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An update on cannery data with potential use to the WCPFC

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INTRODUCTION

Comprehensive cannery receipts data from more than twenty processors [receiving WCPFC purse seine catch] have been provided to the WCPFC over the past 5-6 years as part of an initiative of the International Seafood Sustainability Foundation (ISSF) and their participating processing companies. Lewis and Williams (2016) reviewed the potential use of cannery receipt data for the work of the Western and Central Pacific Fisheries Commission (WCPFC), and in particular, providing a means of validating the estimates of the purse seine catch by species using logsheet-reported catches adjusted with observer data estimates of species and size composition. The main findings of Lewis and Williams (2016) were that there is clearly potential for using cannery receipts data to validate/compare species and size composition breakdowns by fleet determined from observer-derived estimates, provided the following applies:

- The consolidated total trip catch according to cannery data is consistent with the total trip catch from logsheets and the observer data (that is, the data from canneries covering the entire trip are collected, compiled and available), and
- The cannery is recording species composition for all relevant size categories.

Unfortunately, Lewis and Williams (2016) found that only 5% of the available cannery data satisfies the following criteria, which would be necessary to validate observer data:

(i) Matching of trips for observer and cannery data, and
(ii) Species composition was undertaken by the processing company for all size categories, and
(iii) The difference between estimated catch from observer and cannery data is < 5%.

Williams (2017) outlined a methodology for increasing the coverage of cannery data that can be used to validate species composition determined from observer data (from 5% to around 20-25%).

This brief paper provides an update of recent developments in the management of cannery data and an update of the data summaries presented in Williams (2017).

This paper also provides a list of minimum required fields for cannery data (see ANNEX), which are currently provided by the ISSF participating processing companies, and can be used as the basis for any voluntary submissions of cannery data from other processing companies that are yet to provide data.

RECENT DEVELOPMENTS

Cannery data continue to be provided, now covering years 2017 and 2018 (with thanks to respective processing plants compiling and submitting the data). Over the past year, a new web-based system to enter cannery data has been developed and implemented by the Scientific Service Provider (SPC). The new system is a component of the integrated tuna fishery database application Tufman 2, which integrates a wide range of tuna fishery data (e.g. logbooks, observer, port sampling, landings and now cannery data). This incorporation of cannery data into this system now means that it is automatically linked to respective logbook and observer data at the trip level, which facilitates the comparison of total trip catch by species (noting that cannery data are only accessible to the Scientific Service Provider in this system).

An additional feature was added to this system over the past year: the submissions from most processing plants are received as MS EXCEL files and a tool has been developed to automatically load these data directly into the cannery database at SPC and thereby avoid the need to enter these data. A previous proposal had considered providing a (web-based) system to processing plants to enter their data directly into the regional cannery database, but this is no longer required with this new auto-loading tool.

These developments have made it much easier to make comparisons of cannery data with other types of data which will facilitate future analyses of these data.

DISCUSSION AND OBSERVATIONS

The following are observations on information presented in Figures 1–4:

1. In both Figures 1 and 2, the species composition of the WCPFC estimates and the observer data are relatively close, which is to be expected. The difference is due to the WCPFC estimates being raised estimates so it will depend on the relative coverage of the observer data by fleet and set type for that year.
2. Figure 1 shows that the original cannery data have species composition for skipjack and yellowfin tuna similar to the logsheet-reported species composition for years 2013–2015, although the bigeye tuna species composition is closer to the observer and WCPFC estimates. For years 2016–2017, the original cannery data diverge from the logsheet data (for skipjack and yellowfin tuna), but remain different to the species composition in the WCPFC estimates. The assumption on the similarity for skipjack and yellowfin tuna in the cannery and logsheet data (for 2013–2015) is (i) the lack of large tuna covered in the available cannery data and (ii) the lack of an adequate breakdown of small yellowfin tuna in the logsheet data. The reason as to why the species composition of the bigeye tuna from cannery data is better aligned to the WCPFC estimates and observer data is not evident at this stage. These findings need further investigation.
3. Figure 2 shows that the adjusted cannery data has a better alignment of species composition for all tuna species with the WCPFC estimates and observer data, particularly in more recent years 2015–2017, which could be explained as a result of ISSF conducting audits and advocating the standard species and size categories in company data submissions.
4. The major difference between the cannery and adjusted cannery data (i.e. between Figures 1 and 2) is the change in the species composition of skipjack tuna (downwards) and yellowfin tuna (upwards). The increase in the species composition for yellowfin tuna in the adjusted cannery data is due to the method applied (see Williams, 2017), whereby the cannery data were augmented by 'missing' large yellowfin tuna catch (and to a lesser extent large bigeye tuna catch) through the comparison of logsheet and cannery unloadings at the trip level. This increase in the proportion of large yellowfin (and bigeye) tuna in the adjusted cannery data means a compensation occurs in the other species/size classes, and this change has the most effect with the skipjack tuna species composition. The alignment of adjusted cannery data species composition with WCPFC estimates and observer data for years 2016 and 2017 is noteworthy.
5. In contrast to skipjack and yellowfin tuna, the bigeye tuna species composition for the cannery data (i.e. original cannery data versus adjusted cannery data) did not change significantly between Figures 1 and 2. This could be due to the lack of large bigeye tuna that is not covered in the available cannery data, which has been included in the adjusted cannery data version through logsheet-reported large bigeye tuna catch. This assumption will need to be investigated.
6. Figures 3 and 4 contrast the tuna species and size composition breakdowns for a selected fleet (US, since this fleet has the highest coverage of cannery data) and year (2016, since observer coverage for 2017 is relatively low at this stage), between (i) cannery/processor data and (ii) adjusted and raised observer estimates of species and size composition (see Lawson, 2013). Coverage of available US PS processor data for 2016 is very high, and there is mostly very close alignment in both species and size composition of the catch in these two sources of data. The main difference is in the category of large yellowfin/bigeye tuna (> 20lbs) which appears to be around 7,000 MT less in the cannery/processor data, although this could be due to some of the large yellowfin/bigeye catch from this fleet directed to a processor that is not covered in the ISSF submissions of data. Further investigation into this difference will be undertaken in order to further confirm the value of cannery/processor data as a means of independent validation of WCPFC estimates.

