

# Supplementary Materials

## Supplementary Tables

Factor	BET F-value	BET p-value	YFT F-value	YFT p-value
Tag mixing	61.10	< <b>0.001</b>	31.77	< <b>0.001</b>
Size-data weighting divisor	4.59	<b>0.015</b>	17.09	< <b>0.001</b>
Age data weighting	0.10	0.909	0.42	0.661
Steepness	2.93	0.062	0.19	0.825

Table S1: ANOVA results for key structural assumptions for bigeye (BET) and yellowfin (YFT) tuna in the retrospective analysis. Bold values indicate statistical significance at  $p < 0.05$ .

Factor	BET F-value	BET p-value	YFT F-value	YFT p-value
Tag mixing	0.52	0.470	0.74	0.390
Size-data weighting divisor	3.47	<b>0.032</b>	1.43	0.242
Age data weighting	0.03	0.972	0.05	0.954
Steepness	0.35	0.703	1.92	0.149
Region	393.89	< <b>0.001</b>	629.58	< <b>0.001</b>

Table S2: ANOVA results for key structural assumptions for bigeye (BET) and yellowfin (YFT) tuna in the hindcast analysis. Bold values indicate statistical significance at  $p < 0.05$ .