

# **2015 City of Ashland Prescribed Burn- Unit P/Q**

## Assessment of Accomplishment of Resource Management Objectives

Marty Main, July 2015

### **Setting and Conditions**

Unit P/Q was prescribed underburned on April 30, 2015. The burn was completed by Grayback Forestry in one day, even though initial ignition did not occur until ~11:00. Chris Chambers and Marty Main were on site at the beginning of the burn. Main stayed for the duration; Chambers left after a short while to work on a second joint AFR/COA burn in AFR Unit 12.

### **Monitoring using CBI Method**

Ten Composite Burn Index (CBI) plots were systematically installed throughout the burn unit on July 7, 2015. CBI results verified the very low intensity of the prescribed underburn in Unit P/Q with an overall unit CBI score of only 0.387 (typically, low intensity fire rates out at 0.5-1.5 on the CBI scale, so the burn in this unit did not even reach the low end of CBI ratings for low intensity fire). The burn intensities and first order fire effects were relatively homogenous throughout the unit, as overall CBI scores only ranged from 0.158 to 0.684 on the ten plots. Erratic fire behavior and/or flare-ups of higher intensity did not occur in the burning of this unit. However, overall CBI results were strongly influenced by very low ratings (0.09) for fire effects on the overstory in the unit (primarily because the overstory was large with a good height to crown base), while CBI numerical ratings for the understory were higher and into the range of values for low intensity fire (0.72), indicating some success in reducing surface and ladder fuels. Understory surface and ladder fuels were not abundant, however, as they had been significantly reduced by previous treatments (1999, 2007-08) in the unit, including subsequent piling and burning of resulting slash.

### **Discussion**

Fire behavior was generally low throughout the day, with flame lengths rarely more than 2'. It was initially hoped that burning could begin as early as 8:00, as fuel moistures were 11.1% for 10 hr fuels and 13.4% for 100 hr fuels- right within the prescription range. However, initial test burns revealed that fire was not carrying, likely due to the high RH's and low temperatures on the unit, as well as the moderating influences of the overstory canopy. Ignition did not begin until approximately 11:00 when RH's lowered to 50%. Even so, burning was patchy and did not carry well due to discontinuous fuels and particularly the moderating effects of the established overstory canopy throughout the unit. Burning and consumption was somewhat better from 12:30-3:30 (12:30- 62 degrees, 44% RH), particularly on more southerly aspects and on more exposed lateral ridgelines. Predicted low RH's (20-25%) never materialized which also reduced expected fire behavior, as did green-up in some locations. The most productive fuel consumption occurred with burning in small patchy fuel accumulations, old rotten stumps and uncommon ladder fuels, especially Pacific madrone sprouts. End-of-day attempts to re-ignite

unburned portions at the top of the unit where consumption had been spotty upon initial ignition were largely unsuccessful as temperatures were lowering, humidities rising and fuels even more discontinuous than upon initial ignition.

Approximately 50-60% of the unit area was blackened; mosaic burning left islands of unburned fuels, particularly at 1) the bottom of the unit canopy towards the end of the day when temperatures were cooling and relative humidities were higher closer to Ashland Creek and canopy levels were high; 2) at the top of the unit early in the morning under canopy when temperatures were too low (<50) and RH's too high (>50). Estimate 40-50% of the 1 hr fuels consumed; 20-30% of the 10 hr fuels; 5-15% of the 100 hr fuels and 0-10% 1-5% of the large 1000 hr fuels. Pre-burn fuels on this unit were characterized by low amounts (17.2 tons/acre, of which only 4.7 were fuels > 9" ) Duff retention was good, especially given that slightly less than half of the area was estimated to have been unburned mosaic. Very low amounts of duff to begin with (0.53 inches average). Although a very small amount of surface soil erosion may occur on the steeper slopes (>50%), especially where fire intensities were the hottest, it is expected that very little surface soil erosion will occur over most of the unit, especially since canopy cover is well established throughout this unit. Scorch heights were typically 1-4', but ranging rarely up to 12 feet. Rate of spread of fire was low throughout the day and usually required repeated strip head firing in order to maintain any consistent flame length. Rate of spread was highest in early afternoon from 1:00-3:00 in mid-slope positions, particularly on more southerly aspects.

