

[10.1071/PC24001](https://doi.org/10.1071/PC24001)

*Pacific Conservation Biology*

### Supplementary Material

#### **Determining the geographic distribution and ecology of the Critically Endangered Kaputar rock skink (*Egernia roomi*)**

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## SUPPLEMENTARY MATERIAL FILE 1

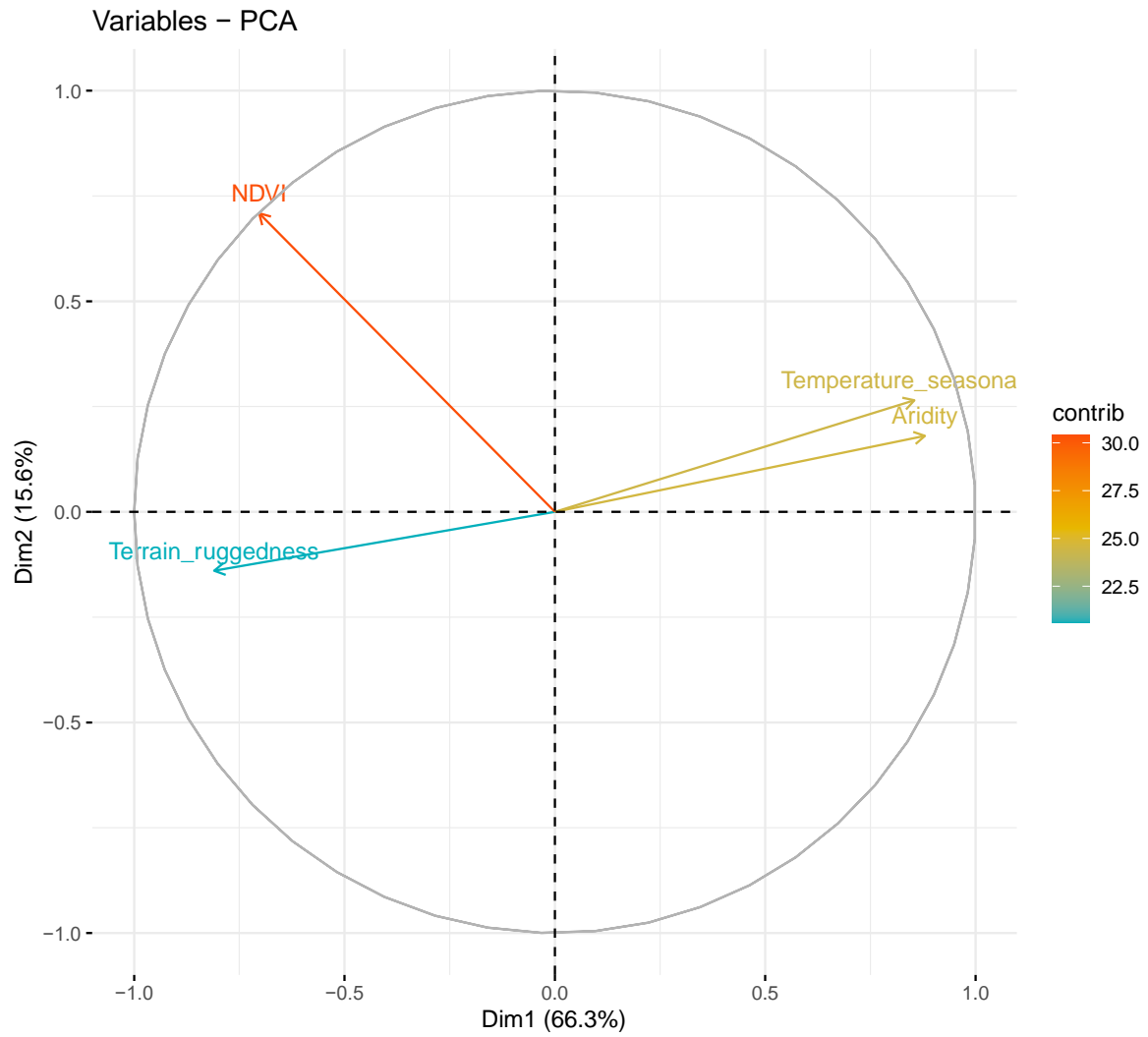


Figure S1. PCA biplot showing correlations among variables for the final set of environmental predictor variables used for habitat suitability modelling.

