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Habitat Relationships of Landbirds in the Northern Region, USDA Forest Service

Richard L. Hutto
Jock S. Young



Abstract

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A series of first-generation habitat-relationships models for 83 bird species were detected in a 3-year study on point counts conducted in association with the USDA Forest Service's Northern Region Landbird Monitoring Program. The models depict probabilities of detection for each of the bird species on 100-m-radius, 10-minute point counts conducted across a series of major vegetation cover types. Based on these models, some bird species appear to be restricted in their habitat distribution to: (1) postfire, standing-dead forests, (2) relatively uncut, older forests, (3) harvested forest types, (4) marshes, (5) riparian environments, and (6) grasslands and sagebrush. Such restricted distributions highlight the need to provide adequate amounts of these cover types to maintain viable species populations. Many bird species were relatively abundant in harvested forests, suggesting a need for nesting success studies because timber harvesting creates unnatural cover types that may elicit settling responses by species that are "programmed" to respond to similar naturally occurring cover types. Thus, these unnatural cover types could be acting as "ecological traps," where species are being attracted to sites where suitability is relatively poor.

These preliminary results demonstrate the utility of a landbird monitoring program, and suggest that agencies such as the Forest Service should consider broadening the indicator species concept to monitor groups of species (such as landbirds and butterflies) that can be easily sampled with a single field method. The list of species covered by this program is indeed large enough and ecologically broad enough to help managers predict and monitor the effects of management activities on almost all the major vegetation types in the region. The detail and region-specific nature of this information can be matched by no other database in existence on landbirds, and the information should prove useful to land managers in planning areas that might consist of alternative cover types.

Keywords: bird-habitat associations, ecological trap, fire effects, indicator species, logging effects, monitoring, Northern Rocky Mountains, point count, riparian

The Authors

Richard L. Hutto is a Professor of biology and wildlife biology in the Division of Biological Sciences at the University of Montana. He holds a B.A. degree in zoology from the University of California, Los Angeles, an M.S. degree in biology from Northern Arizona University, and a Ph.D. degree in biology from the University of California, Los Angeles. He has been working with the Northern Region of the USDA Forest Service on the development and implementation of a landbird monitoring program since 1990. Phone: 406-243-4292, and e-mail at hutto@selway.umt.edu

Jock S. Young is a Research Assistant in the Division of Biological Sciences at the University of Montana. He holds a B.S. degree in zoology from Oregon State University, an M.A. degree in ecology from the University of California, San Diego, and an M.S. degree in biology from the University of Montana. He has worked on the landbird monitoring program in different capacities since 1993, and as a data analyst since 1996.

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Habitat Relationships of Landbirds in the Northern Region, USDA Forest Service

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Jock S. Young

Introduction

In 1993, the Northern Region of the USDA Forest Service initiated a regionwide landbird monitoring program so that managers might better understand the habitat relationships of landbirds that breed in the Northern Rocky Mountains and, in the future, might be able to assess longer-term landbird population trends. The program was initiated to help the Forest Service meet its legal mandate (National Forest Management Act of 1976) to monitor populations of "indicator" species as a mechanism to maintain viable populations of native vertebrates. Landbirds are a good indicator species "survey group" (Hutto 1998) because they are highly visible and many species can be surveyed simultaneously.

Maintaining the integrity of ecosystems will probably involve maintaining major vegetation cover types in "natural" amounts and distributions across a landscape. Therefore, the first step in the landbird monitoring program was to establish an objective and quantitative description of the distributions of bird species across the major vegetation types in the Northern Region. Although published bird field guides contain a rough idea of habitat associations, they do not provide quantitative information on differences in the probabilities of occurrence among vegetation types, especially the vegetation types created through timber harvesting and occupying large extents of landscape. Thus, we established a series of broadly distributed bird survey points throughout the region in an attempt to sample each major vegetation cover type adequately for the models.

This publication (1) describes the overall design and field methods involved with the habitat relationships part of the Northern Region Landbird Monitoring Program, and (2) presents preliminary results of habitat relationships based on field surveys conducted between 1994 and 1996, the initial years of full-scale data collection at permanently marked points.

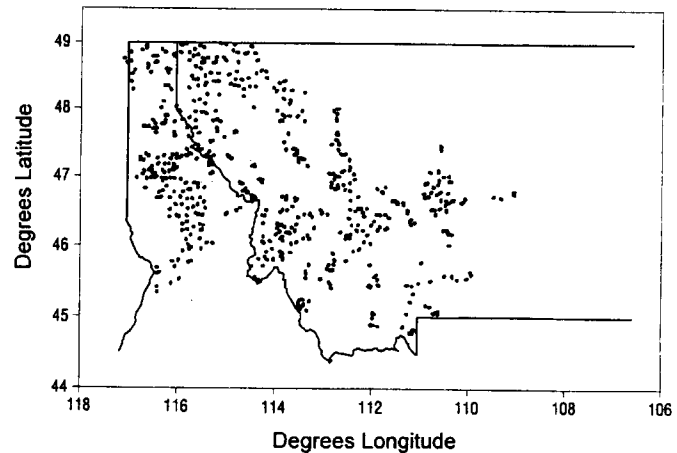


Figure 1—The distribution of permanent landbird monitoring transects in northern Idaho and western Montana.

Methods

Overall Design

Sample points were distributed across all 13 National Forests in the Northern Region. Data from the Custer National Forest, however, were confined to the Little Missouri National Grasslands of North Dakota and involved a different assemblage of species in largely nonforested cover types, so these data are not included here. A total of 566 10-point transects were geographically stratified by 7.5-minute topographic quadrangle maps throughout the non-wilderness lands of the other 12 National Forests (fig. 1) and were permanently marked in the field in 1994 as part of this long-term monitoring effort. Each point was sampled once during each breeding season in three consecutive years (1994 to 1996), with a small number of changes in transect locations between years, as discussed in the results. Plans are to continue sampling about half of these points every