

Ecography

ECOG-02871

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Supplementary material

Figure A2. Map of sampling locations and occurrence data at Mpala Research Centre (MRC). Inset shows location of MRC within Kenya. Red boxes indicate 75, 1km² sampling locations repeatedly surveyed for *T. deckeni*. Yellow triangles indicate areas where *T. deckeni* were repeatedly observed during 2011 – 2015.

Observed environmental variable	Description	Data source(s) (native grain)	Environment grain	Grain threshold
Distance to water	Distance to centroid of nearest grid cell classified as water	Supervised land cover classification of Quickbird imagery (5m)	971	> 1000m
Elevation	Elevation above sea level (m)	ASTER Global Digital Elevation Model v2 (30m)	38441	> 1000m
Kauth-Thomas Brightness	Weighted recombination of spectral bands that isolates soil reflectance (Kauth and Thomas, 1976)	Quickbird imagery (0.6m)	3342	> 1000m
Kauth-Thomas Wetness	Weighted recombination of spectral bands that isolates soil moisture (Kauth and Thomas, 1976)	Quickbird imagery (0.6m)	21897	> 1000m
Normalized Difference Vegetation Index (NDVI)	Index of infrared and red spectral bands that emphasizes photosynthetically active plant tissue	Quickbird imagery (0.6m)	911	1000m
Precipitation	Long-term mean annual precipitation	Co-kriging of compiled rain gauge data with KTW and elevation (1km)	42339	> 1000m
Vegetation structure complexity (SCI)	Index calculated from field measurements of vegetation structure, predicted across MRC	Quickbird imagery and image texture (5m)	481	500m
Proportion closed shrubland	Proportion of grid cell with woody vegetation <2m tall and shrub canopy cover >60%	Supervised land cover classification of Quickbird imagery (5m)	382	1000m
Proportion grassland	Proportion of grid cell with woody vegetation <2m tall, shrub canopy cover <10% and herbaceous understory cover >20%	Supervised land cover classification of Quickbird imagery (5m)	2601	1000m
Proportion open shrubland with open understory	Proportion of grid cell with woody vegetation <2m tall, shrub canopy cover 10-60%, and herbaceous understory cover <20%	Supervised land cover classification of Quickbird imagery (5m)	879	1000m
Proportion open shrubland with	Proportion of grid cell with woody vegetation <2m tall,	Supervised land cover classification of	430	1000m

herbaceous understory	shrub canopy cover <10%, and herbaceous understory cover >20%	Quickbird imagery (5m)		
Distance to nearest shrub	Distance to nearest 10m grid cell containing shrubs	Quickbird imagery (0.6m)	392	1000m
Shrub density	Proportion of component grid cells containing shrubs	Moving window analysis of Quickbird imagery (5m)	565	1000m
Slope	Angle between horizontal plane and land surface	ASTER Global Digital Elevation Model v2 (30m)	613	1000m
Total annual insolation	Total direct solar radiation intercepted by land surface of grid cell over one year	ASTER Global Digital Elevation Model v2 (30m)	2279	> 1000m
Topographic complexity index (TCI)	Ratio of land surface area to planimetric area	ASTER Global Digital Elevation Model v2 (30m)	546	1000m

Table A1. Derivation, spatial structure, and analysis grain threshold for all observed environmental variables.