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Modeling habitat suitability for the Sri Lanka Grey Hornbill (*Ocyceros gingalensis*) and Malabar Pied Hornbill (*Anthracoceros cornatus*); a GIS approach

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A predictive spatial model was developed In order to identify specific habitat characteristics and distribution pattern of Sri Lanka Grey Hornbill (*Ocyceros gingalensis*) and Malabar Pied Hornbill (*Anthracoceros cornatus*) at the Giritale Nature Reserve in the North-Central province of Sri Lanka. Hornbills were surveyed between March 2006 and February 2007. Randomly selected line transacts were traversed slowly on foot between 06:00 – 11:00 hrs in each month. Coordinates of points were recorded in 150 m intervals using a global positioning system (GPS). Twenty five meter buffer was created for every point. The points around which hornbills were observed was recorded as present sites and others were recorded as absent sites. Height, distance to the water bodies and habitat complexity were taken as potential predictor variables. Triangulated Irregular Network (TIN) was created by using contour layers of 1:50,000 topographic maps. TIN was converted in to 25 m resolution Digital Elevation Model (DEM). Initial DEM was converted in to polygon shape file. Habitat complexity was used as an index of vegetation structure that incorporated tree canopy, shrub canopy and ground herbage coverage. Sample points were selected for each land use category and percentage of canopy cover, opening above 15 m, shrub canopy bellow 15 m and ground herbage coverage was recorded. Average values for each category was applied in to different land use classes of the area. Present and absent areas that were input into GIS and landscape values were extracted using ArcGIS (ESRI, 2001). Stepwise regression was performed to develop the distribution model of the hornbill according to habitat variables. The results indicated a significant correlation between the presence of hornbills and distance to water bodies, height and percentage of canopy cover while stepwise regression removed the percentage of opening above 15 m, shrub canopy bellow 15 m and ground herbage coverage from the model. The observed positive association between increasing canopy cover and presence of hornbills also indicated that they prefer a dense vertical vegetation structure. However, a validity test should be conducted to confirm the findings of this study.
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