

S4 Table. Validation results for the predictions of the single climate envelope, preservation, and discovery models, as well as their combined predictions. We compared the suitability values predicted for grid cells containing fossils with unreliable ages of a given genus (not used to train the models) with the suitability values predicted for 1000 sets of randomly selected grid cells from across Australia using a Kolmogorov-Smirnov test.

Taxon	Prediction	Median Kolmogorov-Smirnov statistic (1 st – 3 rd quartiles)
<i>Diprotodon</i>	Palaeo-climate	0.43 (0.36 – 0.57)
	Preservation	0.29 (0.29 – 0.36)
	Discovery	0.57 (0.50 – 0.64)
	Discovery & Preservation	0.50 (0.43 – 0.57)
	All combined	0.50 (0.43 – 0.64)
<i>Zygomaturus</i>	Palaeo-climate	0.67 (0.56 – 0.67)
	Preservation	0.33 (0.22 – 0.33)
	Discovery	0.78 (0.67 – 0.78)
	Discovery & Preservation	0.56 (0.44 – 0.67)
	All combined	0.67 (0.56 – 0.78)
<i>Protemnodon</i>	Palaeo-climate	0.60 (0.53 – 0.67)
	Preservation	0.33 (0.27 – 0.40)
	Discovery	0.40 (0.33 – 0.47)
	Discovery & Preservation	0.53 (0.46 – 0.67)
	All combined	0.60 (0.53 – 0.67)
<i>Thylacoleo</i>	Palaeo-climate	0.75 (0.75 – 0.88)
	Preservation	0.38 (0.25 – 0.38)
	Discovery	0.63 (0.50 – 0.75)
	Discovery & Preservation	0.50 (0.38 – 0.63)

	All combined	0.88 (0.75 – 0.88)
<i>Genyornis</i>	Palaeo-climate	0.63 (0.50 – 0.63)
	Preservation	0.38 (0.38 – 0.50)
	Discovery	0.25 (0.13 – 0.38)
	Discovery & Preservation	0.48 (0.20 – 0.87)
	All combined	0.63 (0.50 – 0.63)