

Summary of:

The Influence of Forest Management Practises on Boreal Forest  
Bird Habitat Use and Productivity: A Community Approach 1994/95 Annual Report  
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Prince Albert Model Forest Annual Report for 1994/95  
The Influence of Forest Management Practices on Boreal Forest Bird Habitat Use and  
Productivity: A Community Approach.

ABSTRACT

The southern Boreal Mixedwood zone of Canada's prairie provinces hosts the greatest diversity of breeding birds anywhere in North America and birds represent over 70% of the vertebrate biodiversity of the boreal forest. The primary objectives of this study are to 1) provide habitat associations of boreal forest birds according to major stand types and ages and 2) to provide information on how forest fragmentation influences the use of habitats by birds and their subsequent productivity. The rationale for this approach is to provide critical biological information on the importance of various successional stages within the boreal mixedwood and secondly, to make recommendations of how to improve cutting ground rules to mitigate the impact on birds breeding in remaining forest blocks. Bird-habitat associations were established along a successional gradient ranging from young aspen to spruce-dominated stands. Using the multivariate statistical techniques of TWINSpan, PCA, and DCCA, we determined 5 distinct bird communities that typified these successional stages. In addition, we provide relative abundance data for several species that can now be used in predictive modelling of agglomerative habitat-supply models for forestry purposes. The impacts of forest fragmentation on breeding bird communities was assessed using transects of artificial nests containing quail and plasticine eggs. Regular mistnetting was continued at 2 contiguous forest sites within PANP and 363 individuals representing 27 species were uniquely banded. 43% of all captures were dominated by Ovenbirds and American Redstarts and these are recommended as focal species for long-term monitoring. 41 individuals banded in 1993 were recaptured on their same breeding sites in 1994. Forest interior in contiguous and logged landscapes did not differ in predation rate (45.5 and 46.2%, respectively) but forest edges in the logged landscape had higher predation (65.3%) than interior forest. Farm woodlots suffered the highest predation rate of all site types (78.8% edge and 78.5% of interior nests) but we detected no edge effect. We detected no difference in predation rate on ground versus shrub nests. Photographs suggested that red squirrels were the dominant predator in all land-uses. Overall, fragmentation due to agriculture seems to have a far greater impact on nest predation in the Boreal forest than does logging. This difference is due, in part, to commensurate and permanent changes in the predator community.

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the use of habitats by birds and their subsequent productivity. The rationale for this approach is to provide critical biological information on the importance of various successional stages within the boreal mixedwood and secondly, to make recommendations of how to improve cutting ground rules to mitigate the impact on birds breeding in remaining forest blocks. Bird-habitat associations were established along a successional gradient ranging from young aspen to spruce-dominated stands and have been summarized previously. This report concentrates on the impacts of forest fragmentation on breeding bird communities and summarizes the results of stand type on use of forests by several species of bats, a new initiative that was integrated into the boreal forest bird program for 1995 only. We assessed patterns of predation using transects of artificial nests containing quail and plasticine eggs. Forest interior in contiguous and logged landscapes did not differ in predation rate (45.5 and 46.2%, respectively) but forest edges in the logged landscape had higher predation (65.3%) than interior forest. Farm Woodlots suffered the higher predation rate of all site types (78.8% edge and 78.5% of interior nests) but we detected no edge effect. We detected no difference in predation rate on ground versus shrub nests. Photographs suggested that red squirrels were the dominant predator in all land-uses. Overall, fragmentation due to agriculture seems to have a far greater impact on nest predation in the Boreal forest than does logging. This difference is due, in part, to commensurate and permanent changes in the predator community. We found little brown (*Myotis lucifugus*), northern long-eared (*Myotis septentrionalis*), big brown (*Eptesicus fuscus*) and hoary (*Lasiurus cinereus*) in the PAMF. The mean number of bats in mature mixedwood forest was significantly higher than in mature pine or aspen forest. This study highlights the importance of mature mixedwood forest to boreal forest bat populations, a finding consistent with our earlier findings for boreal forest bird communities.

## The Influence of Landscape Fragmentation on Dynamics of Nest Predation

### ABSTRACT

Nest predation is a major factor influencing the reproductive success of many passerine species. To that end, we attempted to determine what factors in the boreal forest of Saskatchewan are influencing the reproductive success of boreal forest songbirds. Specifically, we examined 1) whether forest type (e.g., coniferous, deciduous and mixedwood forest) influenced the frequency of nest predation; 2) how habitat fragmentation caused by logging and agriculture influences the frequency of nest predation relative to predation in contiguous forest. This was done using artificial nests containing quail and plasticine eggs. The remains of plasticine eggs and remotely triggered cameras were used to determine what species of predator were responsible for destroying nests. Surveys recording calls and sightings were used to estimate the relative abundance of predators such as corvids and red squirrels (*Tamiasciurus hudsonicus*) while live trapping was used to determine the abundance of small mammals. The rate of nest predation was based on the total number of nests destroyed over a 12 day period at each site. Predation was significantly higher in coniferous forest (67% of 320 nests) than in deciduous (17% of 320 nests) or mixedwood forest (25% of 320 nests). The higher rate of predation observed in coniferous forest was caused by higher densities of red squirrels and the presence of fishers (*Martes pennanti*) at two of the three coniferous sites. In addition, differences in vegetative structure between the different forest types may have had an influence on predation rate. The percentage of nests destroyed at logged edge (49% of 360 nests), logged interior (40% of 360 nests) and contiguous forest (40% of 464 nests) was significantly lower than at farm edge (67% of 296 nests) or farm interior (67% of 296 nests). Farm woodlots suffered higher predation due to a greater diversity of predators at the edge, and high densities of red squirrels in the interior. Logged edges

and logged interior suffered similar rates of predation compared to the contiguous forest. However, nests at logged sites were more likely to be destroyed by gray jays (*Perisoreus canadensis*) while nests in contiguous forest were more likely to be destroyed by red squirrels or mice.

## Habitat Use and Foraging by Bats in Prince Albert Model Forest

### Abstract

We looked at habitat use by bats (Chiroptera: Vespertilionidae) in the boreal forest during the summer of 1995. To examine habitat use by bats, we use the ANABAT detector system, which renders the echolocation calls of bats audible to humans and is specifically designed to facilitate the identification of free-flying microchiropteran bats. We set out to determine which species of bats are present in the Prince Albert Model Forest and how these species use mature mixed-wood, aspen (*Populus tremuloides*) and pine (*Pinus banksiana*) forest habitat. We found little brown (*Myotis lucifugus*), northern long-eared (*Myotis septentrionalis*), big-brown (*Eptesicus fuscus*) and hoary (*Lasiurus cinereus*) bats in the PAMF. The mean number of bats per night in mixed-wood forest was significantly higher than that of aspen and pine forests. We also used the BOREAS towers in aspen (OA) black spruce (*Picea mariana*: OBS) pine (OJP) to examine the vertical stratification of habitat use by bats. To examine the vertical stratification of habitat use we sampled for bats below, within, and above the forest canopy. There were significantly more *L. cinereus* flying above the canopy than below the canopy. The nightly temporal pattern of activity for all bats over all forest types in the boreal forest peaked at 90 minutes after sunset, which is later than other reported peak emergence times and is probably due to shorter periods of true night in the boreal forest. Our study highlights the importance of mature mixed-wood forest as habitat for bats and suggests that habitat above the canopy is an important component of forest habitat for bats in the boreal forest.