

Monitoring Summary

Turkey Springs Brockover Mesa Prescribed Fire 2019

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Mastication Treatment: The Brockover Mesa Prescribed fire occurred in geography that was previously treated as part of the Turkey Springs Mastication project. The mastication project occurred in 2016 and was designed to reduce shrub cover and fuel connectivity in the forest understory by chipping shrubs and small trees (see Turkey Springs Mastication Treatment Report). The Brockover Mesa Prescribed Fire occurred in September of 2019. Primary objectives of the prescribed fire were to maintain lower shrub cover, raise ladder fuels, and consume forest fuel loads. These projects occur adjacent to the Wildland Urban Interface where intermixed low density housing developments exists. **This report includes monitoring data from a subset of the data included in Turkey Springs Mastication Treatment Report** since not all plots within the stewardship treatment area were burned in the 2019 prescribed fire.



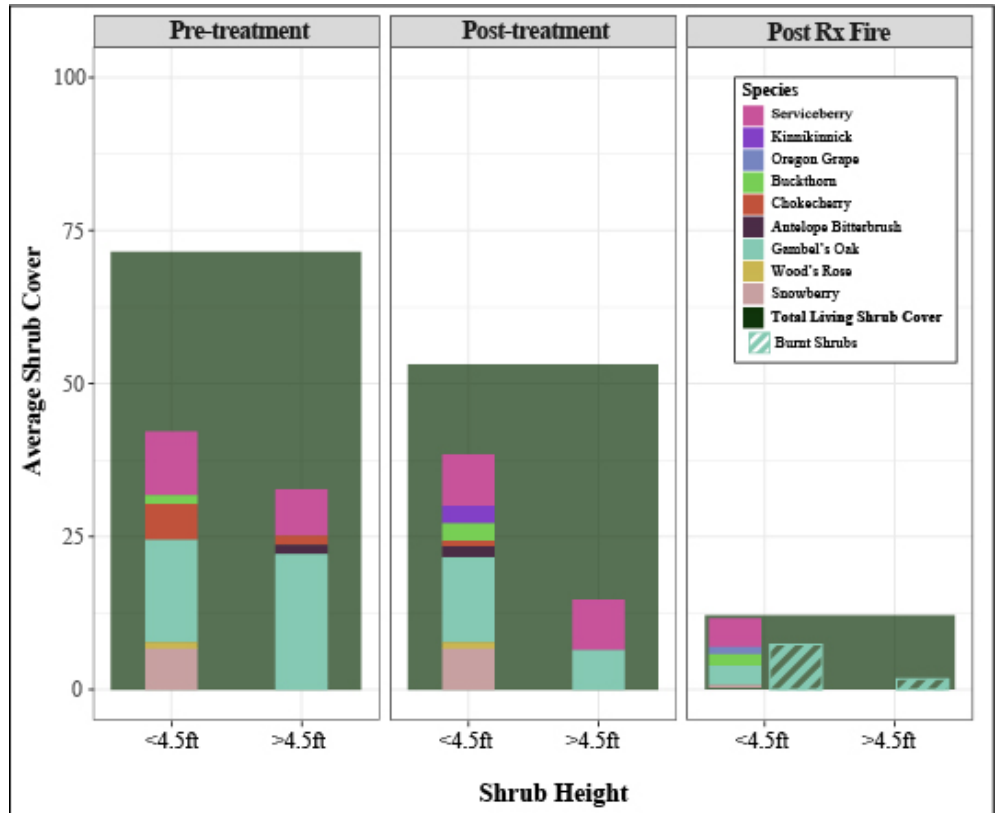
The 2019 prescribed fire was conducted in September of 2019 and utilized hand ignition teams as well as UTV based ignitions to burn close to 1500 acres in three days. The fire was supported by the Nature Conservancy's Prescribed Fire Training Exchange (TRES) as well as Blue Ridge Hotshots and other local and regional resources.