FUTURE WORK

This brief paper provides an update to show how cannery data can be used in the process of validating estimates of the species composition of the purse seine catch. This work is ongoing and a better understanding of the representativeness of the cannery data will only improve these insights to the point where, for example, this type of information could be included in the information presented under Project 60, with a goal to investigate better methods for comparing cannery and observer data (see Peatman et al., 2018).

The paper again notes that improved coverage of cannery data (i.e. submissions from all processor plants) will obviously improve the usefulness of these data; for this reason a list of minimum required fields for cannery data (see ANNEX) are provided for voluntary submissions of cannery data from other processing companies that are yet to provide data.

REFERENCES

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TABLES

Table 1. Typical Cannery Data Size Categories

Commercial categories	Equivalent categories in KGs	Equivalent used on PS logbooks for YFT and BET
< 3lbs	(< 1.4 kgs)	SMALL < 20 lbs (~9 kgs)
3.0 - 4.0 lbs	(1.4- 1.8 kgs)	
4.0 -7.5 lbs	(1.8 – 3.4 kgs)	
7.5 - 20 lbs	(3.4 – 9.1 kgs)	
20 lbs up	(9 or 10 kgs up)	LARGE > 20 lbs (~9 kgs)

Table 2. Coverage of matched logsheet/observer/cannery trip data for the WCPFC tropical purse seine fishery (excludes Indonesia, Philippines and Vietnam domestic fisheries).

YEAR	Total Tuna catch (MT)				
	WCPFC Estimates	Cannery data	%	Matched Log / Obs / Cannery	%
2013	1,549,404	625,575	40.4%	435,503	28.1%
2014	1,754,587	727,876	41.5%	430,352	24.5%
2015	1,561,318	573,876	36.8%	386,350	24.7%
2016	1,564,411	681,019	43.5%	393,404	25.1%
2017	1,452,074	604,858	41.7%	132,023	9.1%

