

Assessing aspen regeneration in East-Central Arizona

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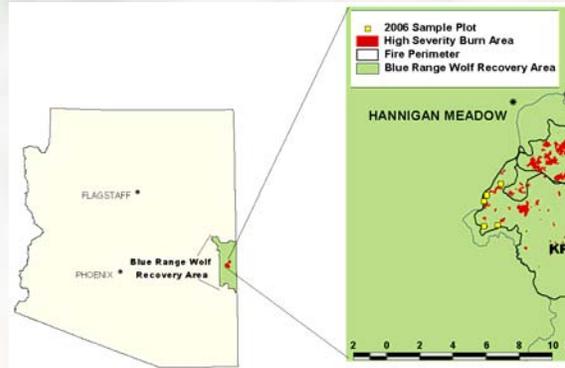


Introduction

Quaking aspen (*Populus tremuloides*) is not regenerating sufficiently after disturbance across most of Arizona. Elk (*Cervus elaphus*) herbivory has been implicated as a cause for the failure of regeneration after disturbance. In 2003 and 2004 within the Mexican Gray Wolf (*Canis lupus baileyi*) reintroduction area, a series of wildfires burned \approx 33,275 acres in the Blue Range Primitive Area, mostly in aspen and mixed conifer stands. In addition, cattle have been removed from this fire complex to allow for site recovery. This study site provides an opportunity to study the response of aspen to large-scale disturbance in the presence of elk and wolves. Studies in Yellowstone National Park show that wolf presence has altered elk feeding patterns. In order to assess the impacts elk browse may be having on aspen regeneration in this area, aspen suckers in the KP Fire were measured.

Methods

- High severity burned aspen stands were identified using fire severity maps.
- Five high severity burned aspen stands were randomly selected and sampled.
- Response variables included suckers per hectare, mean sucker height, and % suckers browsed.
- One-way analysis of variance (ANOVA) was used to compare suckers per hectare, % suckers browsed, and the square root of sucker height across sampled stands.



Will wolves alter the feeding patterns of elk?

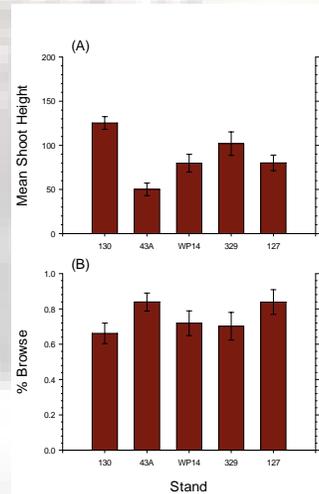


Figure 1. Comparison of (A) mean sucker height and (B) browse frequency for five high-severity burned aspen stands sampled within the KP Fire perimeter in the Blue Range Wolf Recovery Area in eastern Arizona. Bars represent mean \pm SEM.

Results

- There was a significant difference in mean stand sucker height ($F = 7.15$, $n = 16$, $P < 0.001$), which ranged from 50 to 125 cm (see Figure 1).
- There was not a significant difference in browse frequency ($F = 1.43$, $n = 16$, $P = 0.23$) (see Figure 1).
- No significant difference in suckers per hectare ($F = 2.02$, $n = 16$, $P = 0.10$) was found, with an overall sucker density sampled of 81,805 suckers per hectare (SE = 8,001.5).

Conclusions

- Some aspen clones burned in stand replacing fire within the KP fire are experiencing rapid height growth (Figure 1, Stand 130).
- Our browse measure, frequency of suckers browsed, was not sensitive enough to reflect browse intensity on single stems.
- Browse, although intense in some areas, has not retarded height growth throughout burn.

Implications

- An additional measure of bushiness or number of forks may provide valuable information on interactions.
- This study site will allow us to look for further relationships between aspen regeneration and site conditions, elk browse and wolf presence.
- Areas of high and low wolf use within our study site are being identified utilizing U.S. Fish and Wildlife wolf tracking data, for use in the 2007 field season.

Acknowledgements

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