



Ecological Restoration Institute



Fact Sheet: *Herbaceous Vegetation Responses Six Years After Restoration Treatments* October 2012

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By Michael Stoddard

Introduction

Altered forest structure and functional processes have led to many critical conservation problems in southwestern ponderosa pine ecosystems, including the loss of native biological diversity, declining herbaceous productivity and increased frequency of large, high-severity wildfires. Ecological restoration treatments involving thinning trees and reducing surface fuels through prescribed burning have proven effective in reducing fire severity. Disturbances associated with restoration treatments have the potential to enhance native biological diversity and herbaceous production. These disturbances can also have the unintended consequences of promoting the establishment of non-native species. In spite of the widespread use of these treatments, there is little understanding of the long-term persistence of both native and non-native herbaceous species following restoration treatments.

Recent research (Stoddard et al. 2011) examined the differences in native and non-native understory population in a southwestern ponderosa pine forest that 1) has been treated using low, medium and high levels of thinning young trees to emulate historical forest patterns followed by one prescribed fire and 2) where fires had been excluded for more than a century and where no restoration treatments had been implemented (typical of today's forest conditions).

Research Findings

- Native plant cover was generally greatest in treatments that involved thinning the most trees.
- Native species richness was consistently higher in treated stands (regardless of thinning intensity) than in untreated stands.
- Plant community composition was still in flux by the sixth year after treatment.
- Immediately after treatment, non-native species comprised 6% of the total cover where treatment-induced disturbances were the greatest, through was reduced by half six years after treatment.



Forest floor is thick with debris and lacking in understory plants in this pre-treatment photo from 1998.



In one year post-treatment (2000), the foreground is dominated by non-native forbs.

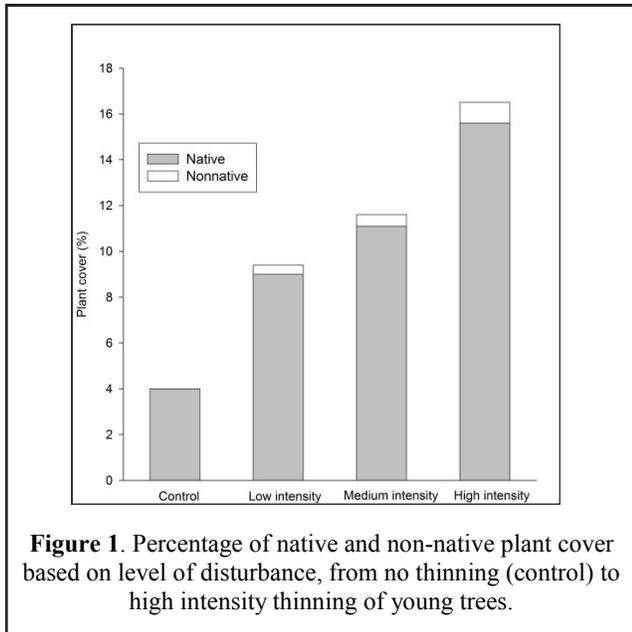


Six years after treatment (2006), the understory is dominated by native grasses.

The Ecological Restoration Institute is dedicated to the restoration of fire-adapted forests and woodlands. ERI provides services that support the social and economic vitality of communities that depend on forests and the natural resources and ecosystem services they provide. Our efforts focus on science-based research of ecological and socio-economic issues related to restoration as well as support for on-the-ground treatments, outreach and education.

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Management Implications



- Disturbances associated with restoration treatments can facilitate the establishment of non-native plants; however, the post-treatment plant community was dominated by native species (Figure 1).
- Understory responses take several years to develop and vary depending on climate, severity of treatment disturbances and past history of the site.
- Since plant community changes occur slowly in semiarid climates of the Southwest, long-term monitoring programs are essential to evaluate whether observed trends in the post-treatment understory are successional or persistent changes.

References

Moore, M.M., C.A Casey, J.D. Bakker, J.D. Springer, P.Z Fulé, W.W. Covington, and D.C Laughlin. 2006. Herbaceous vegetation responses (1992–2004) to restoration treatments in a ponderosa pine forest. *Rangeland Ecology and Management* 59:135-144.

This Fact Sheet summarizes information from the following publication:

Stoddard, M.T., C.M. McGlone, P.Z. Fulé, D.C. Laughlin, M.L. Daniels. 2011. Native plants dominate understory vegetation following ponderosa pine forest restoration treatments. *Western Northern American Naturalist* 71:206-214. <http://library.eri.nau.edu/gsd/collect/erilibra/index/assoc/HASHe68a.dir/doc.pdf>

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