

# How a tiny migratory owl can teach us about the changing role of fire in the American West

By Scott Yanco (PhD candidate, University of Colorado Denver)

As most Coloradans know, wildfires in western North America have been changing in character and frequency. Recent fires such as High Park, Waldo, Fourmile Canyon, and Hayman are examples. The changes in fire regimes across the West arise in part because of past management practices that allowed combustible fuels to accumulate (Covington and Moore 1994, Fulé et al. 2014). Acting in concert with a warming climate, this process leads to fires that burn larger areas at higher severity (Brown and Shepperd 2001, Westerling et al. 2006).

Within Colorado's mid- and low-elevation montane forests, these shifting patterns modify habitats that, ironically, depend on fire – just a different kind of fire. Historically, these forests experienced frequent fires (Brown and Shepperd 2001) that were relatively mild in intensity, typically burning along the ground and leaving mature trees unscathed (Covington and Moore 1994, Sherriff et al. 2014). Now, instead of low-severity burns leading to old-growth stands, these fires are consuming large swaths of montane forest, sometimes killing nearly 100 percent of canopy trees and leaving behind landscapes that bear little resemblance to the mature pine forests that once dominated the region (Fulé et al. 2014).

While there are many factors to consider surrounding changing fire regimes, one important consideration is the effect that such changes may have on the animal inhabitants of montane forests, particularly those strongly adapted to the mature forests previously maintained by historical fire regimes. One such species, the Flammulated Owl (*Psiloscopus flammeolus*), is a U.S. Forest Service "Sensitive Species" and a U.S. Fish and Wildlife Service "Species of Special Concern" that shows strong preference for older forests (Linkhart et al. 1998, Linkhart and Reynolds 2006).

Now the forest types that this species prefers are at risk of loss to changing fire regimes. For example, after the Hayman Fire in 2002, radio-tracked owls established breeding home ranges in areas of unburned or low-severity burned forest, avoiding the stands that experienced the highest severity fire (Yanco and Linkhart 2018). This casts doubt on whether our future forests will be able to support the continued presence of species adapted to life in these formerly fire-maintained habitats.

Despite what we learned after the Hayman Fire, questions remain about how this sensitive species responds to fire. Specifically, we don't know how the owls' prey species (moths) respond to fire, how distribution of nesting cavities changes after fire, or how the owls' decisions about which habitats to use are influenced by fire.

## Field Trips

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meet early Saturday for breakfast or join the group later on Saturday morning. Lodging recommendations and additional trip information will be sent to registrants.

### **Chico Basin Ranch Sunday, May 27**

**6:00 AM - 6:00 PM**

Mark Amershek

Email: [mamershek@msn.com](mailto:mamershek@msn.com)

Phone: 303-329-8646

Trail Difficulty: Moderate

Maximum Participants: 15

*Chico Basin Ranch is a working cattle ranch located in El Paso/Pueblo counties southeast of Colorado Springs. We will bird along the ranch roads with stops on level open areas such as ponds, wetlands, and grasslands.*

### **Chatfield State Park - Marina Sandspit Sunday, May 27**

**7:30 AM - 12:00 PM**

Gregg Goodrich

Email: [GreggGoodrich@gmail.com](mailto:GreggGoodrich@gmail.com)

Phone: 303-655-9135

Trail Difficulty: Easy

Maximum Participants: 12

*We will bird all the standard Chatfield State Park birding locations on the Douglas County side beginning at the Sandspit. Shore birds, lake birds, land birds, and late migrants are all possible.*

## *FIRE, continued from page 9*

A new and ongoing study, generously supported by the Denver Field Ornithologists, provides a unique opportunity to explore these questions. The Rio Grande National Forest is planning a prescribed burn of the Hot Creek Research Natural Area (RNA), a relatively undisturbed landscape of ponderosa pine uplands bisected by canyons forested by quaking aspen, white fir, and blue spruce. Land managers use prescribed fires to reduce fuel loads, simultaneously reducing the risk of future high-severity fires and restoring a historically typical disturbance regime to the ecosystem.



Flammulated Owl  
Photo credit: Scott Yanco

To date, our research has collected movement data on more than a dozen owls in the Hot Creek RNA over two seasons preceding the fire. We have also run blacklight moth traps to assess populations of the owls' prey and have located and characterized hundreds of cavity-bearing trees representing potentially suitable nesting habitat. We have also begun quantifying the composition and structure of the pre-fire forests used by the owls. This dataset will serve as baseline information to which we can compare post-fire results after the prescribed burn, which is anticipated to take place in 2018. Specifically, we will consider how the owls' movement patterns and habitat preferences are affected by fire and whether the available prey and/or nesting habitat influence the decisions they make.

This project is a collaboration among many organizations, including Colorado College, University of Colorado Denver, Rio Grande

National Forest, and The Smithsonian Institution's Migratory Connectivity Project. On top of the important questions our study seeks to address, projects like this also serve as vital educational venues, creating opportunities for numerous undergraduate students to gain valuable experience participating in academic research. We have also used the project as a platform for outreach to land managers in Colorado to learn about the ecological implications of fire, including the beneficial role that fire can play. Despite the importance of addressing these questions and providing this platform for education and outreach, financial support for projects like this is increasingly difficult to acquire. This reality highlights the role that groups such as DFO play in maintaining efforts to better understand the avifauna of Colorado and the unique and dynamic ecosystems they inhabit.

### Literature Cited

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