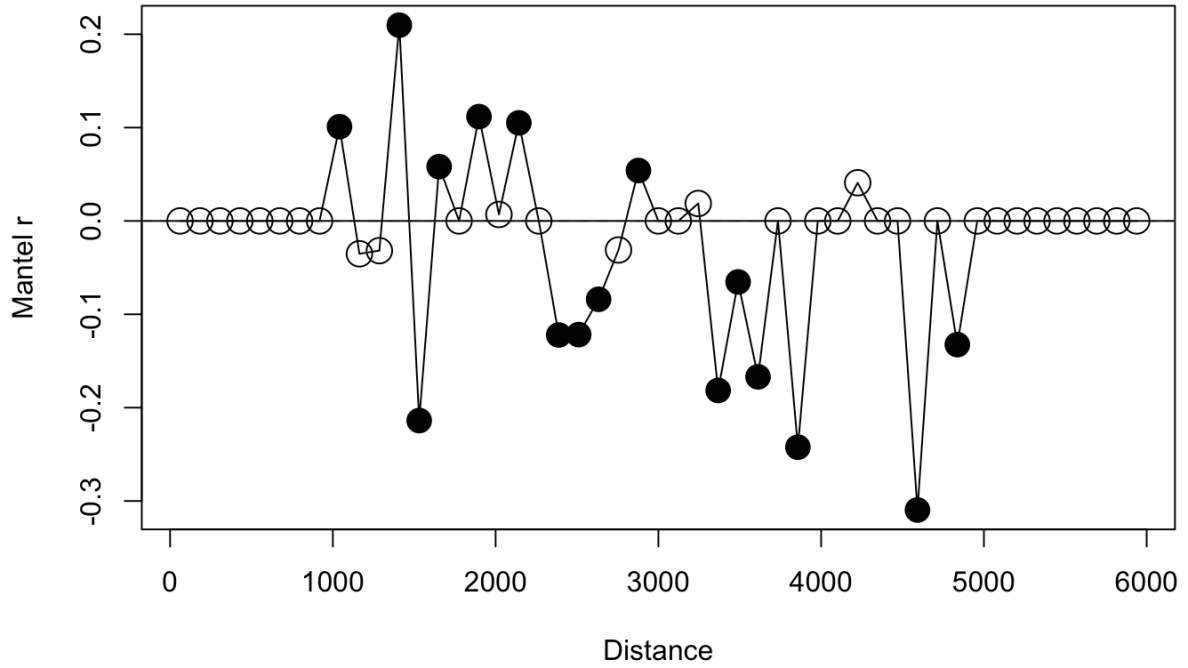


Figure S2. Mantel correlogram showing the spatial autocorrelation of cleaned (A) and thinned (B) species occurrence records at 0 to 6,000 m. The mantle correlogram of the cleaned species occurrence records show a spike in spatial autocorrelation, which potentially indicates spatial non-independence at 0 to 1,000 m.

### Variable contribution

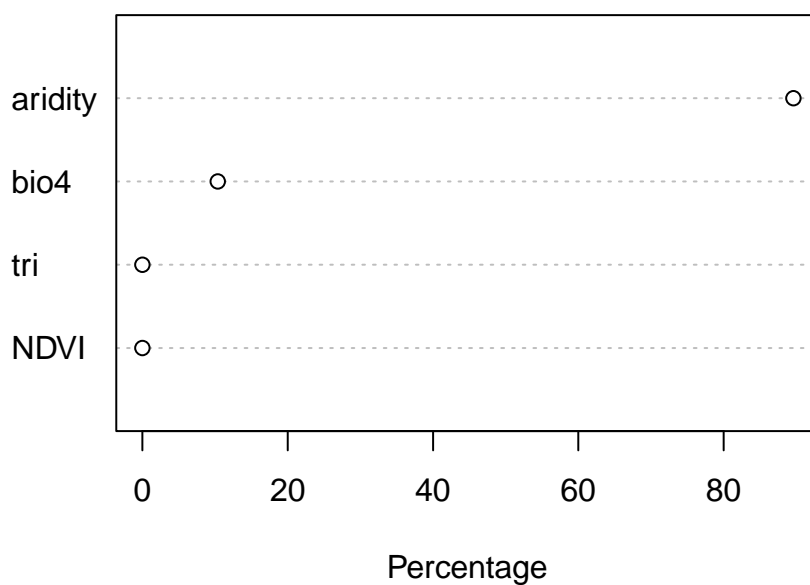


Figure S3. Estimates of relative (%) contributions of environmental predictor variables to the optimal MaxEnt model.

