

Novel Spatial Methods For Predicting Centers Of Endemism Of Andean Birds

Hernandez, Pilar, Lily Paniagua, Aldo Soto, Jennifer Swenson, Carolina Tovar, and Bruce Young.
NatureServe, Arlington, VA, USA.

(PH, LP, JS, BY), Centro de Datos para la Conservación de Perú, Universidad Nacional Agraria
La Molina, Lima, Peru (AS, CT).

Abstract:

Conservationists often target centers of endemism for land protection because of the opportunity to protect many range restricted species at once. However, the information and methods used to identify these centers are often incomplete or biased, leading to inaccurate estimates of where they occur. Spatial models that better reflect underlying factors causing aggregations of endemic species are beneficial by eliminating these errors. We developed novel predictive models of endemism centers for a dataset of the distributions of 87 bird species restricted to the eastern slope of the Andes in Peru and Bolivia. The regression models are based not only on contemporary environmental variables, but also on historical factors that may have influenced speciation events. Most historical factors, such as dispersal barriers, are difficult to represent spatially, so we derived predictor layers to act as surrogates. To reduce bias caused by unevenly distributed collecting, we predicted distributions of the target species using a dataset of 2200 localities where the species have been recorded. The resulting maps, generated by relating indices of endemism to spatially derived predictor variables, more objectively identify centers of endemism and provide useful guidance to conservation initiatives in this region.