



POSTER

Guiding survey efforts for the critically endangered Himalayan Quail *Ophrysia superciliosa* using environmental niche modelling and proxy species

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The Himalayan Quail *Ophrysia superciliosa* is extremely rare and classified as Critically Endangered according to the IUCN Red List. Previous search efforts in and around the Indian localities of Mussoorie and Nainital (historical specimen record collection localities) have failed to detect the species. The most recent calculations estimate that the species went extinct in the 1980s. We calculate a new likelihood of extinction (Optimal Linear Estimation date of extinction = 2023) using additional records from a new database and while wide confidence intervals preclude us from declaring extinction for certain, it is likely that based on available records ($n=34$) the species will become extinct if not imminently then in the near future. As a precautionary principle it is necessary to increase and better target our immediate search efforts to avoid premature declarations of extinction. Normally, a species' habitat preferences as seen through an environmental niche model can act as a guide for survey efforts. However, it has been 137 years since the last reliable specimen record was collected and intensive habitat modifications have since occurred in those localities. As a result, it is unlikely that the current land cover in the locations of the historical specimen records reflect Himalayan Quail habitat preferences. Thus, the temporal mismatch between specimen data and covariates makes it impossible to generate a full environmental niche model for the Quail. To circumvent this, we investigate the use of two proxy species, Cheer Pheasant *Catreus wallechi* and Himalayan Monal *Lophophorus impejanus*, that taken together are thought to have habitat requirements that encapsulate those of the Quail. First, we create climate and topography models for the Quail (area = 9734 km²) and the two proxy species: Cheer Pheasant (area = 104 228 km²) and Himalayan Monal (area = 1262 249 km²). We find that the climate and topography models for the proxy species have moderate to poor overlap with the Himalayan Quail as measured by Spearman rank (Cheer Pheasant $r^2 = 0.66$; Himalayan Monal $r^2 = 0.72$) and Cohen's kappa (Cheer Pheasant kappa = 0.12; Himalayan Monal kappa = 0.43). We create full environmental niche models for the proxy species incorporating land cover and overlay these models with the Quail climate model to identify suitable areas for surveys (area = 4232 km²). We refine these suitable areas further using a measure of search effort to identify localities with suitable habitat and low search effort (area = 923 km²). Our results suggest the area surrounding Mussoorie as a potential target and that search efforts in western Nepal would be better directed over the border in India.