FIGURES

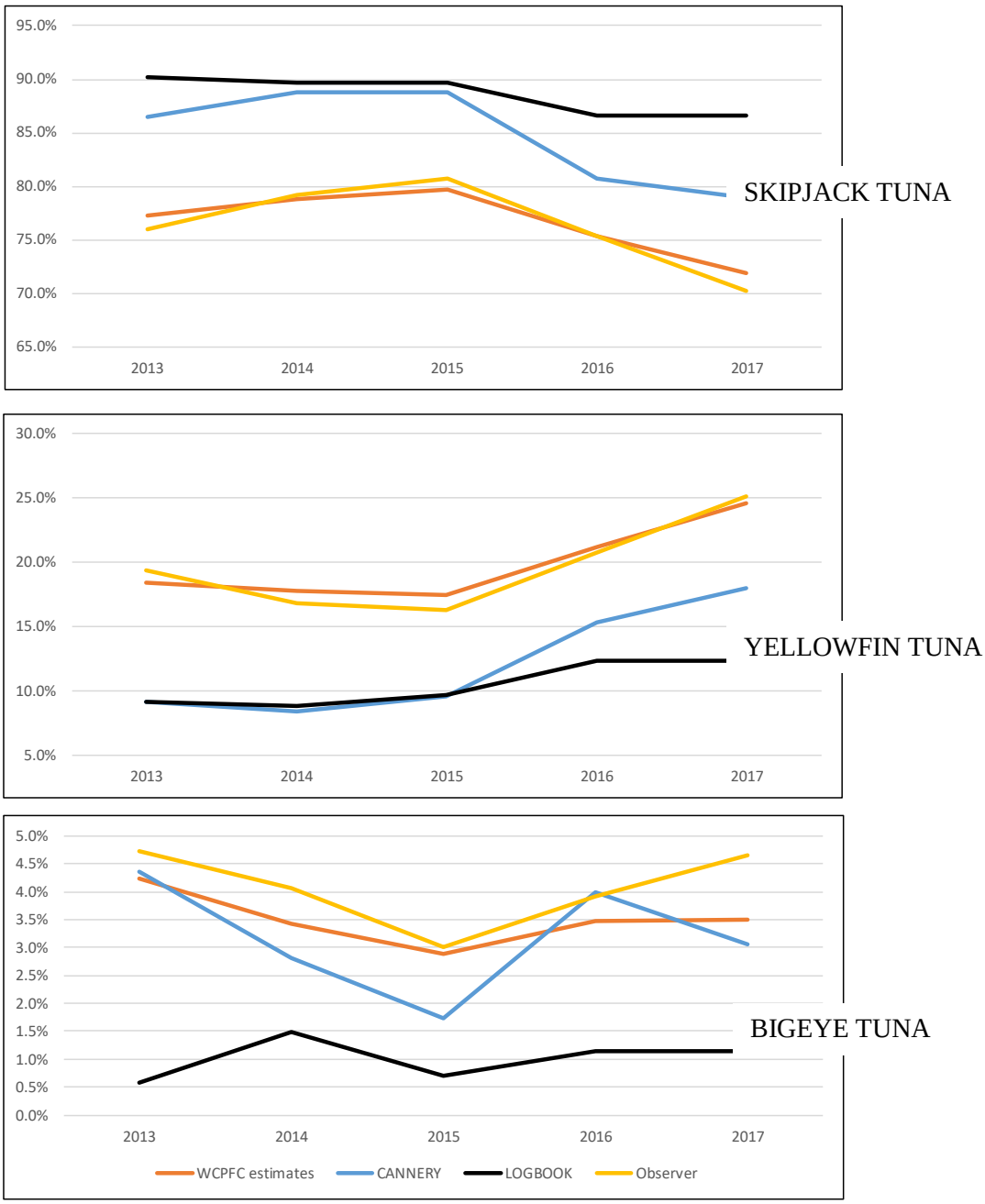

Figure 1. Purse seine tuna species composition by source of data, including unadjusted cannery data.

WCPFC Estimates: Estimates of WCPFC tropical purse seine fishery catch, excluding Indonesia, Philippines and Vietnam domestic fisheries. Catch is estimated according to Lawson 2007, Lawson 2010, Lawson 2013.
Logbook: Unadjusted logbook data for the WCPFC tropical purse seine fishery. Trips matched to observer and cannery data only.
Observer: Observer sample estimates, adjusted for size and species selectivity.
Cannery: Cannery data. Trips matched to logsheet and observer data only.

Figure 2. Purse seine tuna species composition by source of data, including <u>adjusted</u> cannery data.

WCPFC Estimates: Estimates of WCPFC tropical purse seine fishery catch, excluding Indonesia, Philippines and Vietnam domestic fisheries. Catch is estimated according to Lawson 2007, Lawson 2010, Lawson 2013.
Logbook: Unadjusted logbook data for the WCPFC tropical purse seine fishery. Trips matched to observer and cannery data only.
Observer: Observer sample estimates, adjusted for size and species selectivity.
Cannery (adjusted): Adjusted cannery data (see section METHODOLOGY in Williams, 2017). Trips matched to logsheet and observer data only.

