Pronghorn Antelope Short-Term Response to a Dormant-Season Wildfire in a High-Elevation Steppe Rangeland

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Introduction
Fire is a natural ecological process on rangelands and can alter distribution of free-roaming livestock and wildlife. The post-fire mechanism that alters distribution of these animals is through a series of negative and positive feedbacks associated with forage and browse quality and quantity. In the case of animals being drawn to recently burned areas, the mechanism is the positive attraction to the palatable and high-quality forage and browse that regenerates after fires. While studies reporting positive attraction of cattle, big game, and other large wildlife species are well reported, there is less information in the published literature about native browsing species such as pronghorn antelope (Antilocapra americana). Researchers with the U.S. Department of Agriculture (USDA) Agricultural Research Service reported in 2015 that antelope were attracted to spring burned areas in the shortgrass steppe of Colorado, especially in winter. In the Colorado study, antelope density was 26 times greater in winter and seven times greater in spring. This fire–antelope interaction, however, has not been quantified in higher and colder steppe environments such as the mixed-grass prairie of southeast Wyoming.

Objectives
Our objective was to quantify short-term response of antelope to a burned area in southeastern Wyoming.

Materials and Methods
A wildfire burned February 17, 2017, approximately five miles west of Laramie. The fire burned on both sides of Highway 130, but the majority (>95%) burned on the south side of the highway on Laramie Research and Extension Center (LREC) property. We used direct visual counting in driving surveys of antelope in the approximate 80-acre burned area on LREC property and the surrounding unburned areas consisting of ~800 ac. Counting was initiated April 7, 2017, or 49 days after

Figure 1. Antelope in the burned area April 12, 2017, just shy of two months following the fire.

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the fire and relative to the beginning of spring-like weather and active plant growth. Surveys were conducted on the following dates: April 7, 11, 15, 19, 25, and 28; May 7, 12, 16, and 30; and June 5, 12. The 12 surveys were conducted to determine pronghorn attraction and occupancy of the burned and unburned areas. The burned and unburned areas assessed in this study were dominated by greasewood (*Sarcobatus vermiculatus*), inland saltgrass (*Distichlis spicata*), and alkali sacaton (*Sporobolus airoides*) with a minor component of western wheatgrass (*Pascopyrum smithii*) and blue grama (*Bouteloua gracilis*).

**Results and Discussion**
Antelope were observed actively grazing/browsing in the burned area early in the study (Fig. 1). The proportion of antelope in the burned area relative to the total number of antelope observed was greater the first seven sampling dates and lower the last four sampling dates (Fig. 2). This greater proportion of antelope in the burned area suggests an early level of attraction during early spring, but a diminishing attraction in early summer (Fig. 3). When stratified by early and late, antelope use was significantly higher early and significantly lower later (Fig. 4). Thus, burned areas known to attract cattle may also attract native species such as ungulates.

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**Figure 2.** Proportion of antelope in the burned area relative to the total number of antelope observed was greater initially, but then declined as spring progressed into summer.

**Figure 3.** Attraction to the burned area relative to time-since-fire was higher during early spring, and diminished into summer.

**Figure 4.** When stratified by early and late, antelope use was significantly higher early and significantly lower later.