10.1071/WR24132

Wildlife Research

Supplementary Material

Evidence for an ecological two-population model for white sharks (*Carcharodon carcharias*) in Australian waters

T. G. Burke[A,*], *C. Huveneers*[B], *L. Meyer*[B], *J. P. W. Hollins*[A], *L. Loseto*[C], *J. M. Werry*[D], *and N. E. Hussey*[A]

[A]Department of Integrative Biology, University of Windsor, Windsor, ONN9B 3P4, Canada. Email: jackhollins1276@gmail.com, nehussey@uwindsor.ca

[B]College of Science and Engineering, Flinders University, Sturt Road, Bedford ParkSA5042, Australia. Email: charlie.huveneers@flinders.edu.au, lauren.meyer@flinders.edu.au

[C]Freshwater Institute, Fisheries and Oceans Canada, 501 University Crescent, Winnipeg, MBR3T 2N6, Canada. Email: lisa.loseto@dfo-mpo.gc.ca

[D]GHD L4, 211 Victoria Square, Adelaide, SA5000, Australia. Email: werryjm@gmail.com

[*]Correspondence to: T. G. Burke University of Windsor, Integrative Biology, 401 Sunset Avenue, Windsor, ON N9B 3P4, Canada Email: burke11j@uwindsor.ca

Supplementary Tables and Figures

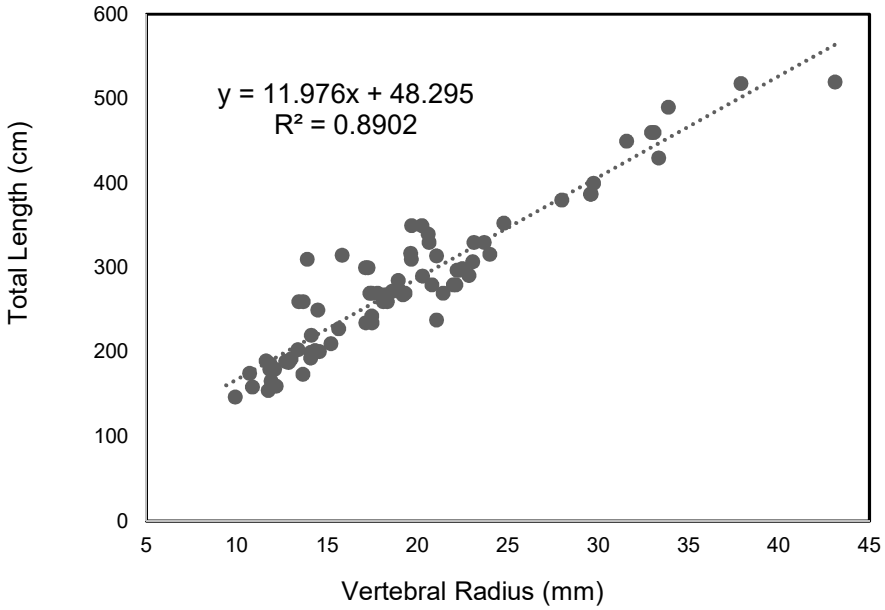

Fig. S1 Linear regression of measured vertebral radius and total length for Australian white sharks (n=77). Linear regression equation derived was used to predict the total length from vertebral radius in a back calculation along with predicting the size of the shark over its lifetime with the corresponding drill points.

