

Rocky Mountain Research Station Science You Can Use *(in 5 minutes)*

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Birds & Burns: Can Prescribed Fires Limit Wildfire Severity While Maintaining Fire's Ecological Importance to Bird Species?

Wildfire influences wildlife habitat in ways that benefit some species while degrading habitat for others. Recent wildfire favors several woodpecker species by creating dead trees, or “snags,” that are easily excavated for nest cavities and also provide foraging substrate for bark and wood-boring beetles. Within a few years after wildfire, openings in the canopy often stimulate understory vegetation and improve opportunities for species that nest in shrubs or forage on the ground. Yet the same wildfire may reduce habitat for species that nest and forage in live trees. Prescribed fires also can shape bird habitat and diversity directly by changing forest structure and indirectly by modifying subsequent wildfire effects on habitat.



Vicki Saab, scientist emeritus and formerly a research wildlife biologist with the Rocky Mountain Research Station, led a research team examining how prescribed fires affected wildlife populations and habitat. “We wanted to know whether burn severity after wildfire would be lower in locations previously treated with prescribed fire,” she explains. “And do birds respond differently to recent wildfires in areas treated for fuels reduction compared to untreated areas?”

Wildfires create snags that woodpecker species like this black-backed woodpecker excavate for nest cavities and use to forage for bark beetles and wood-boring beetles. Courtesy photo by Tom Kogut.

In the early 2000s, Saab designed a study across the Interior West called the Birds and Burns Network to quantify bird responses to prescribed fire. When the 2007 East Zone Complex Fire burned through some of the network plots on the Payette National Forest in Idaho, the team expanded the analysis beyond prescribed fire effects on bird habitat to include wildfire effects.

Bird Responses to Burn Severity

The study confirmed that the prescribed fires limited wildfire burn severity, but the reduction in burn severity didn't change patterns of bird responses to wildfire. Species that normally move into burned areas and those that move away from burned areas were the same whether or not the site was treated with prescribed fire.

Quresh Latif is a member of the research team and a biometrician with the Bird Conservancy of the Rockies, an organization that generates science to advance bird conservation. He says birds responded similarly to burn severity across treated and untreated burn sites.

“Even though prescribed fire limited the severity of subsequent wildfire, the species that favored and avoided severely burned areas were similar regardless of whether the area had or had not been previously treated by prescribed fire,” says Latif.

Spring Burns and Breeding Season

One of the big concerns for managers is the timing of spring prescribed burns, which often coincide and potentially interfere with the breeding season of many bird species. Saab says they found no negative

short-term (within 2 years) effects of low-severity prescribed fire on bird occupancy.

“Birds might shift away in the first year after the prescribed fire, but they’re coming back to those areas,” says Saab. “It’s a potential short-term loss for what could be a long-term gain in limiting the extent and severity of subsequent wildfires.”

Saab cautions that the prescribed fires implemented in their study were low severity compared to other similar studies, which have found stronger relationships between prescribed burns and bird population dynamics. She suggests future studies should focus on a range of treatment types, severities, and sizes to inform management for conservation of bird diversity.

KEY MANAGEMENT CONSIDERATIONS

- Prescribed fires, in this study, were of low severity and had minimal effects on occupancy by bird species.
- Prescribed fires mitigated severity of subsequent wildfires, but wildfire effects on bird species’ occupancy of sites were similar regardless of whether or not the site received prescribed fire treatment.
- Wildfire affected bird occupancy of sites largely depending on life history traits. Woodpecker species, secondary cavity-nesting species, and understory-foraging species showed positive effects, while species that depended on live trees for nesting and foraging experienced negative effects.
- Results suggest managers can employ prescribed fire to reduce fire severity without necessarily altering the ecological importance of wildfire to birds.



Sequence of photos showing the same plot on the Payette National Forest: in 2003 before prescribed treatment, in 2006 after a prescribed fire, and in 2008 after the plot was burned during the 2007 East Zone Complex Fire. USDA Forest Service photo by Vicki Saab

FEATURED SCIENTISTS

Vicki Saab is scientist emeritus after a more than 30-year career as a research wildlife biologist with the RMRS. Her research focused on understanding wildlife habitat relationships with large-scale disturbances of fire, bark beetles, and forest management, to provide guidance on management activities that promote wildlife population and habitat persistence.

Jonathan Dudley is an ecologist with the RMRS whose research focuses on understanding long-term effects of management activities on populations and habitats of birds, with an emphasis on cavity-nesting species.

Quresh Latif is a research ecologist with [Bird Conservancy of the Rockies](#). His research focuses on population and community responses to disturbance and studies how sampling and models interact to determine ecological inference, habitat selection in animals, and ecological models to inform conservation and management.

FURTHER READING

Latif, Q.S.; Saab, V.A.; Dudley, J.G. 2021. [Prescribed fire limits wildfire severity without altering ecological importance for birds](#). Fire Ecology. 17(1):37. doi: 10.1186/s42408-021-00123-2

Saab, Victoria A.; R. Latif, Quresh; Block, William M.; Dudley, Jonathan G. 2022. [Short-term benefits of prescribed fire to bird communities of dry forests](#). Fire Ecology. 18: 4.

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