AN ABSTRACT OF THE THESIS OF

Dorothy Wilson for the degree of Master of Science in Fisheries and Wildlife. Title: Validating Songbird Habitat Relationship Models

Models are commonly used to assess and predict wildlife response to management practices. Model validation is essential if managers are to use them with confidence. Fifteen forest bird-habitat relationship models were developed by biologists using data collected from private forestland in southwest Washington. These models predict species' probability of occurring in a stand based on structural habitat variables, such as shrub cover and canopy height. In the spring/summer of 1998 and 1999, I collected data from private and Bureau of Land Management (BLM) forestland in the vicinity of Cottage Grove, Oregon to test or validate these models. Thus, I tested the models' ability to be generalized to a different time and place.

I used 3 approaches to test or validate the models: 1) accuracy of prediction; 2) trend analysis; and 3) variable coefficient comparisons. Four of the 15 models performed well in at least 2 of the 3 tests. Four of the models that performed well at predicting species occurrence also had a positive relationship between the probability of occurrence output from the model and species' abundance. However, this relationship was weak for species that had low detectabilities or low densities because of large territories. Models that performed well at predicting habitat also were more likely to have variable coefficients that were comparable between the Washington (WA) models and models I produced with the same variables using my data. Finally, because few of the models performed well, I created new models using my 1998 data and tested them with my 1999 data. These models generally performed better than the WA models; there were some similarities between variables, especially with the better performing WA models.

I tested whether point count duration effects bird abundance and/or presence/absence and, thus, model performance. Point count surveys were conducted along forest roads, so there was the additional concern that surveys conducted on roads were not representative of the stand. I tested to see if there was a difference in relative abundance or species' presence/absence for on and off road surveys. I found a difference

in abundance for most species between 5- and 8-minute point count surveys. Also, there were differences in presence/absence of species between the 2 counts, which had an affect on model performance. There was no difference in abundance of modeled species between on-road and off-road point count surveys except for the western tanager (*Piranga ludoviciana*), which was more abundant at on-road than off-road survey points. There were a few differences in presence/absence of species for on and off roads, but the differences in model performance were minimal.

The models that performed well may be used to make management decisions that will affect the landscape for years to come, and thus, their accuracy needs to be continually monitored and the models adjusted accordingly. The survey length for future monitoring efforts should be 8 minutes because presence/absence of species can be more accurately accessed with this longer survey length. Survey locations should accurately depict the entire habitat to which inferences are made.