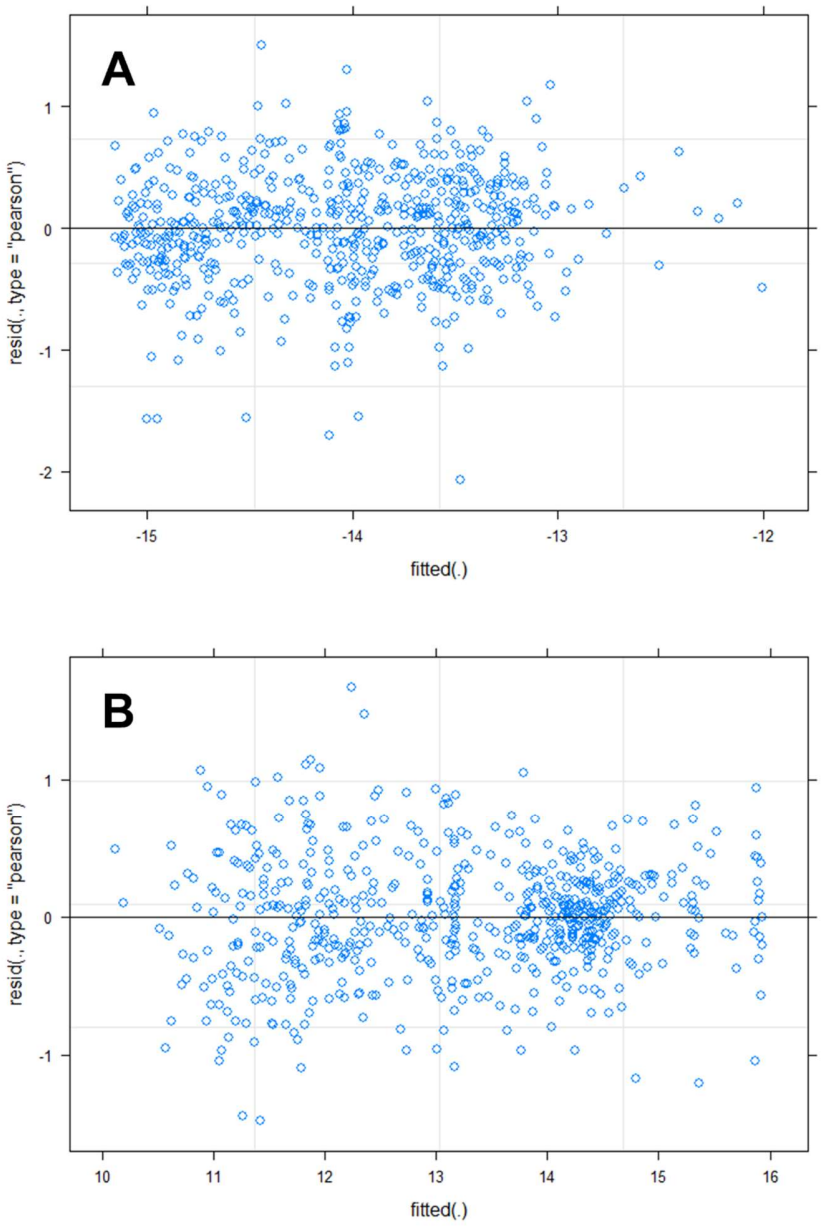

Fig. S2 Visual inspection of residual plots to assess for assumptions of homoscedasticity and normality of residuals for the A) $\delta^{13}C$ and B) $\delta^{15}N$ linear mixed effect models.