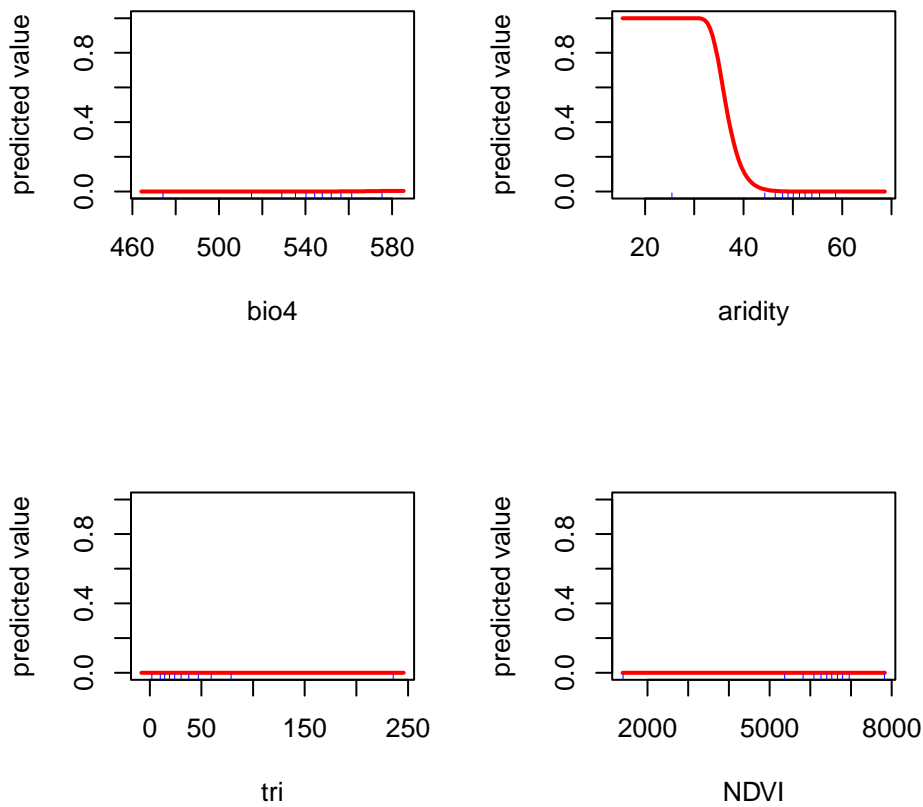


Figure S4. Response curves characterizing how each environmental predictor variable affected the MaxEnt predictions for the best performing model.

Table S1. Full set of environmental predictor variables considered in variable selection for modelling the distribution of *Egernia roomi*. Bold indicates the database and a URL is provided. Italics indicate derived data.

Source/layer	Year	Spatial Resolution
<b>WorldClim v2.1</b>		
( <a href="http://www.worldclim.org/">http://www.worldclim.org/</a> )		
BO1 Annual Mean Temp (°C)	1970–2000	1 x 1 km
BIO2 Mean Diurnal Range (°C)	1970–2000	1 x 1 km

