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Controls over the strength and timing of fire-grazer interactions in a semi-arid rangeland.

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INTRODUCTION

Given a choice, grazing animals prefer forage on recently burned rather than unburned areas. The relationship between fire and grazing pressure may be different where grass production is high (tallgrass) as compared to lower productivity semi-arid rangelands. In these drier areas, precipitation may be more influential on livestock grazing behavior and result in a less clear-cut relationship between fire and grazing.

LOCATION

This study was located in north-eastern Colorado with an average of 13 inches of rain each year on a site with deep sandy loam soils. Blue grama (*Bouteloua gracilis*) and buffalograss (*Buchloe dactyloides*) made up over 80% of the vegetation.

METHODS

Of three square pastures, one fourth of each was burned in rotation each fall for four years so that each pasture was entirely burned during the course of the study. Location of cattle fitted with GPS collars was determined at 5 minute intervals to determine how much time was spent on burned and unburned areas of the pasture. Topography of the pasture was also quantified to determine if it influenced grazing distribution. Cattle weight gain was also measured.

RESULTS

Over all years and pastures, cattle spent 31.4% of their grazing time on the 25% of the pasture that had been burned. Where cattle rested was not related to burned areas. Cattle spent less time in areas more distant from water sources. During dry periods, neither burning or topography affected grazing distribution. In 3 of the 4 years of study, burning 25% of a pasture had no influence on cattle weight gains. In 1 of the 4 years, burning 25% of a pasture increase cattle weight gain by 10%.

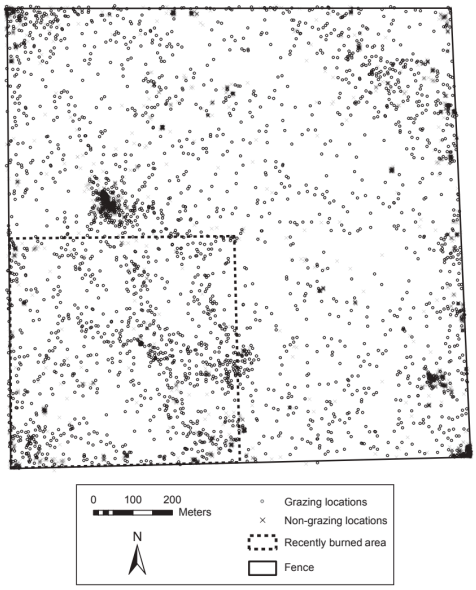

Figure 1. Distribution of GPS locations for a yearling steer collected at 5-min intervals from 16 May to 10 June 2009. The dense cluster just north of the burned area is the location of the water source.

Original publication:
Augustine, D.J. and J.D. Derner. 2014. Controls over the strength and timing of fire-grazer interactions in a semi-arid rangeland. Journal of Applied Ecology 51:242-250.