

Quantifying vulnerability of quaking aspen woodlands and associated bird communities to global climate change in the northern Great Basin

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Quaking aspen populations are declining in much of the west due to altered fire regimes, competition with conifers, herbivory, drought, disease, and insect outbreaks. Aspen stands typically support higher bird biodiversity and abundance than surrounding habitat types, and maintaining current distribution and abundance of several bird species in the northern Great Basin is likely tied to the persistence of aspen in the landscape. This project will examine the effects of climate change on aspen and associated bird communities by coupling empirical models of avian-habitat relationships with landscape simulations of vegetation community and disturbance dynamics under various climate change scenarios. Field data on avian abundance, stand age structure, and other vegetation characteristics will be combined with existing spatial data sets. Key questions that will be addressed include: (1) what is the current successional, structural, and spatial distribution of aspen on the landscape, and how do these factors affect abundance of bird species; (2) how have aspen stand condition and distribution, and avian abundance and distribution, been shaped by disturbance, e.g., grazing and fire; (3) how is global climate change likely to affect aspen condition and distribution, and what are the implications for avian species; and (4) how are today's management strategies, or adaptive adjustments to those strategies, likely to affect long-term risks and persistence of aspen and associated avian communities.

Key science products to be produced include reports and articles in peer-reviewed journals that describe the bird-habitat, aspen projection, and bird-aspen projection models; maps and spatial data layers associated with each model; presentations of results to land management agencies and at scientific meetings; and metadata associated with each of the above products. Results will reflect interactions between management decisions (e.g., prescribed fire) and climate change, and will be directly relevant to regional landscapes and to management agencies and conservation organizations. Co-Principal Investigators are Dr. Pete Weisberg and Dr. Jian Yang, University of Nevada-Reno. Partner agencies and organizations include the U.S. Forest Service, U.S. Fish and Wildlife Service, The Nature Conservancy, Nevada Division of Wildlife, The Aspen Delineation Project, Great Basin Bird Observatory, and The High Desert Ecological Research Institute.

