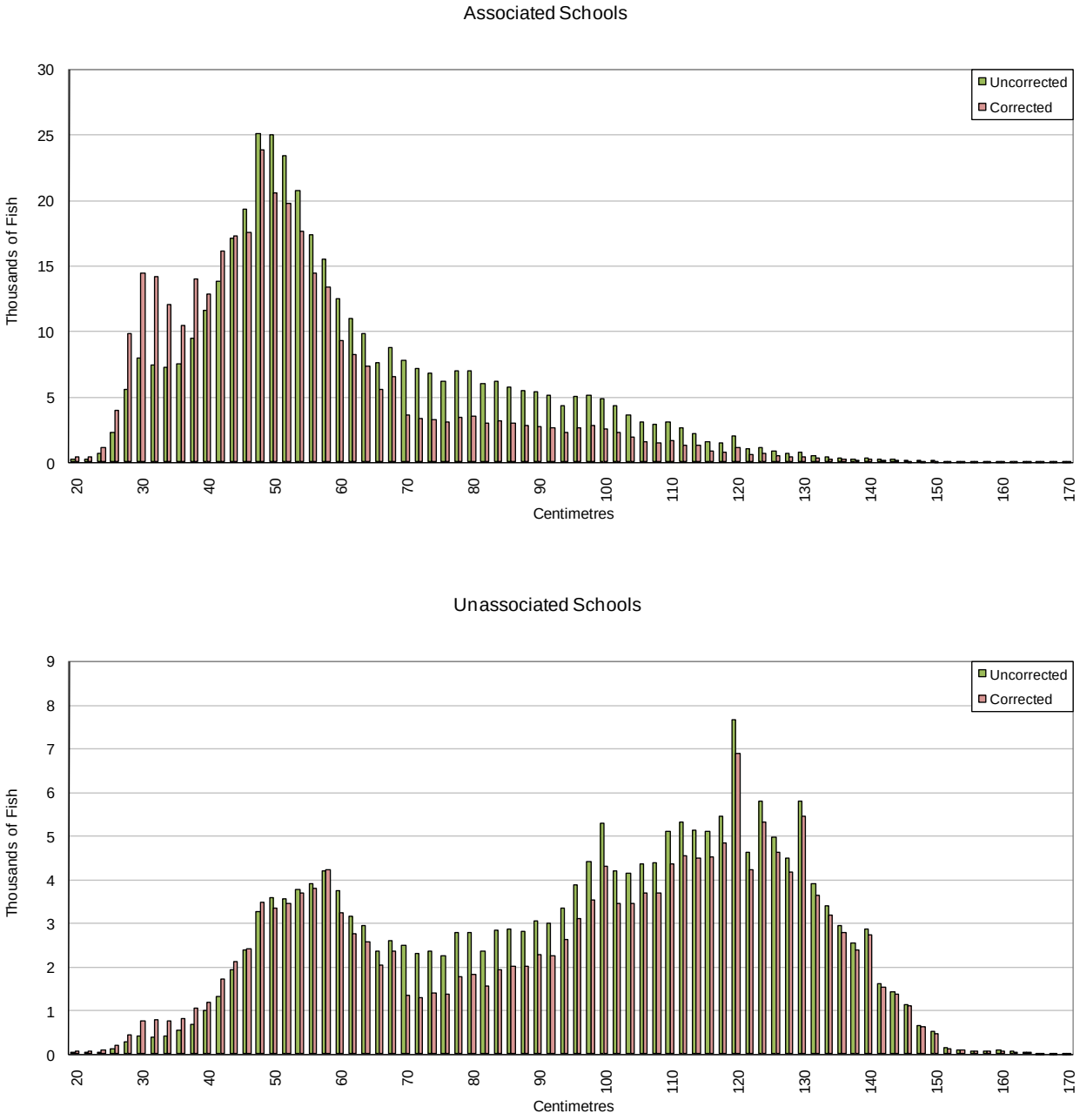


Figure 6. Uncorrected and corrected length frequencies for bigeye