COGGINS RX: UNIT 10 (165 ACRES)

Figure 1. Test Fire

Whiskeytown NRA

Date: October 11-12, 2016

Eamon Engber FEMO, Fire Ecologist

PROJECT OVERVIEW

Whiskeytown has a long history of wildland fires within and surrounding the boundary of the 42,000 acre park. However, anthropogenic disturbances such as logging, mining and fire suppression have altered the structure of the park's vegetation and fuels, elevating potential fire severity and decreasing ecosystem resilience. Fire may benefit Whiskeytown's fire-adapted vegetation by reducing forest fuels and maintaining the natural vegetation structure (e.g., limiting the encroachment and dominance of shade-tolerant tree species). Coggins Park is a unique area with high biodiversity and old growth forest, values to be protected under Whiskeytown's fire management program. Unit 10 is located adjacent and north of Coggins Park campground, and fits into a larger puzzle of fuel treatments and Rx fire projects focused on reducing potential wildfire behavior and returning fire to

the landscape in this area. Research and inventory work in the Coggins area has suggested a history of frequent fire pre-1925 (mean fire return interval 4.8-7.4 years, reduced after 1925), followed by encroachment of shade-tolerant species during the fire suppression era. The Coggins 10 burn was a first entry project following decades of fire exclusion.

Project Objectives

A primary objective of the Coggins burn was to ensure a safe environment for all fire personnel and public in the surrounding area. Management objectives included hazard fuel reduction, restoration of fire as a natural disturbance within the park, and protection of high value old-growth stands in Coggins Park. General objectives for the mixed-conifer forest type include reductions in pole tree density, especially for more shade-tolerant species (e.g., white fir, Douglas-fir, incense cedar, tanoak), reductions in shrub cover and height, and reductions in woody surface fuels. Woody surface fuel and stand density reduction targets are further outlined in the Fire Management Plan.

A key component of the ignition plan was to strategically ignite ridge tops and allow fire to back and flank naturally to help achieve desired fire effects and limit exposure of personnel.

PROJECT RESOURCES

Burn Boss: Tom Garcia

FIRB: Rob Winkler

Ignitions: Whiskeytown Fire Module (Martinez +3); LNF E-76, Smoke Jumpers (3-4) on day 2.

Holding: Orlando Genao

Engines: WNP E-2 (unstaffed); WNP E-4 (Tucker+3);LNF E-76

Crews: Trinity River crews 1 and 5

FEMO: Eamon Engber

SUMMARY OF BURN OPERATIONS AND FIRE BEHAVIOR

While burn day weather was moderate with low winds, cool temps, and good relative humidity recovery, heavy fuels and live fuels (shrubs including tanoak and manzanita) remained near seasonal low levels due to relatively little seasonal moisture on Whiskeytown prior to burn day(~0.3-0.4" based on nearby RAWS stations). Also, the lack of recent fire on the unit resulted in areas with heavy dead fuels, dense mid-story trees, and shrubs with a dead component and needle drape. These areas were actively burning upon ignition of the test fire.

The test fire was ignited on the ridge top at1300 in an area with some scattered slash and dense thickets of pole trees. After about 30 minutes of fire behavior observation, the FIRB, FEMO, and Burn Boss decided to suppress the test fire due to torching and high flame lengths (Figure 1 above). Ignitions were resumed in the shrubs to the north around 1645 to see if beneficial shrub consumption would occur under these conditions. Firing was generally successful in areas with needle drape (Figure 2) on the ridge top at this time, but was dampened in the tanoak brush off the ridge top where little to no long needle litter was present. Ignitions then continued south back into the timber into the evening where woody surface fuels burned well. Around 1730, some torching

occurred on the ridge top south of the test fire location due to similar fuels conditions (needle drape over Manzanita and dense pole trees; Figure 3). Fire behavior was moderated just off the ridge mid-slope to the west. Torching on the ridge top resulted in a slopover east of the ridge top handline, but was quickly picked up. Ignitions continued south along the ridge and west toward Coggins Park and Crystal Cr Rd until 2000.

Firing continued on Day 2 in the timber during the morning hours prior to the primary burn period, then transitioned into the shrubs mid-day, and was mostly complete by 1500.