Additional tree mortality over time is not expected due to generally low flame lengths and trees of larger sizes, elevated canopies and good vigor. Needle and leaf mortality from heat (not actual consumption) was low given the generally larger trees (12-30" dbh) with elevated foliage (30-50' height to crown base)- all factors that will likely minimize the potential for future mortality. Elevated bark beetle populations from several previous years of drought may contribute to a limited amount of additional mortality (e.g. red turpentine beetle, western pine beetle, mountain pine beetle and/or pine engraver beetles in ponderosa and sugar pine and flatheaded borer in Douglas-fir), although this is not expected to have been aggravated by the very low intensity prescribed fire. Recent research suggests that in fact low severity fire may aid trees in providing additional resistance to attacking bark beetles. Mortality of ladder fuels was good, although they were not common in the subunit. Pacific madrone sprouts and occasional small Douglas-fir advanced regeneration up to 10' were the primary ladder fuels killed by the fire. Understory conifer seedlings/saplings were rare in the unit.

## Summary

Prescribed underburning in Unit P/Q was only partially successful at meeting Burn Objectives as outlined in the Prescribed Fire Plan, as described below.

1. **Return low intensity fire as an ecosystem process.** This was accomplished, although one could argue that the burn intensity, as measured by CBI was too low to qualify as a low intensity fire.

2. **Reduce light fuels 3 inches and less by 40-70%.** This objective was likely not met, particularly given that close to 50% of the unit was unburned and fuels > 1" were usually not consumed. Although no specific measurements were taken, CBI results rated 1.1 for the category "Litter/Light Fuel Consumed" which includes all fuels up to 3" diameter.
3. **Maintain medium fuels 3-8 inches by 50% or more.** This objective was met, although very little 3-8" fuels were consumed.
4. **Maintain heavy fuels greater than 8 inches by 70% or more.** This objective was met, although very little fuels of this size was consumed.
5. **Maintain existing preferred conifer overstory trees (pine, Doug-fir, oak) by limiting overstory mortality to 10% or less for these species.** This objective was met; little, if any, overstory mortality occurred as a result of the burn itself and is not expected in the future.
6. **Maintain existing effective ground cover of litter/duff by limiting bare soil exposure to 30% or less from ignition.** Quantitative data is not available, although CBI results suggested that slightly less than 50% of the area remained unburned, and with the low intensity of the fire in most places, it is highly likely that this objective was met.

## **Recommendations**

Higher burn day RH's than predicted, low and discontinuous fuels and dense overstory canopy throughout most of the unit kept fire behavior and fuel consumption lower than desired. Even though fuel moistures were right where desired, adjustments should be made in the future to have opportunities for slightly higher fire behavior, although very low fuel levels in this unit may have made it difficult to do so. Nonetheless, the unit is now an excellent fuel reduction zone with very minimal surface and ladder fuels. The existing overstory is vigorous, well-spaced, with high height-to-crown base and should be able to recover from most fires with limited mortality. Similar burning on the adjacent USFS ownership could create an excellent and strategically important fuel reduction zone that could greatly facilitate suppression activities in a wildfire event. Reduced burning at days end low in the unit retained considerable unburned mosaics that will help minimize any surface erosion/sediment delivery to riparian areas below. Given the already reduced fuel loading and effective groundcover in this unit AND the lack of developing ladder fuels, one could argue that these types of units may be a lower priority in the future than those that retain higher fuels and hazard. The type of burn completed in this unit is still desirable if "*Return low intensity fire as an ecosystem process*" and "*Promote public acceptance of prescribed underburning*" remain as the highest burn objectives, with other fuels management objectives of lesser importance.