Appendix A: Corrected Retained Catch Size Frequencies in the Directed Tanner crab Fisheries

William Stockhausen

Introduction

An error was discovered following the January 2017 Crab Modeling Workshop (Seattle, WA) in the retained catch size compositions for 2015/16 used in the 2016 assessment (Stockhausen, 2016). This appendix summarizes the re-calculation of the retained catch size frequencies in the directed fishery for crab fishery years 2013/14-2015/16. Fortunately, the errors in the 2015/16 size compositions used in the 2016 assessment, although incorrect, were very close to the correct compositions based on the size frequencies presented here (see Figures 13 and 14 below).

Retained catch abundance and biomass by fishery area

Annual values for retained catch abundance and biomass, provided by ADFG, are shown for 2013/14-2015/16 by EBS Tanner crab fishing area in Figures 1 and 2. Area-specific annual values for retained catch abundance were used to scale area-specific size compositions to area-specific total size frequencies prior to combining the size frequencies to obtain EBS-wide retained catch size frequencies.

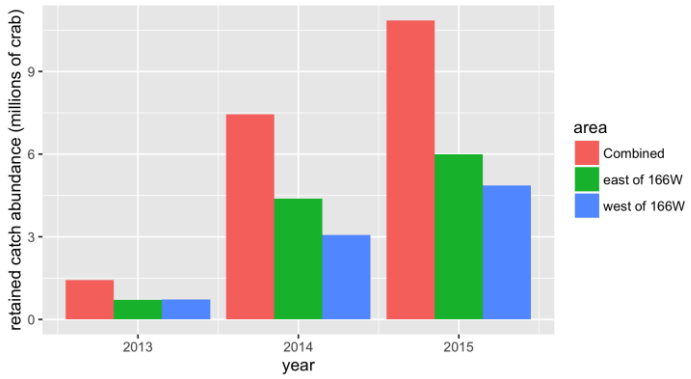

Figure 1. Total retained catch abundance (in millions of crab).

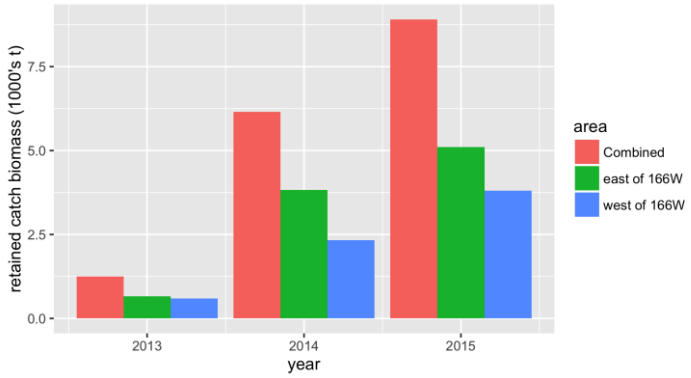

Figure 2. Total retained catch biomass (in 1000's t).

Observed (dockside) retained catch size frequencies by fishery area

Annual observed size frequencies for retained catch of Tanner crab in the directed fisheries in 2013/14-2015/16 are shown in Figures 3-6 by fishing area and shell condition. The set of plots allow direct comparisons between areas (Figures 3, 4) and years (Figures 5, 6).

