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AN ABSTRACT OF THE THESIS OF

___Daniel K. Rosenberg___ for the degree of ___Master of Science___
in ____Wildlife Science____ presented _____June 27, 1990_____.

Title: Characteristics Of Northern Flying Squirrel And Townsend's
Chipmunk Populations In Second- And Old-Growth Forests

Abstract approval:__Robert Anthony_____
                    Robert G. Anthony, Ph.D.

The forested landscape in western Oregon has become increasingly
dominated by young, second-growth forests (i.e., those regenerated
after clear-cutting of previously uncut forests) as a result of
intensive and extensive timber harvesting. There have been few
investigations on how wildlife populations respond to these forests.
This study compared population characteristics and habitat
relationships of 2 sciurids between second- and old-growth Douglas-fir
forests.

An important parameter in the characteristics of wildlife
populations is abundance, but estimation of abundance is a problem for
animals that are not easily captured. I applied various estimators
(enumeration, jackknife, moment methods) to data from northern flying
squirrel (Glaucomys sabrinus) populations that had low, heterogeneous
capture probabilities ($\bar{X} \approx 0.10$) and low densities (≈ 2 animals/ha).
The enumeration method (i.e., the number of individuals captured) would
have performed poorly because capture probabilities appeared to vary
spatially and temporally. The jackknife estimator-selection procedure
was sensitive to small changes with the data, and estimates did not
stabilize with time. Similarly, the moment estimator performed poorly
when there were <16 trapping occasions. Computer simulations confirmed
these results. Specifically, the first-order jackknife estimator
produced the most reliable results compared to the other estimators. I
used this estimator to determine abundance of northern flying squirrels
and Townsend's chipmunks (Eutamius townsendii) in second- and old-
growth forests.

Flying squirrels are one of the major prey species of the spotted owl (Strix occidentalis), a species that is listed as threatened under the Endangered Species Act. Estimated densities ranged from 1.1 - 3.3 squirrels/ha, and averaged 2.0 and 2.3 in second- and old-growth stands, respectively. Body mass and survivorship were also similar between stand-age class; however, there was a higher proportion of females in second-growth stands. The findings of similar densities of flying squirrels in these stand types are contrary to expected patterns of abundance and suggests that spotted owls select old-growth forests for reasons other than flying squirrel abundance. Flying squirrel densities were not correlated to the measured habitat variables, and models relating habitat characteristics at a particular trap station failed to predict squirrel occurrence.

Townsend's chipmunks comprise a major proportion of small-mammal biomass in the central Oregon Cascades, and therefore may be ecologically important. I examined differences of Townsend's chipmunk populations in second- and old-growth forests. Densities ranged from 0.4 to 10.3 chipmunks/ha, and averaged 2.6 and 5.2/ha in second- and old-growth stands, respectively. Chipmunk densities were positively correlated with density of large hard-snags, although this relationship was only true in old-growth stands. Chipmunks had smaller home ranges, a greater proportion of females, and a greater proportion of animals believed young-of-the-year in old- than in second-growth stands. Based on these differences, old-growth stands appeared to provide better habitat for Townsend's chipmunks than second-growth stands.

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