

Maxent modelling for habitat suitability of vulnerable tree *Dalbergia latifolia* in Nepal

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Dalbergia latifolia Roxb., commonly known as rosewood, is one of the highly valuable tropical timber species of Nepal. The tree species was widely distributed in the past, however, overexploitation of natural habitat, deforestation, forest conversion for agriculture, illegal logging and the invasion of alien species resulted in the classification of this species as vulnerable by the IUCN (International Union for Conservation of Nature) category. So, the prediction of habitat suitability and potential distribution of the species is required to develop restoration mechanisms and conservation interventions. In this study, we modelled the suitable habitat of *D. latifolia* over the entire possible range of Nepal using a Maxent model. We compiled 23 environmental variables (19 bioclimatic, 3 topographic and a vegetative layer), however, only 12 least correlated variables along with 43 spatially representative presence locations were retained for model prediction. We used a receiver operating characteristic (ROC) curve to assess the model's performance and a Jackknife procedure to evaluate the relative importance of predictor variables. The model was statistically significant with an area under the curve (AUC) value of 0.969. The internal Jackknife test indicated that elevation was the most important variable for the model prediction with 71.3% contribution followed by mean temperature of driest quarter (9.8%). The most (>0.6) suitable habitat for the *D. latifolia* was 235 484 hectares with large sections of area in two provinces whereas, the western most provinces were not suitable for *D. latifolia* as per Maxent model. The information presented here can provide a framework for nature conservation planning, monitoring and habitat management of this rare and endangered species.

Keywords: rosewood, satal; distribution mapping; environmental variables; Maxent modelling