Modeling Daily Nest Survival of Five Woodpecker Species in Relation to a Mountain Pine Beetle Epidemic Near Helena, MT

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Forested ecosystems of Western North America have experienced increased periodicity and severity of disturbances in recent years. Large-scale mountain pine beetle (*Dendroctonus ponderosae*) epidemics affecting hundreds of thousands of forested hectares in the American and Canadian Rockies have been attributed to favorable climatic conditions. Ecosystem processes of these forested landscapes are potentially becoming altered. Wildlife responses, however, to beetle disturbance are not yet well understood. Because of their sensitivity to changes in forest conditions, as well as their ability to create valuable habitat for several other forest-dwelling species, our study focused on woodpeckers as disturbance specialists. Owing to differences among life history characteristics, we grouped 5 focal woodpecker species into three assemblages based on feeding and habitat requirements and predicted responses to beetle epidemic conditions. Based on a *priori* hypotheses, we modeled daily nest survival (DSR) of each assemblage as a function of several temporal and spatial covariates, including remotely sensed data, abiotic factors, and beetle epidemic conditions at two spatial scales. To rank the support for each candidate model, we used Akaike's Information Criterion corrected for small sample size (AICc) and used the principle of parsimony to arrive at a final inferential model. Results suggest that abiotic weather and local habitat features were important to include in models of DSR, whereas a number of other covariates containing information about the timing and nature of the beetle epidemic were not useful. Our results will inform management activities for post-beetle forests that will help maintain habitat of disturbance specialist species.