How well do we know Himalayan Galliformes species' range size?

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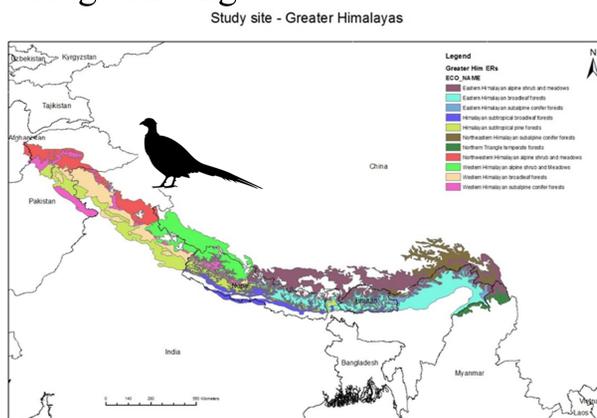
Introduction and Objective

- Geographic ranges are a fundamental part of ecology and species conservation.
- Range size plays a prominent role in categorizing species according to their short-term likelihood of extinction, including listing on the IUCN Red List of threatened species (Gaston et al., 2009).
- Our knowledge of species distributions is generated from field records of individual taxa.
- I develop a framework for testing the efficiency of our sampling of species' ranges.

Area Accumulation Curve : Modelling

- Area accumulation curve for each species was generated by arranging historical records in chronological orders.
- Minimum convex polygon (MCP) area was plotted as a function of year and as a function of count for number of records.
- A simulated accumulation curve was generated by performing 1000 iterations in which the historical records were added in a random order.
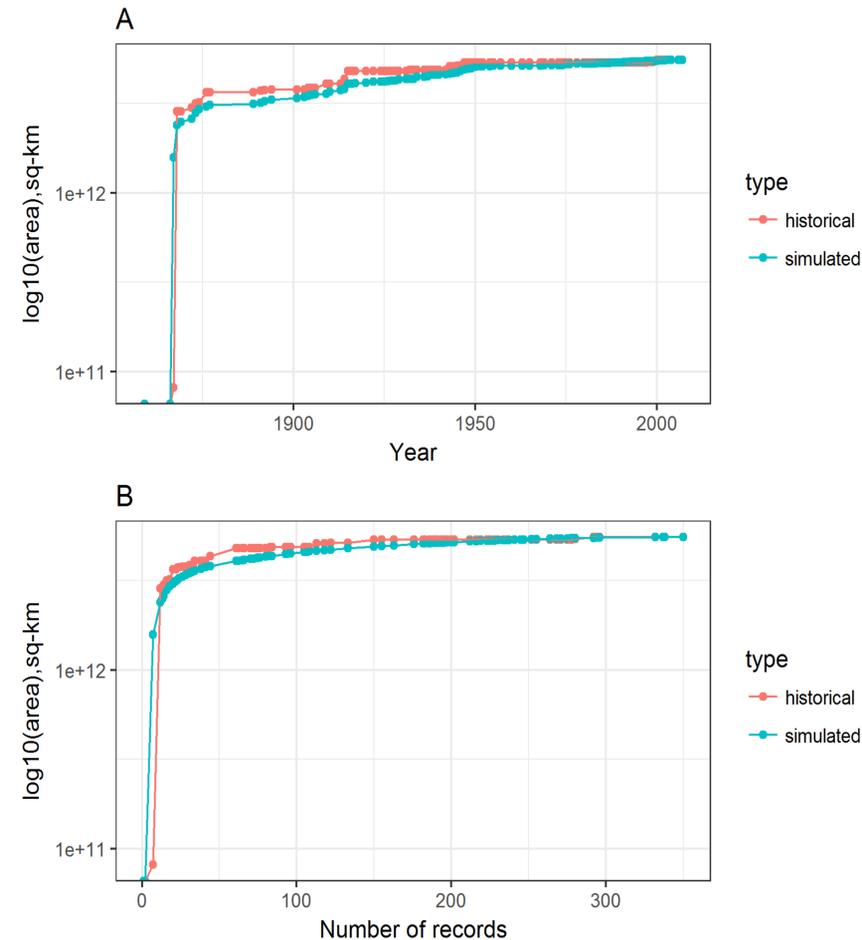- Both curve's asymptote were the compared.

Analysis

- To assess how complete our knowledge of species' ranges is, I tested whether my historical and simulated accumulation curves had reached an asymptote.
- A series of GLMM and other statistical tests were performed to test the knowledge on range..

Figure 1: Range of *Pavo cristatus* (common peafowl) A, Comparison of historical (red) and simulated (green) area accumulation curves for year. B, Comparison of historical (red) and simulated (green) area accumulation curves for number of records.

Results

- Survey efforts of my suite of species and thus the sampling is good.
- Knowledge of range size of my suite of species is quite good.
- Range knowledge for majority of species has improved significantly more rapidly than at random through time.
- Range size estimates made after 1970 were significant more likely to be larger than those made before.

Discussion

- To my knowledge, this is the first attempt to evaluate the survey's effort across the species range.
- Knowledge on geographic range is built up non- randomly and has provided a tool to assess the robustness of geographic range size estimates.
- An important tool for use in assessing the conservation status of species and demonstrates the limits to the general utility of spatial data.

Figure 2. *Pavo cristatus* (Common peafowl)

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