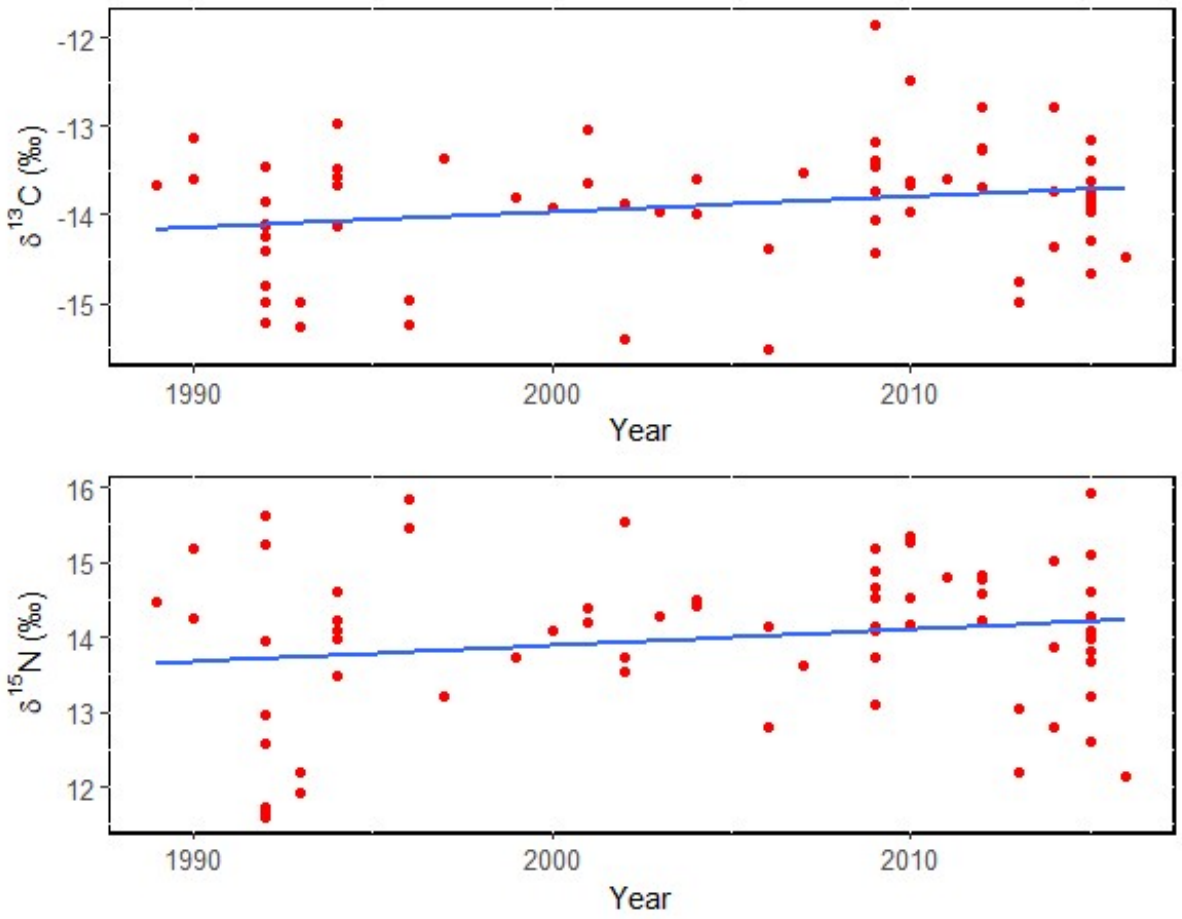

Fig. S3 Linear regression of the year white shark vertebrae were collected/sampled compared to the final stable isotope value ($\delta^{13}C$ and $\delta^{15}N$) of the outermost ring of the *corpus calcareum*.