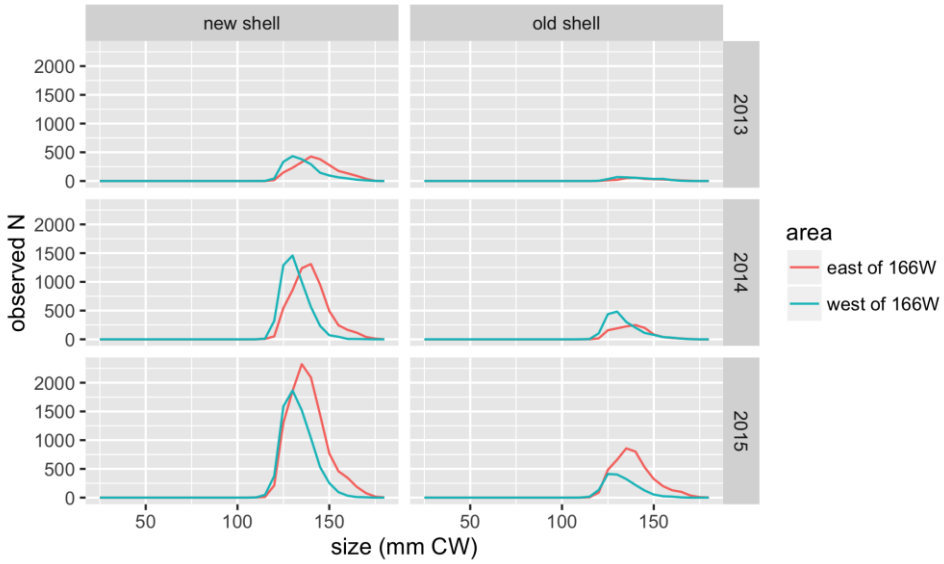

Figure 3. Observed Tanner crab retained catch size frequencies, plots by year and shell condition. All plots on same scale.

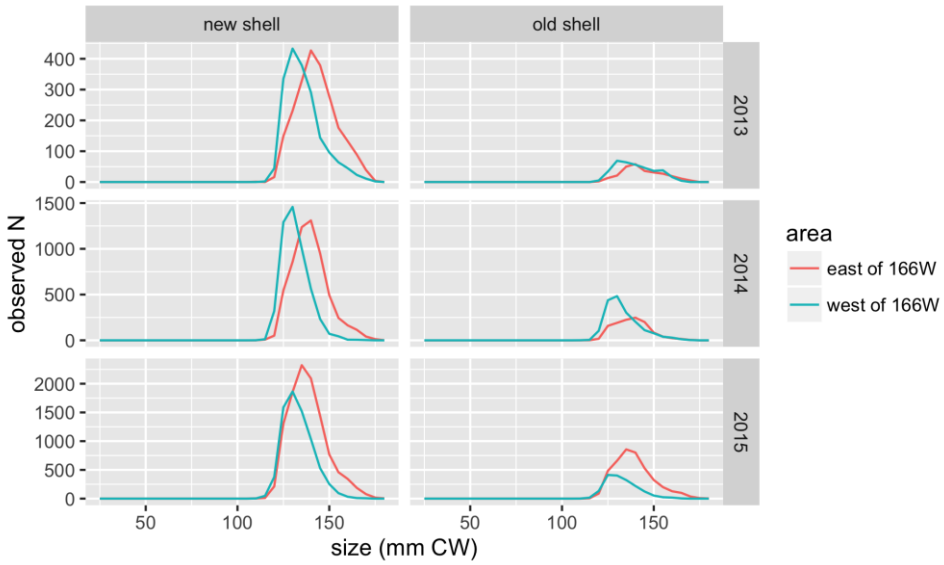

Figure 4. Observed Tanner crab retained catch size frequencies, plots by year and shell condition. Plots on different scales.

