

Pacific Southwest Research Station

Sierra Nevada Research Center

Development and Evaluation of Tools for Monitoring Ecosystem and Species Diversity across Landscapes

The Research:

Information on the condition of populations and habitats of plants and animals is a primary tool for determining the status of progress toward maintaining or achieving desired conditions for ecosystem and species diversity across National Forest System lands. The development and implementation of Forest-scale monitoring as part of Land and Resource Management Plans has been challenging and progress has been slow. Two barriers appear consistent: 1) lack of clear monitoring objectives in terms that can be readily translated into sampling design specifications; and 2) lack of capacity or commitment to fund data collection, management. A consistent, nationally standardized monitoring program to obtain status and change data on species of concern and interest and ecosystem diversity on National Forest System (NFS) lands would greatly assist Regions and Forests in achieving monitoring objectives.

Objectives:

- To develop and evaluate sampling designs, detection methods, and analysis procedures to efficiently obtain trend data on populations of multiple vertebrate species and their habitats at ecoregional scales.
- To demonstrate techniques to empirically derive indicators of ecosystem diversity.
- To develop national guidance in the form of a NFS technical guide that outlines a protocol on how to monitor populations and habitats of multiple species in one integrated design.
- To provide technical advise on development and implementation of protocols and analysis techniques.



Photo: Lori Campbell



Our Mission:

Sierra Nevada Ecosystems are complex and our knowledge of them is incomplete. As a result, the long term outcome of any given land and resource management strategy is uncertain. We will provide assistance to land managers and policy makers by addressing this management dilemma through targeted research, emphasizing an integrated, ecoregional approach to examine particular physical, ecological, and socio-economic issues, across a range of appropriate spatial and temporal scales specific to each issue.

This unit will represent the collective research expertise and interests of scientists located in Fresno, Davis and Albany as well as other scientists within the Pacific Southwest Research Station. With a full spectrum of research, from long-term, fundamental research to short-term, tactical applications, this Center is intended to support conservation, restoration, and sustainable utilization of the lands within the Sierra Nevada ecoregion.



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Application of Research Results:

Monitoring is required of land management agencies to assess the success of management activities in meeting legal, regulatory, and policy objectives, including sustaining populations of native and desired non-native species. A monitoring protocol that can efficiently and simultaneously obtain population and habitat data on a moderate number and variety of management indicator species is greatly needed by the National Forest System (NFS). Guidance on tools and techniques for data collection and analysis will help National Forests, Regions and the Forest Service accomplish its monitoring objectives.

Location:

The project is national in scale; testing and evaluation has been conducted in the Sierra Nevada in California.

Publications:

Manley, P. N., B. Van Horne, M. M. McKenzie, J. K. Roth, W. J. Zielinski, F. W. Weckerly, T. J. Weller, and C. Vojta. 2006. Multiple Species Inventory and Monitoring protocol: a technical guide for monitoring animals and plants. General Technical Report PSW-GTR-73, U.S. Department of Agriculture, Forest Service, Washington, D.C., USA.

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Holthausen, R, R. Czaplewski, D. DeLorenzo, G. Hayward, W. Kessler, P. N. Manley, K. McKelvey, D. S. Powell, L. Ruggiero, M. Schwartz, B. Van Horne, and C. Vojta. 2005. Strategies for Monitoring Terrestrial Animals and Habitats. General Technical Report. GTR-RMRS-161. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fort Collins, Colorado, USA.

Manley, P. N., W. J. Zielinski, M. D. Schlesinger, and S. R. Mori. 2004. Evaluation of a multiple-species approach to monitoring species and ecosystem conditions at the ecoregional scale. *Ecological Applications* 14(1):296-310.

Roth, J.K., P.N. Manley, M.M. McKenzie, M.D. Schlesinger. 2004. Multiple-species Inventory and Monitoring 2002 Monitoring Report. Unpublished report; U.S. Forest Service, Lake Tahoe Basin Management Unit, South Lake Tahoe, CA. 187 pp.



Photo: Ted Thayer

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