

## **A Case Study Assessing the Use of Fire as a Conservation Tool for Bighorn Sheep Habitat in Western Colorado**

**BENJAMIN R. WILSON,<sup>1</sup>** *Natural Resource Ecology Laboratory, Colorado State University, Fort Collins, CO 80523, USA*

**MADELINE GRANT-HOFFMAN,** *Bureau of Land Management 2815 H Road, Grand Junction, CO 81506, USA*

**STEPHANIE DUCKETT,** *Colorado Division of Parks and Wildlife, 711 Independent Avenue, Grand Junction, CO 81505, USA*

**ABSTRACT** We evaluated the efficacy of using woodland fire to alter vegetation composition in a manner that augments desert bighorn sheep (*Ovis canadensis nelsonii*) habitat in the Black Ridge Canyons Wilderness Area in western Colorado. We applied generalized linear mixed models to estimate pre-fire ewe habitat selection and then simulated a hypothetical widespread fire to spatially predict where fire would be most beneficial in expanding habitat. We found that ewes were avoiding habitats with high woodland stand density, which is the habitat most likely to be removed by fire. Given the removal of all woodlands, it is likely that habitat expansion would occur in areas near topographic escape terrain. Coupled with this analysis, we addressed concerns regarding potential negative effects of fire in this system by comparing vegetation composition of unburned habitats to burned habitats that were treated with a native seed mixture. We found that foliar cover in burned habitats was on average 2 times greater than in unburned habitats and that post-fire seeding likely allowed for these differences to be proportionally similar between native and non-native grass species. Our results provide an encompassing view of the effects of fire for a common management situation in which both land and wildlife values are of mutual interest.

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**KEY WORDS** *Bromus tectorum*, cheat grass, fire management, habitat quality, *Ovis canadensis nelsonii*, piñon juniper woodlands, resource selection.

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<sup>1</sup> E-mail: ben.wilson@colostate.edu