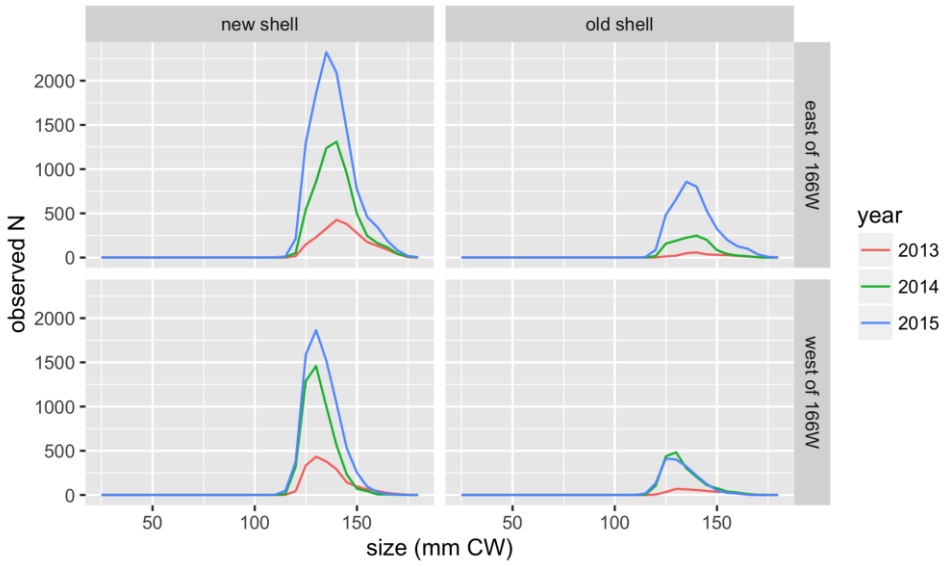

Figure 5. Observed Tanner crab retained catch size frequencies, plots by area and shell condition. All plots on same scale.

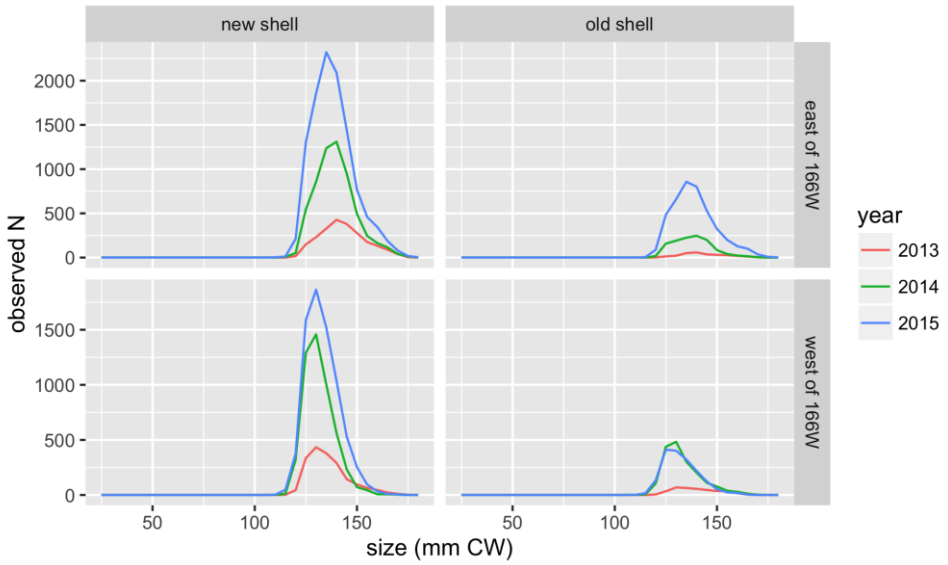

Figure 6. Observed Tanner crab retained catch size frequencies, plots by area and shell condition. Plots on different scales.

Total (expanded) retained catch size frequencies by area

Annual observed (sampled) size frequencies by area and shell condition were scaled to total size frequencies by multiplying the area- and shell condition-specific observed size frequencies by the ratio of the area-specific total retained catch abundance to the sum of the area-specific total observed retained catch abundance (i.e., new shell + old shell).

Sample sizes

The annual numbers of sampled (measured) retained crab are given by fishery area and shell condition in Table 1.

fishery area	year	shell condition	observed number
east of 166W	2013	new shell	2,250
	2013	old shell	273
	2014	new shell	6,031
	2014	old shell	1,205
	2015	new shell	11,101
	2015	old shell	4,224
west of 166W	2013	new shell	1,869
	2013	old shell	368
	2014	new shell	5,012
	2014	old shell	1,807
	2015	new shell	7,364
	2015	old shell	1,731

Table 1. Sample sizes for observed retained catch size compositions.