TIMELINE

- **10/11/16**
    - 1300 - Test Fire
    - 1345 – Decision to suppress test fire, not meeting objectives, some torching. Crews cut line around test fire.
    - 1530- New section of line installed on ridge north of test fire, then west down to Crystal Cr Rd to capture ~8 acres of brush for a test fire in shrub component.
    - 1645 – Ignited brush. Burned well and within prescription on ridge top where needle cast and manzanita were present, but was dampened in pure brush (tanoak) mid to lower slope.
    - 1730 – Decision to work back to the south in the timber toward Coggins Park Campground. Pure tanoak brush no longer burning well. Started on Ridgetop then worked down to the west and south. Still burning well with some torching on ridge-top, but cooler immediately off ridge to west.
    - 1740 – some slopover east across ridge-top handline due to torching on ridge. Ignitions held up for ~1 hr to suppress, then ignitions continued until ~2000 toward Coggins Park Campground.
- **10/12/16**
    - 0800 – Briefing
    - 0900 – Ignitions began east of original test fire on east slope in the timber. Plan was to burn timber in the morning then brush later in the day when more consumption would occur.
    - 1030 – Jumpers arrive (3 or 4), and they work down ridgeline to the north and on east side of ridge, toward Crytal Cr road switchback. Whiskeytown module works the west side of the ridge. Generally burning well on ridgetop (slightly hotter than desirable, some torching) and somewhat dampened on lower slopes and shaded aspects in tanoak brush. Burn boss adds a little depth on the east side, coordinating with Jumpers.
    - ~1330: Jumpers tied in to Crytal Creek Road on North side of unit (switchback).
    - 1500: Primary ignitions complete and tied in to Crytal Cr road. Some ignitions continue on East side to add depth and encourage backing fire.

Figure 2. Consumption of shrubs on Day 1 afternoon primarily occurred in areas of needle drape on ridge top and upper slopes. Lower slopes with tanoak burned intermittently with low consumption (maybe 30%).

Figure 3. Torching on ridge south of the test fire on Day 1. Fire behavior moderated downslope from ridge.

WEATHER SUMMARY

See attached weather observation sheet.

Observed winds were mostly light and upslope, with a south component on day 2. Maximum gusts to 5 mph early afternoon on Day 1 and maximum gusts to 4 mph on Day 2 at 1100. Relative humidity troughed to 40% on Day 1 and 43% on Day 2. Temperature peaked at 65° and 62° F on Day 1 and 2, respectively. Pig ranged from 20-50%.

FIRE EFFECTS SUMMARY

The mix of shrubs and conifers in the Coggins 10 unit present challenges to achieving fire effects objectives in any given burn window. Some areas are likely to burn at higher intensities than desired while other areas (dense tanoak patches on lower slopes) may not carry fire at all. Further, the long time period since last fire (this was a first-entry project) resulted in heavy accumulations of dead and down fuels in forested portions of the unit. Overall conditions were leaning toward the dry end based on seasonal moisture deficit (but not day of burn ambient conditions), therefore on ridge tops and upper slopes woody fuels consumed well. Fire intensity was slightly above desirable on the ridge tops based on observed intermittent torching, although backing fire away from the ridge had low flame lengths (<1 ft) and rates of spread, and was on target. Where accumulations of long needle litter and Manzanita occurred on ridge top locations, fire was more likely to climb into thickets of small trees and sometimes torch larger conifers (Figure 3 above). On mid-slopes in exposed locations fire behavior in shrubs (tanoak and Manzanita) was within objectives and consumed ~50% of foliage. On lower slopes in shrub-dominated patches (mostly tanoak), fire spread was intermittent and quite patchy. Strategic ignitions that occurred late in the day, and on ridge tops, allowed fire to back during the nighttime period and into the second day, therefore moderating fire intensity as much as possible.

One option for reducing fire intensity on ridge top locations without limiting the ability to achieve fire effects objectives on lower slopes would be to increase the use of mechanical treatments of shrubs in ridge areas where mature overstory trees are present.

Figure 4. Substantial stump and woody fuel consumption on ridge top.

Figure 5. Good manzanita consumption on ridge top location with long-needle litter drape.

