

Response of a cryptic apex predator to a complete urban to forest gradient

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Supplementary Material S1. Normalised difference vegetation index (NDVI) and land cover-layer production.

Table S1. Correlation analysis of the 10 Eco-geographical variables (EGVs) conducted in ENM tools.

Fig. S1. Response curves for final powerful owl species distribution modelling (SDM).

Supplementary Material S1. Normalised difference vegetation index (NDVI) and land cover-layer production

Environment for Visualizing 4.7 (ENVI 4.7) was used to create a normalised difference vegetation index (NDVI). NDVI is calculated by

$$NDVI = \frac{(a_{nir} - a_{vis})}{(a_{nir} + a_{vis})}, (1)$$

where a_{vis} equates to the average surface reflectance in the visible ($\lambda \sim 0.6$) wavelengths of the spectrum and a_{nir} is the average surface reflectance in the near-infrared ($\lambda \sim 0.8$) wavelengths of the spectrum (Adams and Gillespie 2006; Carlson and Ripley 1997; Cohen and Goward 2004; Lillesand *et al.* 2008). In an ecological sense, the output from the NDVI is a relative greenness index measuring the amount of live synthesising vegetation present across the surface of a landscape (Leslie *et al.* 2010).

The NDVI for the purpose of this research was created from four high-resolution SPOT 10 (Système Pour l'Observation de la Terre) images with a pixel size of 10 m \times 10 m. Two of these images were collected on 21 December 2008 and the other two on the 26 January 2009 by satellites. Before the NDVI could be created, images had to have the four wavelengths specified, undergo atmospheric correction and also correct for any brightness/contrast differences between images. Corrected images were then mosaicked together, using one image as the base and a feathering distance of 100 pixels as the overlap between each image (ITT Visual Information Solutions 2010b). This created a near seamless image of the original four satellite images which was used to create the NDVI.

Normalised difference vegetation index (NDVI) production

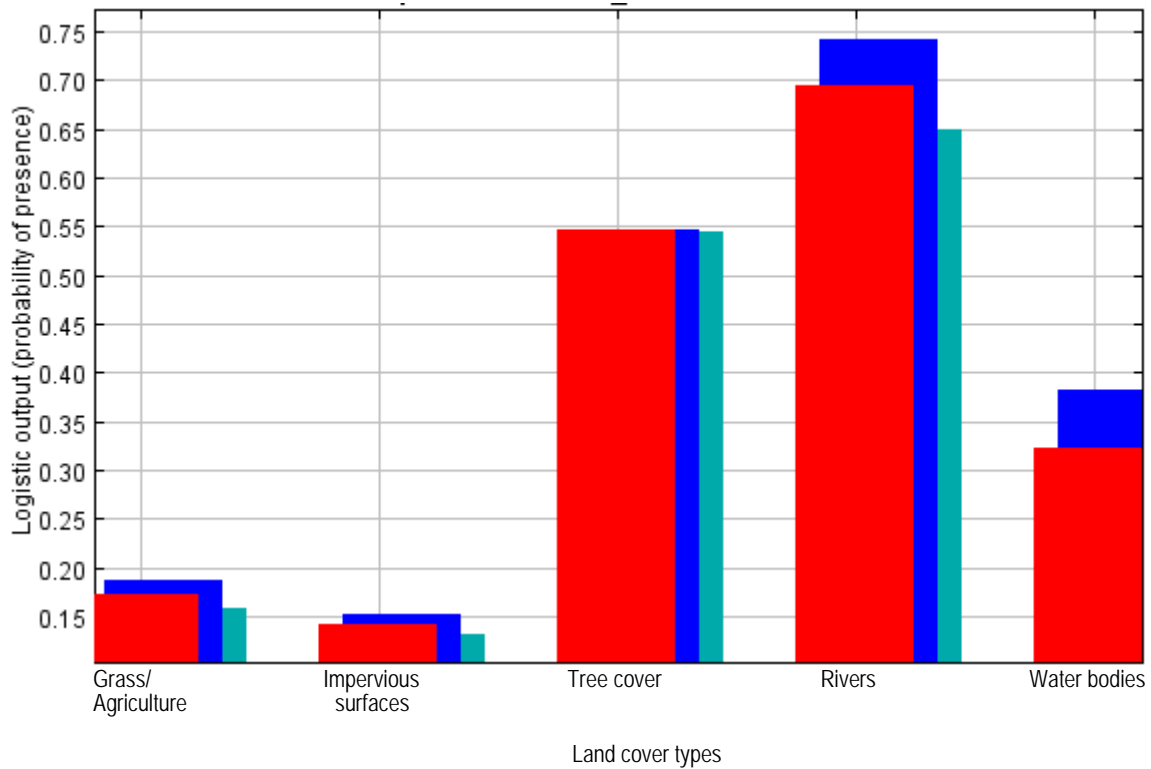
The NDVI, was then used as the base layer in creating the land-cover layer. In all, 107 regions of interest (ROIs) were defined in each of the five habitat types of impervious surfaces, trees, grass/agriculture, water and rivers. These ROIs were used as training data during supervised classification. Supervised classification was undertaken using the maximum likelihood function, where, in each pixel, is given a probability that it belongs to a particular class and then assigned to the class with the highest probability (ITT Visual Information Solutions 2010a). The resulting output is a ascii layer that can be converted and viewed in ArcGIS 10 (Environmental Systems Research Institute 2010)