BIO3 Isothermality ( $100 * \text{BIO2} / \text{BIO7}$ )	1970–2000	1 x 1 km
BIO4 Temp Seasonality ( $100 * \text{SD}$ )	1970–2000	1 x 1 km
BIO5 Max Temp of Warmest Month (°C)	1970–2000	1 x 1 km
BIO6 Min Temp of Coldest Month (°C)	1970–2000	1 x 1 km
BIO7 Temp Annual Range (°C) (BIO5–BIO6)	1970–2000	1 x 1 km
BIO8 Mean Temp of Wettest Quarter (°C)	1970–2000	1 x 1 km
BIO9 Mean Temp of Driest Quarter (°C)	1970–2000	1 x 1 km
BIO10 Mean Temp of Warmest Quarter (°C)	1970–2000	1 x 1 km
BIO11 Mean Temp of Coldest Quarter (°C)	1970–2000	1 x 1 km
BIO12 Annual Precip (mm)	1970–2000	1 x 1 km
BIO13 Precip of Wettest Month (mm)	1970–2000	1 x 1 km
BIO14 Precip of Driest Month (mm)	1970–2000	1 x 1 km
BIO15 Precip Seasonality (CV)	1970–2000	1 x 1 km
BIO16 Precip of Wettest Quarter (mm)	1970–2000	1 x 1 km
BIO17 Precip of Driest Quarter (mm)	1970–2000	1 x 1 km
BIO18 Precip of Warmest Quarter (mm)	1970–2000	1 x 1 km
BIO19 Precip of Coldest Quarter (mm)	1970–2000	1 x 1 km
<b>ENVIREM</b>		
<a href="https://envirem.github.io/">(https://envirem.github.io/)</a>		
Thornthwaite aridity index	1960–1990	1 x 1 km
tri — terrain roughness index	NA	1 x 1 km
topoWet — SAGA-GIS topographic wetness index	NA	1 x 1 km
<b>Geoscience Australia</b>		
<a href="http://www.ga.gov.au/search/index.html#/">(http://www.ga.gov.au/search/index.html#/)</a>		
<i>Euclidean Distance to Water Courses</i>	NA	1 x 1 km
<i>Euclidean Distance to Water Bodies</i>	NA	1 x 1 km
<b>Terrestrial Ecosystem Research Network (TERN)</b>		
<a href="https://www.tern.org.au/">(https://www.tern.org.au/)</a>		
Total Available Soil Water (mm)	in February, 2022	1 x 1 km
<b>NASA Earthdata</b>		
<a href="https://earthdata.nasa.gov/">(https://earthdata.nasa.gov/)</a>		

Normalized Difference Vegetation Index (NDVI) (MOD13A3)	in December, 2000–2021	1 x 1 km
<b>Socioeconomic Data and Applications Center</b> (sedac) ( <a href="https://sedac.ciesin.columbia.edu/">https://sedac.ciesin.columbia.edu/</a> )		
Global Human Influence Index (Geographic) v2	1995–2004	1 x 1 km

Table S2. Metrics used to evaluate the performance of models.

Evaluation metrics	Description
<b>AICc</b> Akaike (1974); Warren and Seifert (2011)	Akaike Information Criterion (corrected for small sample sizes; AICc). This is a widely used model selection criteria that balances model complexity with goodness-of-fit. The model with the lowest AICc value is selected as the optimal model.
<b>AUC<sub>TEST</sub></b> Hanley and McNeil (1982)	The Area Under the Receiver Operating Characteristic (ROC) Curve (AUC) based on the predicted values of the testing dataset. We interpreted the AUC <sub>test</sub> values based on Swets (1988), where values >0.90 = excellent, >0.80-0.90 = good, >0.70-0.80 = fair, >0.60-0.70 = poor, and >0.50-0.60 = fail.
<b>AUC<sub>DIFF</sub></b> Warren and Seifert (2011)	The difference between the AUC value based on training localities (AUC <sub>TRAIN</sub> ) and AUC <sub>TEST</sub> ; If AUC <sub>TRAIN</sub> < AUC <sub>TEST</sub> , the returned value is zero. Increasing values of AUC <sub>DIFF</sub> indicate increasing model overfitting to the training dataset.
<b>OR<sub>mtp</sub></b> Fielding and Bell (1997)	Omission rate at a minimum training presence threshold (OR <sub>MTP</sub> ) – that is, the proportion of occurrence records in testing dataset located in areas with predicted suitability values (MaxEnt relative occurrence rates) lower than that associated with the lowest-ranking occurrence record in the training dataset. OR <sub>MTP</sub> scores closer to the expected score of zero indicate low or minimal model overfitting to training dataset.
<b>OR<sub>10</sub></b> Fielding and Bell (1997)	Omission rate at 10% training threshold (OR <sub>10</sub> ) – that is, the proportion of occurrence records in test datasets located in areas with predicted suitability values (MaxEnt relative occurrence rates) lower than that excluding the 10% of training localities with the lowest predicted suitability. OR <sub>10</sub> scores closer to the expected score of 10% indicate low or minimal model overfitting to training dataset.
<b>Boyce Index (BI)</b> Boyce <i>et al.</i> (2002); Hirzel <i>et al.</i> (2006)	The Boyce index measures the deviation of model predictions from a random distribution of the observed presences across the prediction gradients (Boyce <i>et al.</i> 2002). Values range between - 1 and +1; positive values (towards +1) indicate good to perfect predictions, zero or near-zero indicates predictions that are no different from random, and negative values (towards - 1) indicate counter-predictions.