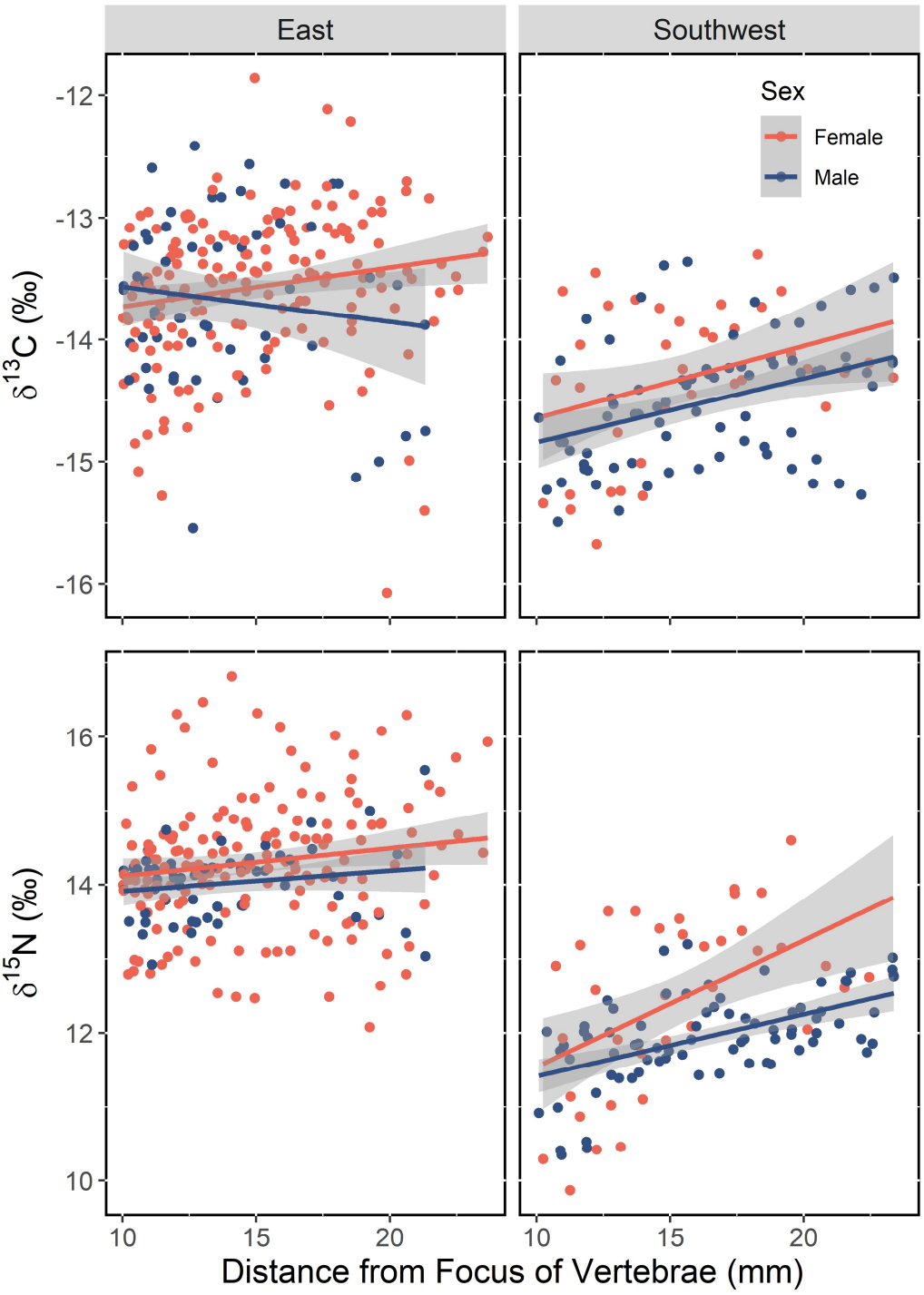

Fig. S4 Effect of sex (n=42) on $\delta^{13}C$ and $\delta^{15}N$ in white sharks from east and southwest subpopulations in Australia. Lines represent linear regression between distance from focus of vertebrae (mm) and $\delta^{13}C/\delta^{15}N$ for each region. The shaded area represents the 95% confidence intervals.

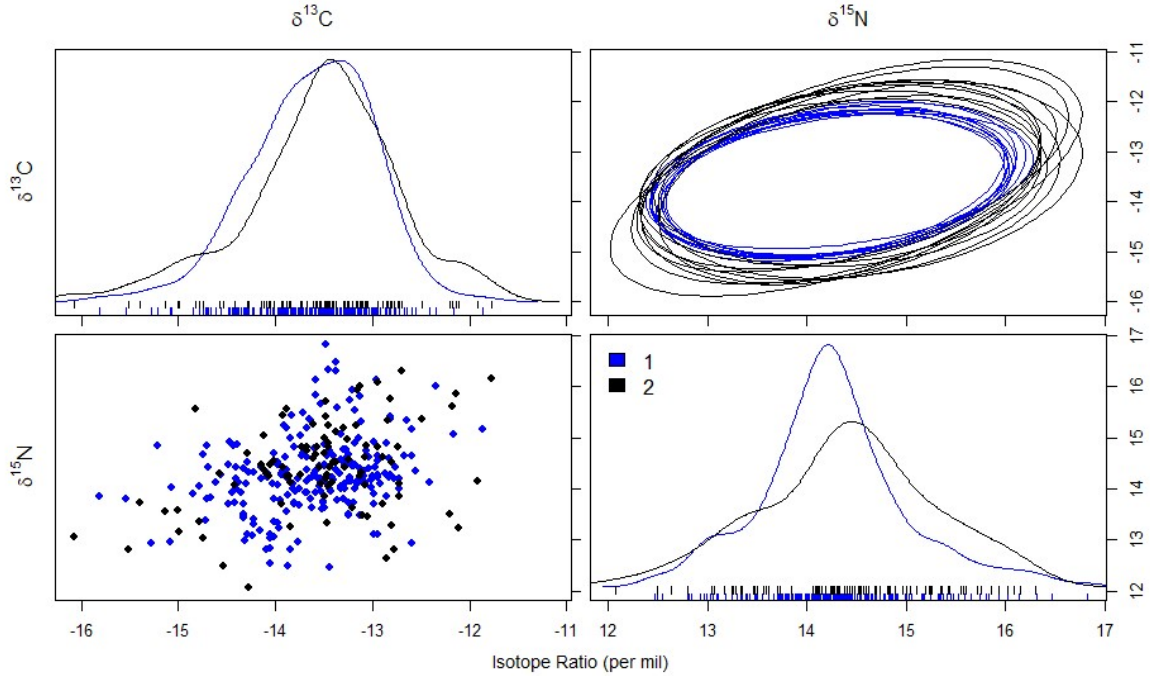

Fig. S5 2-D projections of 10 random elliptical projections of trophic niche region for east Australian white sharks from size class one and two (n=44) generated by Bayesian analysis. One-dimensional density plots (lines), and two-dimensional scatterplots are also displayed in addition to the raw data for each pairwise combination of isotope data for both size classes.