Size frequencies

The total retained catch size frequencies by fishery area and shell condition are shown in Figures 7-10.

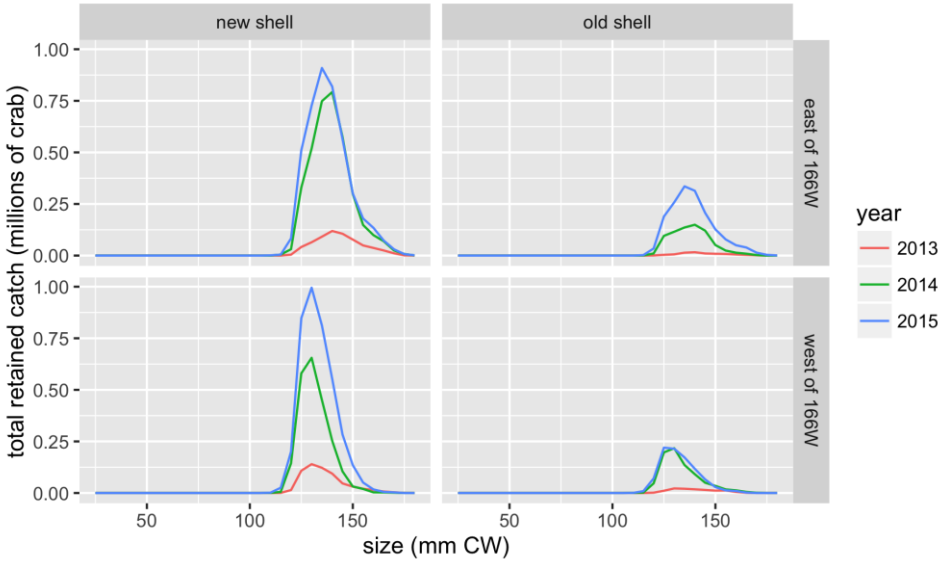

Figure 7. Total (expanded) Tanner crab retained catch size frequencies, by area and shell condition. All plots on same scale.

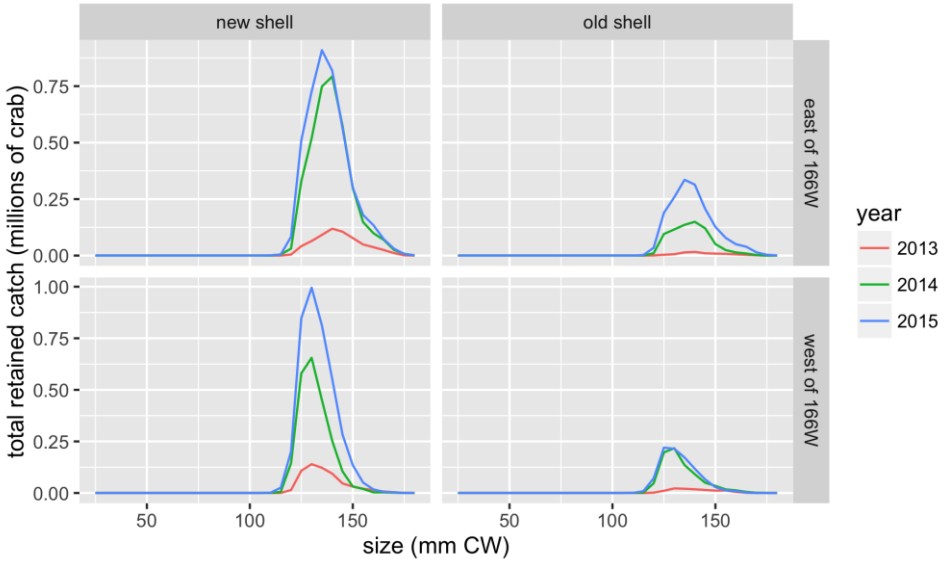

Figure 8. Total (expanded) Tanner crab retained catch size frequencies, by area and shell condition. Plots are on different scales.