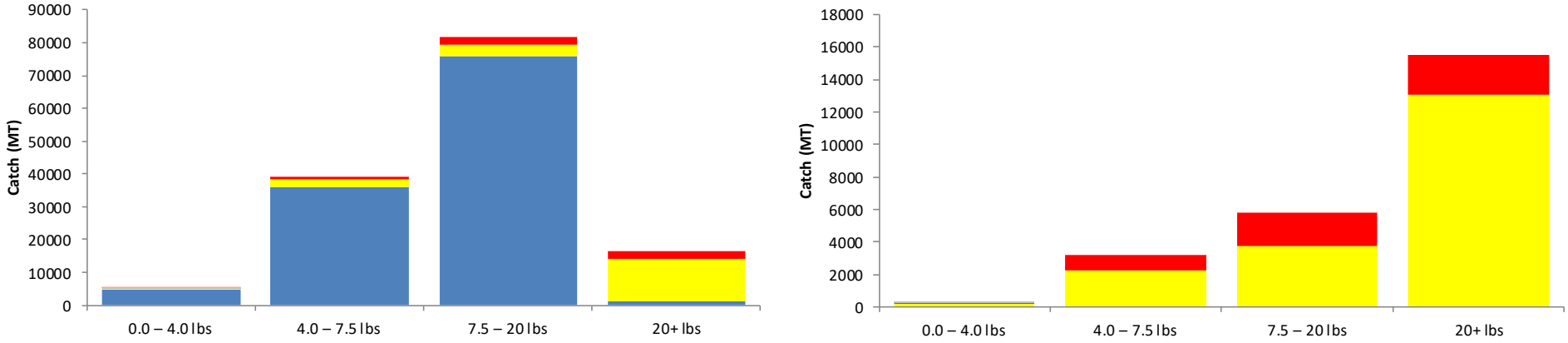

Figure 3. Purse seine tuna species and size composition for the US purse seine fleet 2016 catch.
Left–skipjack tuna (blue), yellowfin tuna (yellow) and bigeye tuna (red)
Right–yellowfin tuna (yellow) and bigeye tuna (red)
(Source: adjusted and raised observer estimates of species and size composition; see Lawson, 2013)

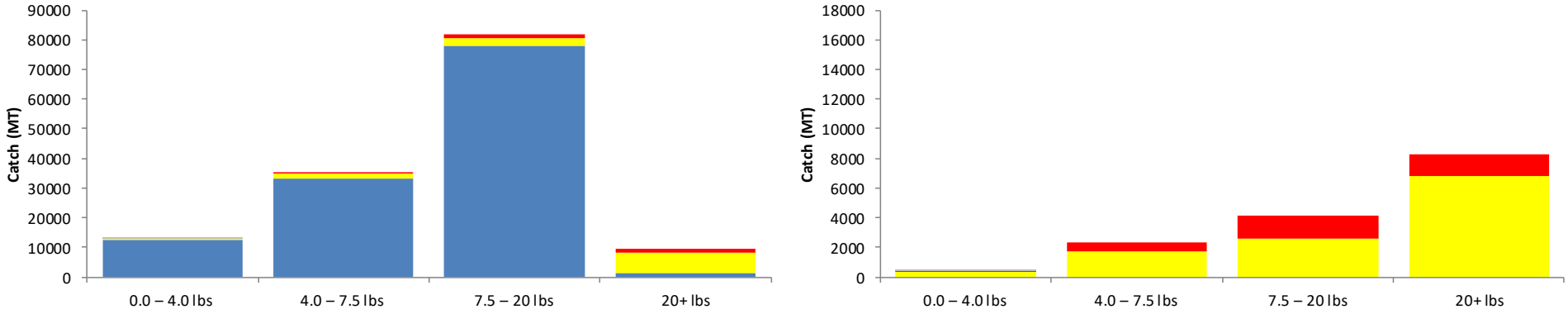

Figure 3. Purse seine tuna species and size composition for the US purse seine fleet 2016 catch.
Left–skipjack tuna (blue), yellowfin tuna (yellow) and bigeye tuna (red)
Right–yellowfin tuna (yellow) and bigeye tuna (red)
(Source: available cannery/processor data, unadjusted)

ANNEX

Draft list of minimum required fields for cannery data submissions of catch from purse seine vessels

Carrier vessel information
- Carrier vessel name
- Carrier vessel flag
- Carrier vessel IMO
- Carrier vessel Call sign
Fishing vessel information
- Fishing vessel name
- Fishing vessel flag
- Fishing vessel IMO
- Fishing vessel Call sign
- Fishing vessel gear type
Start of Unloading at processing plant
End of Unloading at processing plant
RFMO Area where catch taken (e.g. WCPFC Area)
Start date of fishing trip (departure from port of fishing vessel)
End date of fishing trip (return to port of fishing vessel)
Port of offloading or transshipment to Carrier vessel
Coordinates of transshipment at sea (if relevant)
Start date of transshipment from fishing vessel to carrier
End date of transshipment from fishing vessel to carrier
[Actual measured quantities (in kilograms or metric tons to 3 decimal places) of catch received at processing plants in the following commercial size categories]
Skipjack tuna : 0–3 lbs
Skipjack tuna : 3–4 lbs
Skipjack tuna : 4–7.5 lbs
Skipjack tuna : >= 7.5 lbs
Yellowfin tuna : 0–3 lbs
Yellowfin tuna : 3–4 lbs
Yellowfin tuna : 4–7.5 lbs
Yellowfin tuna : 7.5–20 lbs
Yellowfin tuna : >= 20 lbs
Bigeye tuna : 0–3 lbs
Bigeye tuna : 3–4 lbs
Bigeye tuna : 4–7.5 lbs
Bigeye tuna : 7.5–20 lbs
Bigeye tuna : >= 20 lbs