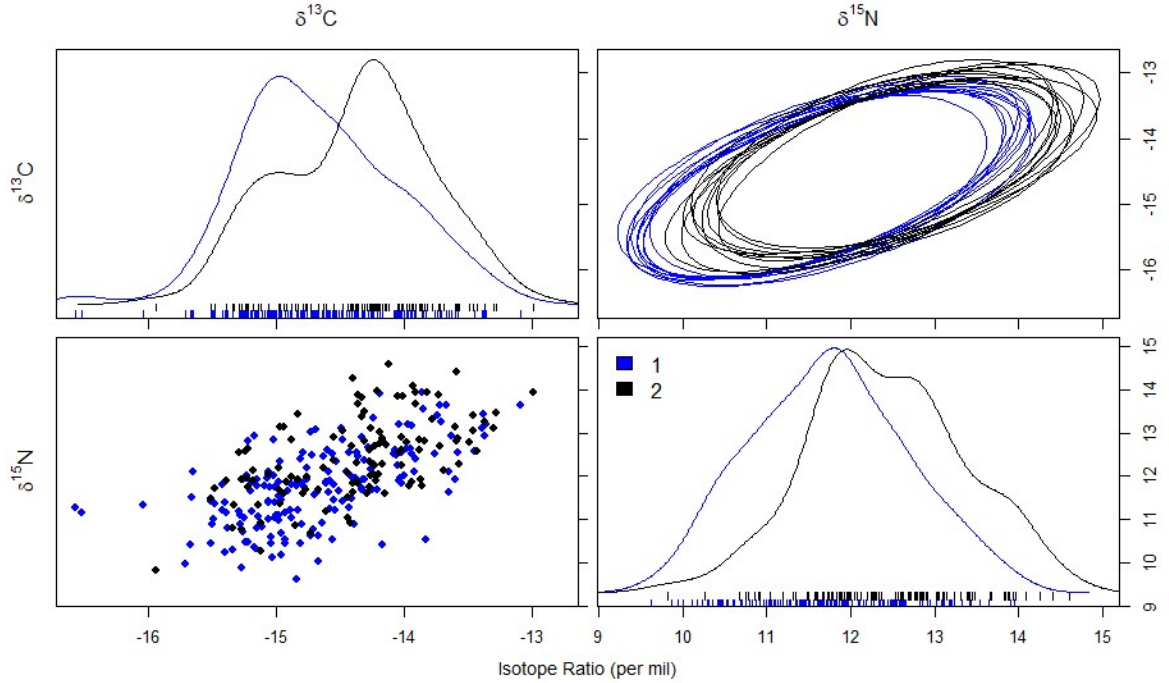

Fig. S6 2-D projections of 10 random elliptical projections of trophic niche region for southwest Australian white sharks from size class one and two (n=26) generated by Bayesian analysis. One-dimensional density plots (lines), and two-dimensional scatterplots are also displayed for each pairwise combination of isotope data for both size classes.

Table S1 Results of linear mixed effects models examining the effect of sex, vertebral measurement, and individual shark ID on bulk carbon ($\delta^{13}C$) and nitrogen ($\delta^{15}N$) stable isotopes from individuals in size class one and two (n=42).

Isotope	Term	Estimate	SE	df	t	*p*	R_m^2	R_c^2
$\delta^{13}C$	Intercept	-14.13	0.18	254.58	-76.47	<0.001	0.31	0.59
	Sex	0.31	0.31	240.15	1.02	0.31		
	Vertebrae measurement	0.037	0.011	320.62	3.33	<0.001		
	Sex*Vertebrae measurement	-0.03	0.02	326.17	-1.33	0.18		
	Region	-1.31	0.37	160.41	-3.5	<0.001		
	Sex*Region	-0.16	0.33	35.59	-0.5	0.62		
	Region*Vertebrae measurement	0.04	0.02	324.9	2.03	0.043		
$\delta^{15}N$	Intercept	13.94	0.23	122.94	60.67	<0.001	0.67	0.82
	Sex	-0.12	0.33	246.1	-0.35	0.72		
	Vertebrae measurement	0.023	0.013	317.57	1.83	0.068		
	Sex*Vertebrae measurement	-0.008	0.021	263.64	-0.4	0.69		
	Region	-3.14	0.48	67.58	-6.59	<0.001		
	Sex*Region	-0.24	0.38	28.9	-0.62	0.54		
	Region*Vertebrae measurement	0.08	0.02	283.27	3.67	<0.001		