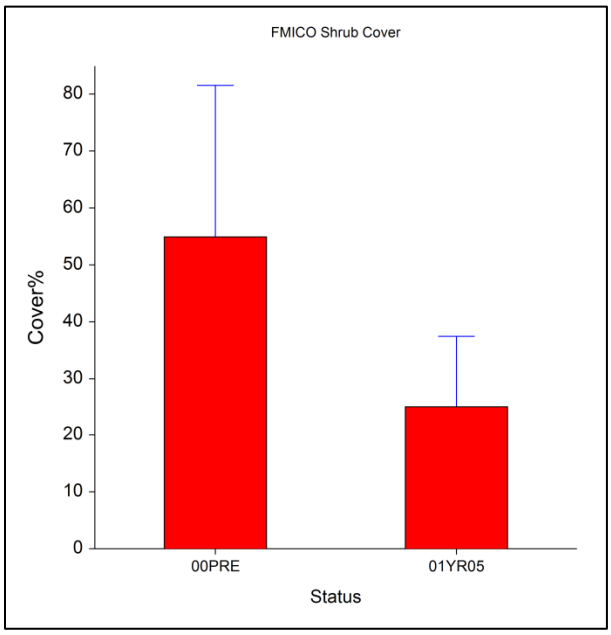

Figure 6. Shrub cover change in the mixed conifer monitoring type following single burns in the Coggins and Queen Mary units (1994 & 1996; 9 plots).

FIRE WEATHER OBSERVATION FORM

FIRE NAME: Coggins Unit 10 | **DATE: 10/11/2016** | **OBSERVERS: Engber**

TIME	LOCATION	ELEVATION	ASPECT	DRY BULB	WET BULB	RELATIVE HUMIDITY	WIND SPEED (GUSTS)	WIND DIRECTION	% CLOUD COVER	% SHADING	FINE DEAD FUELMOISTURE	PROB. OF IGNITION	COMMENTS (PRECIP, FIRE BEHAVIOR, SMOKE, ETC)
1130	Top of unit N of test fire	4190		58	47	46	2 (5)	N/upslope	0	EXPOSED		30	
1300	Top of unit N of test fire	similar		60	49	47	3 (5)	N/Upslope	0	EXPOSED		40	Test fire torching, some slash present
1400	Top of unit N of test fire	similar		60	49	47	2 (5)	N/Upslope	0	EXPOSED		40	1345 Decision to shut down test fire
1500	Top of unit S of test fire	similar		65	51	40	0 (2)	UPSLOPE	0	EXPOSED		50	
1600	Ridge N of Test Fire	similar		63	50	42	1 (3)	UPSLOPE	0	EXPOSED		40	1630 Decision to ignite 2nd test fire in shrubs to north
1700	East slope E of Test Fire	similar		60	48	43	1 (3)	SE	0	EXPOSED			
1800	Ridge South of Test Fire	similar		60	48	43	1 (3)	SE	0	SHADED		20	
1900	East of Ridge upper 1/3rd	similar		58	47	46	0	SE	0	SHADED		20	
2000	East of Ridge upper 1/3rd	similar		58	47	46	1 (2)	SE	0				

MAX TEMP: 65 MIN RH: 40 MIN TEMP: 58 MAX RH: 51

TIME OF MAX TEMP: 1500 TIME OF MIN RH: 1500 TIME OF MIN TEMP: 2000 TIME OF MAX RH:1300

FIRE WEATHER OBSERVATION FORM

FIRE NAME: Coggins Unit 10 | **DATE: 10/11/2016** | **OBSERVERS: Engber**

TIME	LOCATION	ELEVATION	ASPECT	DRY BULB	WET BULB	RELATIVE HUMIDITY	WIND SPEED (GUSTS)	WIND DIRECTION	% CLOUD COVER	% SHADING	FINE DEAD FUELMOISTURE	PROB. OF IGNITION	COMMENTS (PRECIP, FIRE BEHAVIOR, SMOKE, ETC)
0800	Ridge in Unit 1	4100		45		67	0(1.5)	S	10	EXPOSED		20	
0900	E side of ridge in unit 10	similar		57		45	0 (1)	S	10	EXPOSED		30	
1000	Ridge, north of original test fire	similar		57		45	0 (3)	upslope	10	EXPOSED		30	
1100	W side of N ridge	similar		58		46	2 (4)	S W	20	EXPOSED		30	
1200	N Ridge lower 1/3rd slope above Crystal Cr Rd	similar		60		43	Light	upslope	20	EXPOSED		50	
1300	N Ridge lower 1/3rd slope above Crystal Cr Rd	similar		62		49	1 (2)	W	20	EXPOSED		40	
1400	N Ridge lower 1/3rd slope above Crystal Cr Rd	similar		62		53	Light	upslope	20	EXPOSED		40	
1500	N side of unit below Crystal Cr Rd.	similar		61		52	light	upslope	20	EXPOSED		40	