Project Highlights: Shrub cover following mastication treatments was significantly reduced and the Brockover Mesa Prescribed Fire appears to have effectively maintained lower shrub cover and burned at least 50% of standing oak cover. The Brockover Mesa Prescribed Fire was also effective in raising crown base height by an average of 12 feet. Additionally, forest fuel loads were significantly decreased. Approximately **69%** of ground cover was burned across the landscape on average, however some areas saw 98% area burned, demonstrating effective fire effects and fire spread. The below photo from burn unit I is an effective representation of the burn area monitored and shows a mix of green oak and burnt oak cover while also demonstrating scorched canopy bases effectively raising canopy base height.



Forest and Fuels Inventory

Shrub cover: Shrub cover prior to mastication treatment totaled 72%. Shrubs less than 4.5 feet in height were more common than taller shrubs with approximately 40% cover attributed to shorter shrubs. Following mastication treatment, there was no change in the total cover of shorter shrubs, however, there was a change in species composition. Taller shrubs were reduced by more than 50% after mastication treatments, resulting in total shrub cover of 52%. Following prescribed fire, total shrub cover was reduced to 13% resulting in a reduction of 39%; taller shrubs were



mostly undocumented, and those that were present were burnt. Observations not documented in data show that tall groups of oak were scattered about the landscape, but were generally uncommon. Shorter shrubs were common, and there was a 32% reduction of short shrub cover by burning changing shrub cover from 40% to 13%. While data did not capture all burnt shrub cover, the difference in total cover suggests that many black stems with 0% foliar cover contribute to this discrepancy. Overall, the 39% reduction in shrub cover from prescribed fire supports the burn objectives of the fire.

Tree height and ladder fuels: All tree species recorded were ponderosa pines. In these treatment units, there was only a slight increase of about one foot in crown base height following stewardship mastication treatments. Following fire, scorch height, on average, raised crown base height by 12 feet. Generally, most trees were still left with significant bulk green canopy, thus tree mortality is likely to be low following the fire. Data recorded a few small understory trees being fully scorched and observers noted that there were small pockets of higher scorch heights where some mortality may occur. Overall, these mortality events will be beneficial in terms of reducing ladder fuels and canopy fuel connectivity. Additionally, trees that were once observed in or near plots as standing green trees burned out and fell, creating greater habitat complexity. The forest structure post fire consists of scattered standing snags, downed snags, pockets of canopy connectivity via tree clumps, and numerous openings and pockets of lower tree densities than existed before fire was applied to the landscape. Data also documented **8 trees per acre of ponderosa pine regeneration**, but observers noted that there were pockets in openings that have more dense regeneration.

Fuels: Fuel loads were relatively high following stewardship treatment, however since fuel loads were not collected pre-treatment it is hard to determine how the mastication treatment influenced fuel loads. Following prescribed fire, however, fuel loads decreased significantly. Additionally, the prescribed fire resulted in forest floor conditions that had **12% bare soil and 78% litter cover** on average. These conditions are favorable for ponderosa pine regeneration, soil moisture retention, and less likely to have long residence times during future fires.

Management Suggestions

Overall, the combination of shrub mastication and prescribed fire has resulted in forest conditions that are favorable for diverse social and ecological values. The reduction of shrub cover results in forest structure that has less continuous fuels and more complex conditions favorable for wildlife habitat and ponderosa pine regeneration. Observers noted few clumps of large oak remaining on the landscape; this condition allows oak to be a continuous component of the landscape that supports bird habitat and adds both horizontal and vertical spatial complexity to forest structure. The prescribed fire also successfully raised crown base heights without charring or scorching so much of tree height that high levels of tree mortality occur. Observers also noted dense pockets of ponderosa pine regeneration. Repeated fire entries can help ensure these pockets of regeneration are thinned prior to seedlings and saplings becoming overstory trees, resulting in overly dense pockets that create the potential for tree suppression and undesirable fire behavior. Lastly, fire covered **69%** of the ground area and significantly reduced forest fuel loads, creating conditions more in line with historical range of variation. Repeated fire entry can help maintain these favorable conditions, and managers should take note of fuel conditions that gave rise to successful fire spread and burning of oak on this incident. Higher fuel loads in oak foliage may create less desirable fire results. Additionally, these patterns contradict patterns observed on Lower Middle Mountain, suggesting repeat management of oak by mechanical or fire treatments can help reduce oak cover.

