Writing the Abstract

General Guidelines:

- A Single Paragraph
- 150-250 Words
- Everything Important in Your Paper Should Be Mentioned
- Highlight Your New Technique, Observation or Data
- Must Stand Alone
- Follows a General Formula

Can you find the: (1) Rationale, (2) Hypothesis/Objectives, (3) Methods, (4) Results and (5) Conclusions?

Expanding northward: influence of climate change, forest connectivity, and population processes on a threatened species' range shift

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Abstract

Species' ranges are dynamic, shifting in response to a large number of interrelated ecological and anthropogenic processes. Climate change is thought to be one of the most influential drivers of range shifts, but the effects of other confounded ecological processes are often ignored even though these processes may modify expected range responses to climate change. To determine the relative effects of climate, forest availability, connectivity, and biotic processes such as immigration and establishment, we examine range changes occurring in a species of bird, the Hooded Warbler (*Wilsonia citrina*). We focus predominantly on the periphery of the species' northern range in Canada but we also examine data from the entire species' range. Nesting records in southern Ontario were obtained from two breeding bird Atlases of Ontario separated by a period of 20 years (1981–1985 and 2001–2005), and the rate of range expansion was estimated by comparing the number of occupied areas in each Atlas. Twelve hypotheses of the relationship between the rate of range expansion and factors known to influence range change were examined using model-selection techniques and a mixed modeling approach (zero-inflated Poisson's regression). Cooler temperatures were positively related to a lack of range expansion indicating that climate constrained the species' distribution. Establishment probability (based on the number of occupied, neighboring Atlas squares) and immigration from populations to the south (estimated using independent data from the North American Breeding Bird Survey) were also important predictors of range expansion. These biotic process variables can mask the effects of forest availability and connectivity on range expansion. Expansion due to climate change may be slower in fragmented systems, but the rate of expansion will be influenced largely by biotic processes such as proximity to neighboring populations.