



Patuxent Wildlife Research Center
Science Brief for Resource Managers

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Science Brief PWRC 2003-45

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Sexual selection affects local extinction and turnover in bird communities

Description:

Identification of factors influencing local a global extinction probabilities is an important focus of conservation biology. Recent research has associated sexual dimorphism (specifically dichromatism) with life history traits associated with high extinction probabilities. Teams from Patuxent Wildlife Research Center and University of Paris, CNRS, collaborated on a study of the linkage between sexual dichromatism in birds and local extinction probability. The study used data from the North American Breeding Bird Survey and community-dynamic estimation methods developed by Patuxent researchers. The researchers found strong evidence that bird species in which males and females differ in color indeed have higher (23% higher) local extinction probabilities than monochromatic birds. Dichromatism was also associated with high rates of local turnover, emphasizing the increased role of dispersal in these species.

Progress to Date:

Primary manuscript describing analysis: Doherty, P F., Jr., G. Sorci, J.A. Royle, J.E. Hines, J.D. Nichols, and T. Boulinier. 2003. Sexual selection affects local extinction and turnover in bird communities. Proc. Natl. Acad. Sci. (in press, due for release April 6)

Methodological papers:

Boulinier, T., J.D. Nichols, J.R. Sauer, J.E. Hines, and K.H. Pollock. 1998. Estimating species richness: the importance of heterogeneity in species detectability. *Ecology* 79:1018-1028.

Nichols, J.D., T. Boulinier, J.E. Hines, K.H. Pollock, and J.R. Sauer. 1998. Estimating rates of local extinction, colonization and turnover in animal communities. *Ecol. Appl.* 8:1213-1225.

Nichols, J.D., T. Boulinier, J.E. Hines, K.H. Pollock, and J.R. Sauer. 1998. Inference methods for spatial variation in species richness and community composition when not all species are detected. *Cons. Biol.* 12:1390-1398.

Papers on forest fragmentation and bird communities:

Boulinier, T., J.D. Nichols, J.E. Hines, J.R. Sauer, C.H. Flather, and K.H. Pollock. 1998. Higher temporal variability of forest breeding bird communities in fragmented landscapes. *Proceedings of the National Academy of Sciences, U.S.A.* 95:7497-7501.

Boulinier, T., J.D. Nichols, J.E. Hines, J.R. Sauer, C.H. Flather, and K.H. Pollock. 2001. Forest fragmentation and bird community dynamics: inference at regional scales. *Ecology* 82:1159-1169.



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Management Implications:

As predicted by theory, dichromatism and other results of sexual selection should be considered as potentially important factors influencing vulnerability of bird species to local and even global extinction. The higher local extinction rates and the increased importance of dispersal suggest that land use changes resulting in habitat fragmentation may be especially important for the conservation of dichromatic species.

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