**Supplementary materials: Methods**

Appendix S1

**Methods**

*Aspect and Slope*

The following was undertaken to determine the slope and aspect of the terrain preferred by the birds. All localities (n = 3,546) with coordinates of where the Southern Black Korhaan has been recorded was obtained from BirdLasser (https://www.birdlasser.com/) on the 19 August 2021. The first record of the Southern Black Korhaan collected using BirdLasser was on the 01 March 2014. Birdlasser permits observers to designate an observation as one of three levels of accuracy – default, ‘within 500 m’, and ‘exact’. The first two methods record the locality of the observer when logging an observation. The third, ‘exact’ is specified by the observer when they have recorded the locality of the bird and not their locality when recording an observation. To determine the slope and elevation ranges occupied by the Southern Black Korhaan at a resolution of 30 m the ‘exact’ records were extracted from the BirdLasser data (Figure S2b). To reduce spatial autocorrelation the Species Distribution Modelling Toolbox 2.0 (Brown *et al*. 2017) was used in ArcMap 10.8 (ESRI Inc. 2020) to retain exact localities of where the birds were recorded 2 km or further apart. The same number of random points as the number of exact observations retained, were generated 2 km or more apart throughout the distributional range of the Southern Black Korhaan. This was done to determine the background distributions of the available slope and elevation ranges. This was done using the tool ‘Create Random Points’ in the ArcMap 10.8 (ESRI Inc. 2020) ArcToolbox.

The slope (degrees) and aspect (degrees from true north) of the terrain of the Southern Black Korhaan’s distribution was calculated using a 30 m digital elevation model (DEM) projected to UTM-34S using the Aspect, and Slope functions in Spatial Analyst in ArcMap 10.8 (ESRI Inc. 2020). The slope and aspect that corresponds with each of the exact observations and random points was determined using the ‘Extract Values to Points’ function in Spatial Analyst in ArcMap 10.8 (ESRI Inc. 2020). The mean of the slopes at the exact observations were compared with those of the random points using a Mann Whitney U-test. The means of the aspects of the exact observations and random points were compared using the Watson-Williams test of the homogeneity of means in the R library ‘circular’ (Agostinelli and Lund 2017).

Appendix S2

**Methods**

*Land use land cover categories and Southern Black Korhaan habitat*

The LULC map produced in 1990 (Geoterraimage 2015a, 2016) corresponds to the the end of SABAP1. Similarly, the LULC maps produced in 2014 (Geoterraimage 2015b), and 2020 (Department of Environment, Forestry and Fisheries 2021) each represent what the LULC was at these two periods of time during the implementation of SABAP2. All vector (e.g. SABAP2) and raster (e.g. LULC) maps were projected to UTM-34S prior to analyses. The 1990 and 2014 LULC maps have an overall map accuracy of 81.73%, and a Kappa Index of 80.31 (Supplementary Table S1) (Geoterraimage 2016). The 2020 LULC map has an overall map accuracy of 85.47% and a Kappa Index of 85.13 (Department of Environment, Forestry and Fisheries 2021). The Kappa Indices indicate that the classification of the LULC categories in these three maps are unlikely to be the result of chance occurrence (Geoterraimage 2016). No technique currently exists for incorporating data on the accuracy with which the LULC categories and maps were produced into assessments. The accuracy with which the LULC categories and maps were produced are not considered in assessments of LULC change (Pontius *et al.* 2004, Evans 2017, Moncrieff 2021). Each of the LULC categories are mapped at less than 100% accuracy.

Eight hundred and twenty eight records (default, ‘within 500m’, and ‘exact’) of Southern Black Korhaan obtained in 2018-2020 using BirdLasser were used to determine in which biomes the birds have been recorded (Figure S2b, Table S2). To reduce spatial autocorrelation 2018-2020 localities of where the birds were recorded 2 km or further apart where retained. The same number of random points as the number of 2018-2020 observations retained, were generated 2 km or more apart throughout the distributional range of the Southern Black Korhaan. The number of observations and random points per biome were compared using a chi-square test to determine if the birds prefer any of the biomes or azonal, and non-terrestrial areas in their distributional range (South African National Biodiversity Institute 2006-2018).

All LULC categories that may represent suitable habitat for the birds were identified (Supplementary Tables S3 and S4) based on descriptions of the habitat used by the birds (Allan 1997a and 2005). Beta regressions were initially conducted by including all LULC categories identified as potentially suitable habitat for the birds (Supplementary Tables S3 and S4).Subsequently, the total surface area per LULC category per pentad that were significantly (P < 0.01) positively correlated with the birds reporting rate in the beta regressions were considered to represent potentially suitable habitat for the birds. In addition to this, the ‘exact’ locality data collected using BirdLasser in 2018-2020 (a subset of the previously mentioned exact data) was used to assess the LULC categories that potentially describe suitable habitat for Southern Black Korhaan (Supplementary Table S5). As LULC changes over time, the exact localities used for this assessment were limited to those collected in 2018-2020 and to use of the 2020 land use land cover map.

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