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## Habitat Relationships and Feeding Ecologies of Birds of Prey, Woodpeckers and Cone-Dependent Finches in the Western Newfoundland Model Forest

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### Background

Birds are the most highly visible and easily censused and studied wildlife components in forest ecosystems (Montevecchi 1993). There is a considerable research knowledge about avian habitat relationships in boreal forests elsewhere in Canada and in the Northern Hemisphere (e.g. Erskine 1977). However, little is known about the habitat relationships of birds in the boreal forests of insular Newfoundland (Montevecchi and Tuck 1987). The present research projects will increase understanding of the birds, their habitat utilizations and feeding ecologies in different aged forests in the Western Newfoundland Model Forest

Research projects are designed to determine avian biodiversity and abundance in natural and cut forests in the Western Newfoundland Model Forest. Specific studies are focused on avian assemblages, birds of prey and woodpeckers in natural and old second-growth forests, at precommercially thinned sites, in clear cuts, and at different forest classification sites (Meades and Moores 1989). Findings to date suggest that i) assemblages of woodpeckers (especially large three-toed ones) and aerial insectivores are more diverse and abundant in natural than in old second growth sites, and ii) assemblages of seed-eating finches and ground-feeding passerines are more diverse and abundant in old second growth sites than in natural sites (Hogan in prep.). A diverse group of diurnal and nocturnal birds of prey inhabit the Western Newfoundland Model Forest

### Research Studies

New studies were initiated with birds of prey and woodpeckers to determine i) appropriate methods of censusing these rare species, ii) the diversities and abundances of the species of these groups in natural

and in old second-growth forests, in precommercially thinned sites, in clear cut areas and in different forest classification sites, iii) feeding ecologies of the species in these groups, and iv) the spatial and temporal use of habitats by the species in these groups.

Based on the research initiatives of Dr. I. Thompson, comparisons will be made with between avian assemblages in old second-growth forests and in natural forest sites in the Little Grand Lake area and elsewhere in the Western Newfoundland Model Forest. Building on the provincial nongame wildlife initiatives of J. Brazil much attention is being focused on birds of prey.

### Objectives

These research projects are designed to produce data analyses and models of habitat utilization by birds in the Western Newfoundland Model Forest. These data and models will be integrated into larger scale Geographic Information Systems (GIS) landscape models of spatial and temporal patterns of habitat utilization by wildlife. Models will be used to predict avian community structures in different forest habitats and classification sites. Special attention will be paid to rare species, such as hawks, owls and woodpeckers with the aim of identifying indicator species for different forest habitats (e.g. Forsman *et al.* 1977; Conner and Rudolph 1993).

All studies will investigate trophic relationships (e.g. woodpeckers and insect fauna, raptors and small mammals) and their interactions with habitat and the dynamics of habitat change and modification by forestry practices. Efforts will be made to initiate some studies of the distributions, abundances and feeding ecologies of birds in winter. Boreal finches, whose populations have

declined in recent decades and that are dependent on cone crops for which they may compete with introduced Red Squirrels (Montevocchi *et al.* in prep.), are especially attractive in that it will be possible to investigate the dynamic interactions of avian, mammalian and insect seed-eaters, forest changes and forestry practices.

### Methods

Avian census techniques utilized a point-count method (IPA; Downes and Welsh 1993) which involves five 10-min counts within study sites of homogeneous habitat. Count-sites are located 200 m apart and at least 100 m from the edges of study sites. The methods were modified and incorporated vocalization and pecking broadcasts of woodpeckers and diurnal raptors (see Mosher *et al.* 1990). Other areas in different forest types within the WNMF were surveyed with and without broadcasts from late May through late August 1993.

Vegetation and habitat classifications were carried out under the supervision of I. Thompson at 40 sites, including 10 uncut sites, 22 second-growth forests and 4 precommercially thinned sites. The vegetation measures were species of trees, small trees and saplings, species composition height, diameter at breast height, snags, deadwood-density, 4 layers of ground-cover - species composition of shrubs, mosses, flowering plants, lichens), plant density, abiotics (rocks, litter, slash, soil), coarse woody debris (logs, stumps), canopy, foliage height diversity, Forest Ecological Classification sites (Meades and Moores 1989).

Small mammals were censused with mark-recapture methods, and techniques for measuring insect diversity and abundance were developed. Census methods for both small mammals and insects will be modified and integrated with those of other ongoing research projects in the WNMF.

### Anticipated Results

The species diversity and abundance of hawks, woodpeckers and owls will be determined, as their spatial and temporal patterns of habitat use. The feeding ecologies of all major species will be investigated. Long-term basic research and monitoring studies will be developed, and in the

process 3 B.Sc. Honours Theses and 3 M.Sc. Theses (Biopsychology, Memorial University of Newfoundland) will be produced.

### Co-Investigators

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### Literature Cited

- Conner, R.N. and Rudolph, D.C. 1993. The role and value of Red-cockaded Woodpecker in the southern pine ecosystems. Paper presented at the Wilson Ornithological Society/Society of Canadian Ornithologists Annual Meeting (Guelph).
- Downes, C.M. and Welsh, D. 1993. An overview of bird monitoring in Canada. Paper presented at Wilson Ornithological Society/Society of Canadian Ornithologists Annual Meeting (Guelph).
- Forsman, E.D., Meslow, E.C. and Strub, M.J. 1977. Spotted Owls in young versus old-growth forests, Oregon. *Wildlife Society Bulletin* 5: 43-47.
- Hogan, H. In preparation. Avian assemblages in natural and old second growth forests in western Newfoundland. M.Sc. Thesis (Biopsychology) Memorial University of Newfoundland, St. John's.
- Meades, W.J. and Moores, L. 1989. *Forest Site Classification Manual: A Field Guide to the Damman Forest Types of Newfoundland*. Forestry Canada, St. John's.
- Montevocchi, W.A. 1993. Birds as bio-indicators in marine and terrestrial ecosystems. Pages 60 - 62 in J. Hall and M. Wadleigh (Eds.) *The Scientific Challenge of Our Changing Environment* Canadian Global Change Report Series No. 1R93-2.
- Montevocchi, W.A., Steele, D.H., Thompson, I.D. and West, R.J. In preparation. Crossbills, cones and squirrels: Newfoundland perspectives. *Trends in Evolution and Ecology*.

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Montevocchi, W.A. and Tuck, L.M. 1987.

*Newfoundland Birds: Exploitation, Study, Conservation.* Nuttall Ornithological Club, Cambridge, U.S.A.

Mosher, J.A., Fuller, M.R. and Kopeny, M. 1990.

Surveying wood land raptors by broadcast of conspecific vocalization. *Journal of Field Ornithology* 61: 453-461.