**Table S3.**

Survey sites, including previously known skink locations. Site naming conventions follow those on the Avenza NSW topographic series maps or were given names that best describe the site location/landform.

Site ID	Site name	Declared wilderness area	Site coordinates	Elevation range (m)	<i>E. roomi</i> presence
A	Summit	N/A	-30.273414, 150.164578	1450– 1509	<b>Yes</b>
B	Mt Dowe	N/A	-30.283506, 150.16597	1420– 1440	<b>Yes</b>
C	The Governor	N/A	-30.282882, 150.143237	1350– 1370	<b>Yes</b>
1	Mt Yulludunida	Rusden	-30.286125, 150.080707	1100– 1160	No
2	Mt Coryah	Rusden	-30.279791, 150.121298	1330– 1360	No
3	Governor Lowers	N/A	-30.282463, 150.141081	1220– 1270	No
4	Coryah Gap Firetrail	N/A	-30.291401, 150.140762	1170– 1180	No
5	Governor Cliffs	N/A	-30.277177, 150.154044	1390– 1420	No
6	Rocky Plateau Firetrail	N/A	-30.288427, 150.149658	1380– 1400	No
7	Rangers Lookout	Rusden	-30.295769, 150.156525	1250– 1280	No
8	Lairds Lookout	Rusden	-30.305924, 150.152938	1140– 1180	No
9	Sinclair Peak	N/A	-30.284581, 150.152007	1410– 1420	<b>Yes</b>
10	West Kaputar Rocks	N/A	-30.274766, 150.155853	1380– 1450	<b>Yes</b>
11	Summit East	N/A	-30.271769, 150.167583	1390– 1450	<b>Yes</b>
12	Eckford Lookout	N/A	-30.288235, 150.164986	1360– 1380	<b>Yes</b>
13	Dawson Rocks	N/A	-30.282022, 150.168427	1420– 1430	<b>Yes</b>

14	Bundabulla Lookout	N/A	-30.290296, 150.171228	1300– 1380	<b>Yes</b>
15	West Bundabulla Cliffs	Rusden	-30.295725, 150.173039	1170– 1300	<b>Yes</b>
16	West Bundabulla south	Rusden	-30.3084, 150.178123	1070– 1150	No
17	East Bundabulla south	Rusden	-30.312749, 150.185042	1050– 1100	No
18	East Bundabulla Cliffs	Rusden	-30.297344, 150.178649	1140– 1300	<b>Yes</b>
19	Mt Lindsay South	Rusden	-30.291683, 150.177269	1320– 1360	<b>Yes</b>
20	Mt Lindsay	N/A	-30.283027, 150.175668	1360– 1420	<b>Yes</b>
21	Mt Lindsay Loweres	N/A	-30.280533, 150.180734	1350– 1380	<b>Yes</b>
22	Barraba Junction	N/A	-30.27915, 150.172935	1400– 1420	<b>Yes</b>
23	Pound Mtn South Aspect	Nandewar	-30.227549, 150.154832	1080– 1210	No
24	North Capel Spur	Nandewar	-30.25453, 150.170496	1060– 1090	No
25	Lindesay Rocks	N/A	-30.28671, 150.186727	1270– 1320	<b>Yes</b>
26	Brushy Mtn	N/A	-30.303591, 150.201272	1140– 1180	No
27	Horton Headwaters South	Nandewar	-30.283679, 150.199864	1190– 1250	<b>Yes</b>
28	Horton Headwaters North	Nandewar	-30.276341, 150.195141	1280– 1310	<b>Yes</b>
29	Mt Capel	Nandewar	-30.264258, 150.179994	1310– 1430	No
30	Grattai Mtn	Grattai	-30.090778, 150.064035	1160– 1303	No

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