Acknowledgements: The authors gratefully acknowledge the support of the Lower Thompson Creek, Applegate Valley, southwest Oregon.

Lessons learned after 10 years of fuel-reduction and monitoring in woodlands/chaparral of the Lower Thompson creek, Applegate valley, southwest Oregon

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Abstract

The woodland chaparral of Lower Thompson Creek is a mosaic of mixed coniferous, deciduous, and sagebrush communities. Oak and whiteleaf manzanita are the dominant woody species. The objective of fuel-reduction treatments in this area is to create a fire-safe environment that reduces the risk of catastrophic wildfire.

Objective: reduce fuel & restore historic vegetation composition and structure

Many oak woodland stands of the Applegate valley show distinct age classes. Older oak stands are often surrounded by a younger cohort of oak or shrubs. Such stand structures incorporating a dominant flame-resistant material and fuel layers are prone to less rapid establishment. This model need not be the case for large tree components. Instead, it may be that some smaller components are more readily affected by fuel treatments. Multiple treatments may be needed to create a forest that is both fire-safe and maintains a diverse oak cohort.

Replenishment of shrub seedbank

Shrub seedling survival and growth following fuel treatments. Spring 2001 and Fall 2001. The presence of shrub seedlings in the understory is a key indicator of fuel reduction success.

Vegetation dynamics following fuel-reduction, Plot A

Vegetation dynamics following fuel-reduction, Plot A

Vegetation dynamics following fuel-reduction, Plot B

Vegetation dynamics following fuel-reduction, Plot B

Treatment area 1: hand-cut, piles burnt under ‘cool’ conditions

Plant community: Oregon white oak - buckbrush

This woodland stand included a relatively high cover of Oregon white oak with buckbrush (Ceanothuscyanus). Filling the interspaces before treatment, the shrubs were thinned and burned under conditions of very low fuel moisture (less than 5%). Treatment area 2 remained unburnt.

Treatment area 2: hand-cut, piles burnt under ‘cool’ conditions

Plant community: Oregon white oak - buckbrush

This woodland stand included a relatively high cover of Oregon white oak with buckbrush (Ceanothuscyanus). Filling the interspaces before treatment, the shrubs were thinned and burned under conditions of very low fuel moisture (less than 5%). Treatment area 2 remained unburnt.

Treatment area 3: hand-cut, piles burnt under cool conditions, broadcast burn

Plant Community: Oregon white oak – whiteleaf manzanita

This woodland stand included a relatively high cover of Oregon white oak with whiteleaf manzanita (Arctostaphylos viscida). The treatment units were hand-cut and piled in 1996/1997, piled and burnt in 1998. The piles burnt partially only, imparting relatively little heat to the surrounding vegetation. This heat resulted in good regeneration of the shrub seedbank allowing the persistence of the herbaceous component.

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CONCLUSIONS

A few lessons learned from fuel-reduction projects in the Lower Thompson Creek Valley:

1. Oak/white oak stands are complex, fine-scale and multi-dimensional, with a mix of basalt fueling and whiteleaf manzanita. 
2. On the lower part of the slope, whiteleaf manzanita is considered a fire-dependent species. However, as evidenced by mowing, thinning, and treatment, other species within this complex, fine-scale fuel habitat are now considered to be fire-independent. 
3. Treatment area 1 is composed of shrub and whiteleaf manzanita (Treatment area 2). 
4. Treatment area 2 is composed of Oregon white oak and buckbrush (Treatment area 3). 
5. The overall effectiveness of fuel treatment treatments is likely due to the ‘heat treatment’ following pile-burning trials. 
6. Hardwood vegetation was considered intolerant of shrubs within 15 years. 
7. Broadcast burning within the control of shrub species is not possible after the disappearance of grasses. 
8. Oak trees damaged by the broadcast burn have generally recovered their canopy size in 5 years.

Managements solutions

1. Broader burning strategy, multiple entries, allows for better control of shrub and tree regeneration. 
2. Apply follow-up broadcast burn within 3 years of initial hand-cutting and piling.

Note: strong growth of native grasses following initial treatments in 1999. Buckbrush in the treated and control areas started flowering in 1996. Note the development of Oregon white oak canopy from epicormic buds stimulated by the heat from pile-burning.