

ABSTRACTS FOR *CONDOR* 103(3) AUGUST 2001

FEATURE ARTICLES

PREDICTING SPECIES' GEOGRAPHIC DISTRIBUTIONS BASED ON ECOLOGICAL NICHE MODELING

A. TOWNSEND PETERSON¹

Natural History Museum, The University of Kansas, Lawrence, Kansas 66045

Manuscript received 20 January 2000; accepted 26 February 2001.

¹E-mail: town@ukans.edu

Abstract. Recent developments in geographic information systems and their application to conservation biology open doors to exciting new synthetic analyses. Exploration of these possibilities, however, is limited by the quality of information available: most biodiversity data are incomplete and characterized by biased sampling. Inferential procedures that provide robust and reliable predictions of species' geographic distributions thus become critical to biodiversity analyses. In this contribution, models of species' ecological niches are developed using an artificial-intelligence algorithm, and projected onto geography to predict species' distributions. To test the validity of this approach, I used North American Breeding Bird Survey data, with large sample sizes for many species. I omitted randomly selected states from model building, and tested models using the omitted states. For the 34 species tested, all predictions were highly statistically significant (all $P < 0.001$), indicating excellent predictive ability. This inferential capacity opens doors to many synthetic analyses based on primary point occurrence data.

Key words: ecological niche, GIS, geographic distribution, GARP

[Back to *CONDOR* 103\(3\) AUGUST 2001 Table of Contents](#)