References

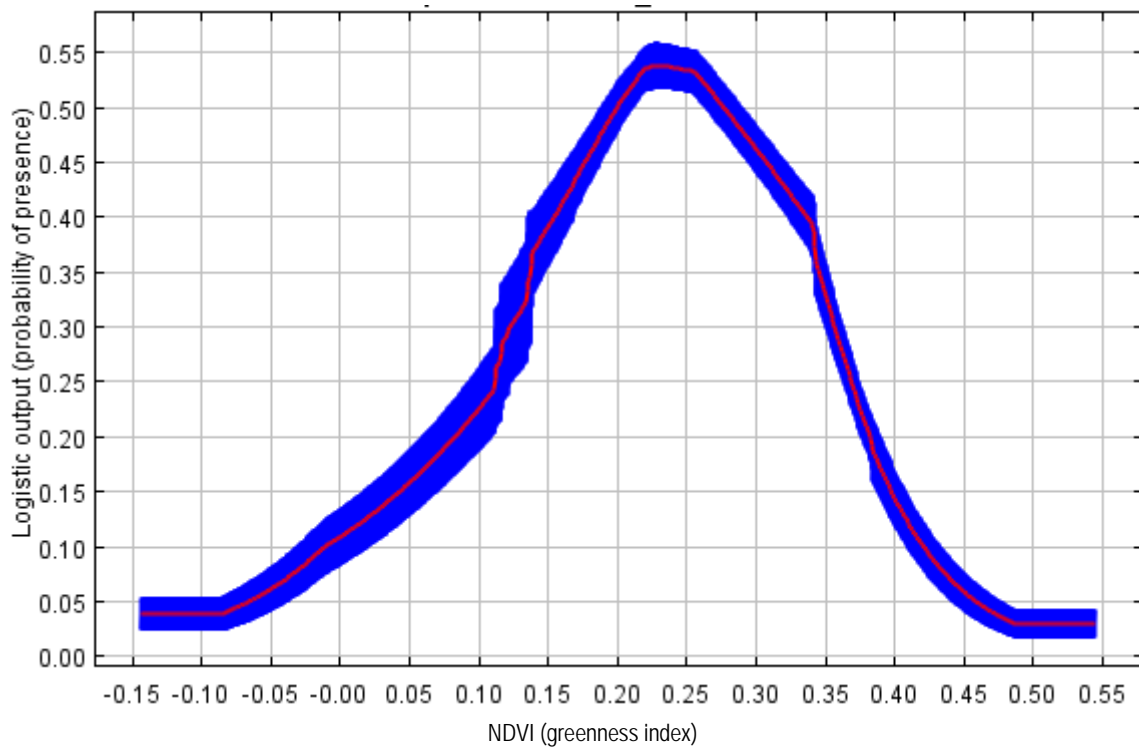
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Fig. S2. Response curves for final powerful owl species distribution modelling (SDM) (a–d) Red represents the mean response of the variable over the 20 replicate runs in Maxent. Blue represents the mean response of the variable over the 20 replicate runs \pm one standard deviation (categorical variables contain two shades of blue).

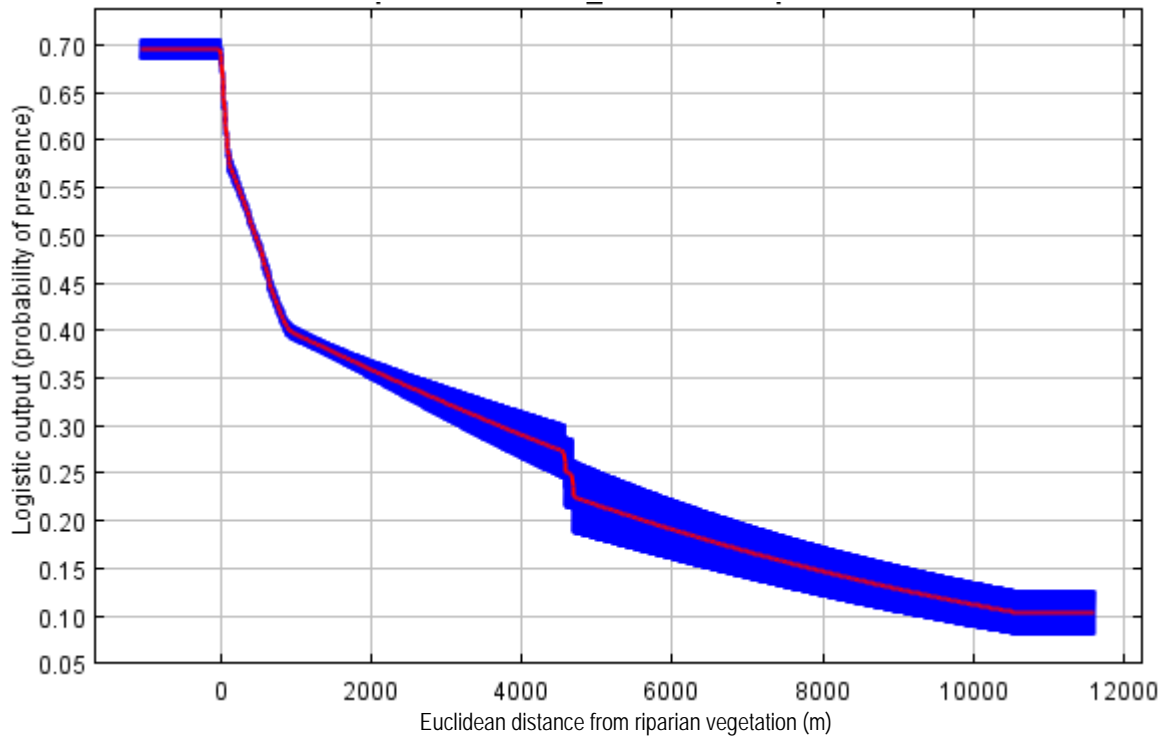
a.)



b.)



c.)



d.)

