

Effect of Prescribed Fire on Recruitment of *Juniperus* and *Opuntia* in a Semiarid Grassland Watershed¹

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Introduction

The Bernalillo Watershed Protection Project was begun in 1953 following catastrophic erosion and flooding of small communities below. Although erosion control features and protection from grazing successfully increased grass cover and stabilized watershed soils, the expansion of juniper woodland (*Juniperus monosperma*) into the grassland watershed prompted concern that gains in watershed stability could be reversed. In 1995, fire was reintroduced into the grassland as a means of maintaining perennial grass cover and preventing further expansion of the juniper woodland community.

Methods

Burns were conducted on randomized 1 ha plots during November of 1995 and January of 1998. Juniper and *Opuntia* plants were censused in February of 2002. We counted all juniper plants occurring on treatment plots and measured height and crown diameter to the nearest decimeter.

Results

Burned plots had significantly fewer live juniper and significantly more dead juniper (*table 1*). Average size of living juniper on burned plots was greater, indicating a reduction in juniper recruitment.

Table 1—Mean number and size of juniper occurring on burned and unburned plots.

	Live juniper/plot	Dead juniper/ plot	Height (m)	Diameter (m)
Burned	7.25 a	5.0 a	1.70 a	2.14 a
Unburned	22.75 b	0.5 b	1.35 b	1.55 b
P value	<0.0005	<0.0005	0.0463	0.0445

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The three species of *Opuntia* found on the Bernalillo watershed—*O. phaeacantha*, *O. imbricata*, and *O. clavata*—were censused using belt transects. Patch area of *O. phaeacantha* and *O. clavata* patches was calculated using two perpendicular diameter measurements (cm). Both height and crown diameter were measured for cholla (*O. imbricata*). The mean number of cholla plants was significantly lower in burned plots, averaging 6 plants per plot as compared with 31 plants per plot in unburned areas. In addition, control plots averaged three patches of *O. clavata* per plot compared with zero in burned plots. The average number of *O. phaeacantha* patches was approximately equal for burned and control plots, averaging 131 and 138, respectively. However, patch size for *O. phaeacantha* was significantly reduced on burned plots (fig. 1). These data support the use of prescribed fire in reducing woody vegetation while maintaining cover of perennial grasses.

Opuntia phaeacantha

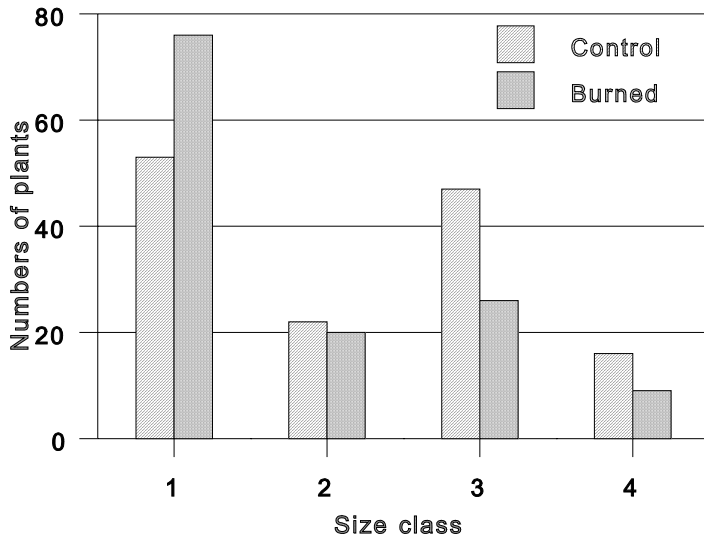


Figure 1—Size class distribution of *Opuntia phaeacantha* plants occurring on control and burned plots.