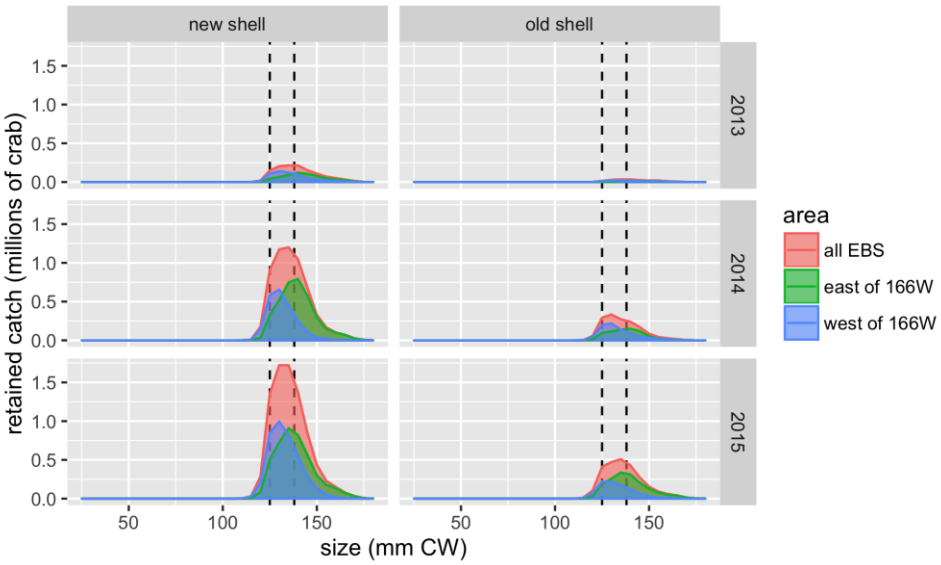

Figure 9. Total (expanded) Tanner crab retained catch size frequencies, by year and shell condition. All plots on same scale. Vertical dashed lines indicate 125 and 138 mm CW sizes.

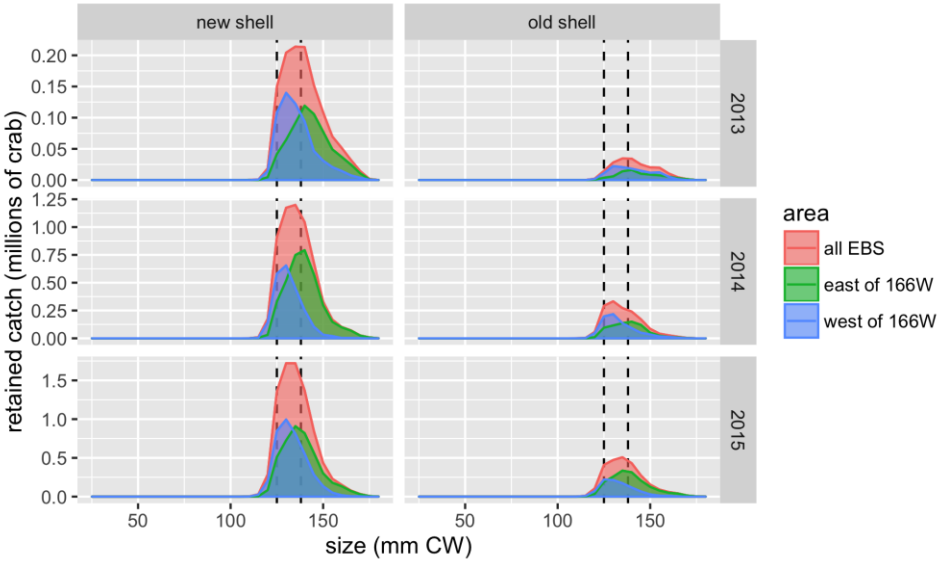

Figure 10. Total (expanded) Tanner crab retained catch size frequencies, by year and shell condition. Plots on different scales. Vertical dashed lines indicate 125 and 138 mm CW sizes.

