Public Abstract

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Wildfire and mountain pine beetle infestations are naturally occurring events in western North American forests that benefit numerous wildlife species. Black-backed Woodpeckers are emblematic of the important role these natural events play in creating wildlife habitat, since they are almost completely restricted to recently killed forests. However, management practices aimed at reducing the economic impact of wildfire and mountain pine beetle infestations can result in habitat loss for this sensitive species. This dissertation evaluates the relative role of wildfire, prescribed fire, and mountain pine beetle infestations in contributing to population growth of Black-backed Woodpeckers in the Black Hills, South Dakota. I found that Black-backed Woodpecker populations, on average, increased in forests burned by summer wildfire, but decreased in mountain pine beetle infestations and forests treated with fall prescribed fire. I also found that Black-backed Woodpeckers occupying mountain pine beetle infestations required nearly four times the amount of habitat relative to forests burned by summer wildfire. I observed Black-backed Woodpeckers eating more of their preferred food in forests burned by summer wildfires, which may partially account for the differences in population growth rates and spatial requirements among habitats. By 3 years after forests were burned with summer wildfire, average population growth declined, food resources diminished, and woodpeckers were increasingly likely to move to new habitats. This suggests conservation strategies should focus on ensuring patches of 1-2 year post-summer wildfire forest are available for Black Backed Woodpeckers in the Black Hills, South Dakota.