Habitat suitability and distribution range modelling for slender-billed vulture *Gyps tenuirostris* in Arunachal Pradesh, North East India using MaxEnt

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Determination of distribution range with the suitability of available habitat is one of the important facets for conservation planning on any threatened species. The slender-billed vulture (SBV) *Gyps tenuirostris* is one of the three critically endangered *Gyps* vultures found in Arunachal Pradesh, North East India. Maximum Entropy (MaxEnt) software was used to predict potential distribution range, habitat suitability and influence of environmental variables on the distribution of SBV. Analysis showed that out of the total area of 81658.85 km^2, 95.88 km^2 (0.12%) fell in the 'extremely suitable area' category. The prediction from MaxEnt was highly accurate, with a statistical AUC value of 0.994. The predicted preferred habitat of SBV includes areas with low elevation, high temperature, high precipitation, and open land with less vegetation cover. Elevation (63%) was found to have the most significant influence on the distribution of SBV. The findings of the present study will help in the implementation of any conservation initiatives required in the future with respect to SBV population protection or habitat conservation in Arunachal Pradesh.

Keywords: Conservation, distribution range, *Gyps tenuirostris*, habitat prediction, maximum entropy.

early 1990s and 2007 (ref. 6). Due to such rapid population decline, in 2000, it was listed as 'Critically Endangered', the highest endangered category according to International Union for Conservation of Nature[7].

Arunachal Pradesh (AP) is the largest state in North East India and lies in the Eastern Himalaya global biodiversity hotspot. It is uniquely located in the transition zone between the Himalayan and Indo-Burmese biogeographical regions[8]. However, there has been limited research on wildlife and particularly on vultures in the state, due to the mountainous terrain, vast undiscovered natural vegetation, steep elevational gradient, unpredictable weather conditions and poor road accessibility. SBV has been previously reported from AP most of it being the result of mere sighting records done along with bird diversity studies in the state[9–14].

The habitat of an organism is the combination of the space it inhabits and all eco-factors in that space, including the abiotic environment and other organisms necessary for the existence of individuals or groups[15]. This means any two habitats of the same species would have similar characteristics. By this logic, with the help of observed occurrence points of SBV, its suitable habitats in unknown