Size frequencies for the EBS

Annual retained catch size frequencies by shell condition, aggregated across the EBS, were obtained by summing the area-specific versions by size bin (Figures 11 and 12).

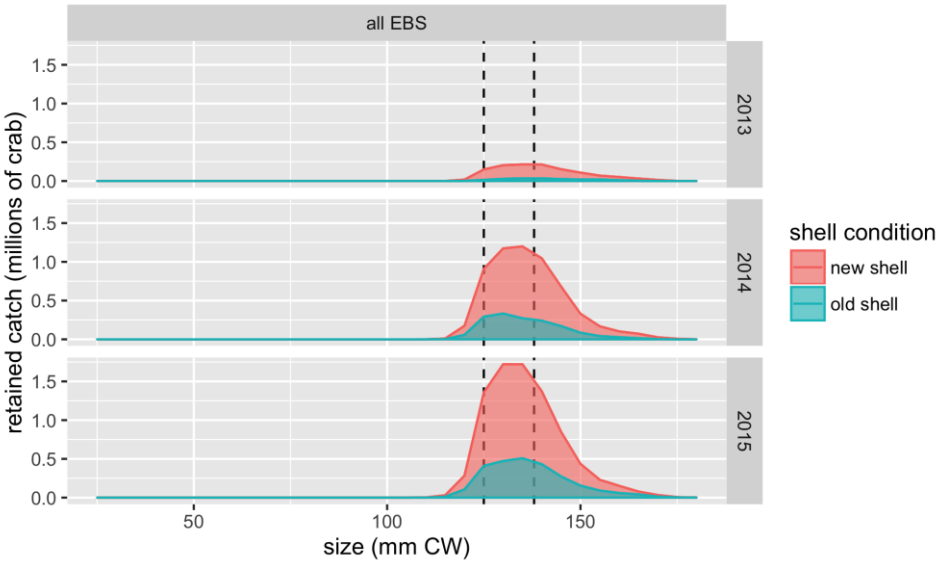

Figure 11. Tanner crab retained catch size frequencies for the EBS, by year and shell condition. All plots on same scale. Vertical dashed lines indicate 125 and 138 mm CW sizes.

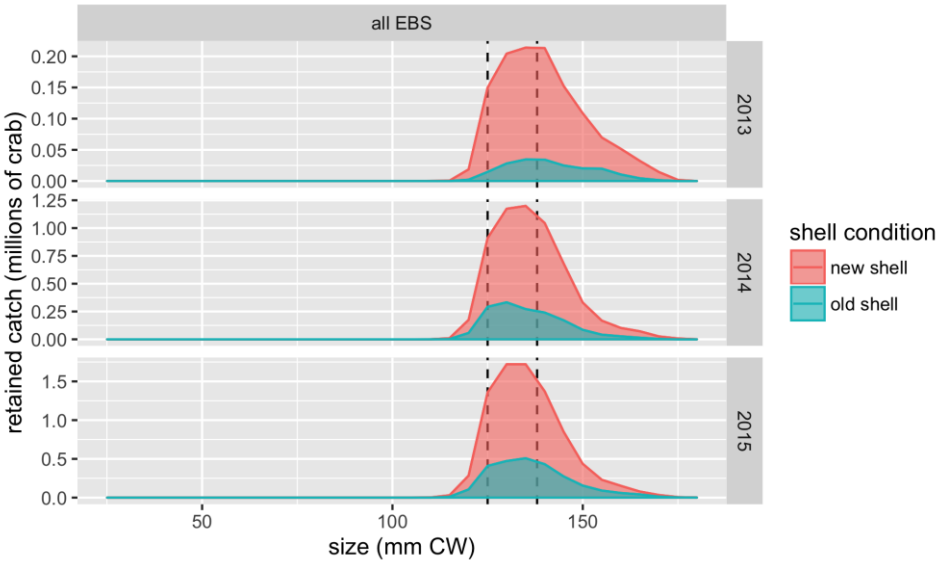

Figure 12. Tanner crab retained catch size frequencies for the EBS, by year and shell condition. Plots on different scales. Vertical dashed lines indicate 125 and 138 mm CW sizes.

Comparison of old and corrected size compositions

The corrected retained catch size compositions for new shell crab are slightly left-shifted to smaller sizes relative to the size composition used in the 2016 assessment, while that for old shell crab exhibits a slightly higher peak in the corrected version relative to that used in the 2016 assessment.

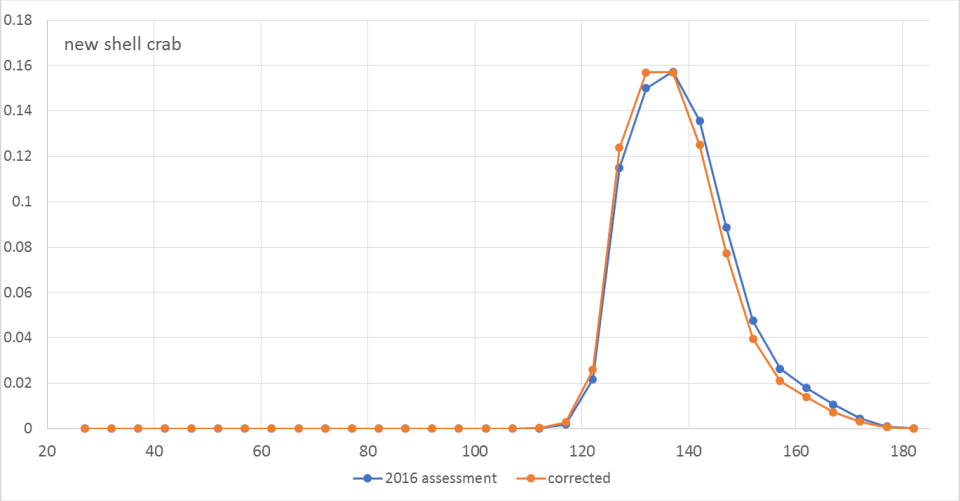

Figure 13. Comparison of corrected EBS-wide retained catch size compositions for new shell crab for 2015/16 (orange line)with that used in the 2016 assessment (blue line).

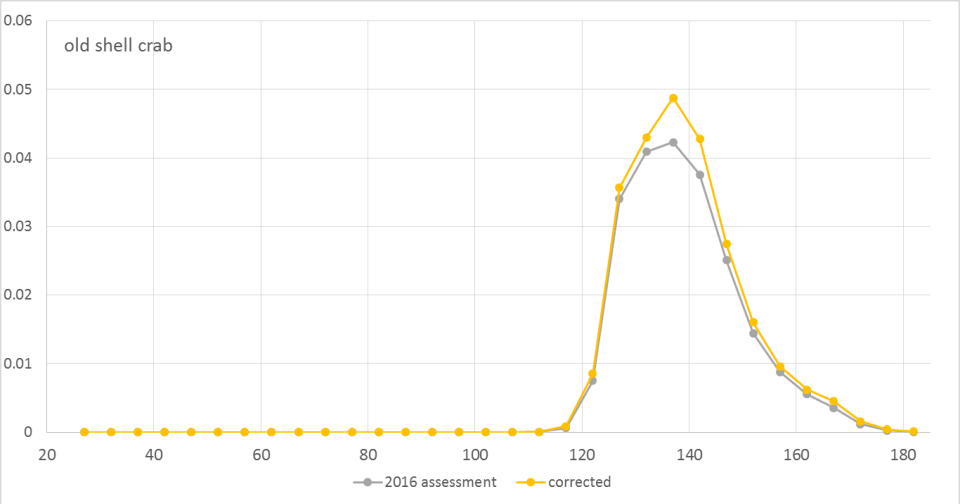

Figure 14. Comparison of corrected EBS-wide retained catch size compositions for old shell crab for 2015/16 (yellow line)with that used in the 2016 assessment (grey line).