# Fuels and Fire Behavior Digital Dictionary

## The Fire Behavior Assessment Team

| Willow Fire | 7/31/2015 |
|---|---|
| Plot 4 | Region5/Sierra NF |



Transect 1, Pre, 0-50 ft



Transect 1, Post, 0-50 ft

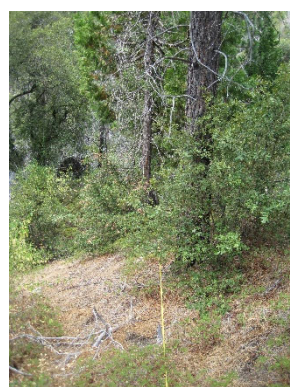

Transect 1, Pre, 50-0 ft



Transect 1, Post, 50-0 ft



Transect 2, Pre, 0-50 ft



Transect 2, Post, 0-50 ft



Transect 2, Pre, 50-0 ft



Transect 2, Post, 50-0 ft



Transect 3, Pre, 0-50 ft



Transect 3, Post, 0-50 ft

Transect 3, Pre, 50-0 ft
No Photo



Transect 3, Post, 50-0 ft

## Fuels, Topography, Weather

| Site Info | |
|---|---|
| Veg Type | Mixed conifer, bear clover, manzanita understory |
| Slope (%) | 25 |
| Aspect (deg) | 320 |
| Elev (ft) | 4,733 |

| Climatic Variables | |
|---|---|
| Fire Arrival (Date, Time) | 7/31/15, 07:08 |
| Burn End (Date, Time) | 7/29/15, 07:38+ |
| 20ft Wind (mph), 10min avg/gusts | 5/9 |
| Onsite wind (mph), eyelevel (*20min avg) | 3.4 |
| Wind direction | 280 |
| RH% | 34 |
| Temp (F) | 73 |
| ERC/BI | 56/31 |
| Drought Index | n/a |
| Live FM% (Herb/Woody) from RAWS | 30/118 |
| Live FM% (taken onsite) | n/a |
| Dead FM% (1/10/100/1000hr) | 10/10/10/12 |

| Fuel Model (low/high) | | |
|---|---|---|
| 161/165 | | |

| Surface Fuels - Pre | Tons/ac |
|---|---|
| 1-hour | 0.5 |
| 10-hour | 1.4 |
| 100-hour | 4.4 |
| 1000-hour | 16.3 |
| Litter | 3.8 |
| Duff | 13.2 |
| Total  Fuels | 39.6 |

| Understory  Veg. | Tons/ac |
|---|---|
| Live/Dead Shrub | 3.27 / 0.103 |
| Live/Dead Herbaceous | 0.003 / 0.002 |

| Canopy & Stand | |
|---|---|
| Canopy Bulk Density (kg/m$^3$) | 0.0256 |
| Canopy Base Height (ft) | 30 |
| Basal Area (ft$^2$/ac) | 99 |
| Overstory Trees/ac | 25 |

Climatic Variable Details: Willow fire onsite eyelevel wind based on 20min ave. Weather and fuel moistures taken from Northfork RAWS station using NFDRS 2016. Onsite wind was collected from an anemometer. ERC and BI are scores, not percentiles.

Site History: 2001 North Fork fire.  Salvage logging.  Dead and dying trees in the area due to severe CA drought.

## Fire Behavior

| Fire Behavior | |
|---|---|
| Primary Fire Type | Surface |
| Secondary Fire Type | Single torching |
| ROS - sensor source (ch/hr) (min/max/avg) | 6.0/14.3/9.1 |
| ROS - video interp. (ch/hr) (min/max/avg) | 8/82/9 |
| Flame Length (ft) (min/max/avg) | 5/15/10 |
| Direction Fire Spread is going (azimuth) | 160 |

| Fire Video | Description |
|---|---|
| | |
| | |
| | |

Fire management actions affecting plot:


Average fire behavior at Plot 4.


Torching as fire enters Plot 4.

Willow Fire, Plot4, 2015

## Fire Effects

| Fire Severity | |
|---|---|
| Substrate Score (1-5) | 3.0 |
| Understory Vegetation Score (1-5) | 3.3 |
| Avg % tree canopy scorch | 77 |
| Avg % tree canopy torch | 2 |
| Avg tree bole char (ft) | 14 |

| Fuel Consumption | % |
|---|---|
| 1-hour | 97 |
| 10-hour | 93 |
| 100-hour | 100 |
| 1000-hour | 96 |
| Litter | 100 |
| Duff | 100 |

Severity category definitions: 1= unburned, 2=low, 3=moderate, 4=high, 5=very high
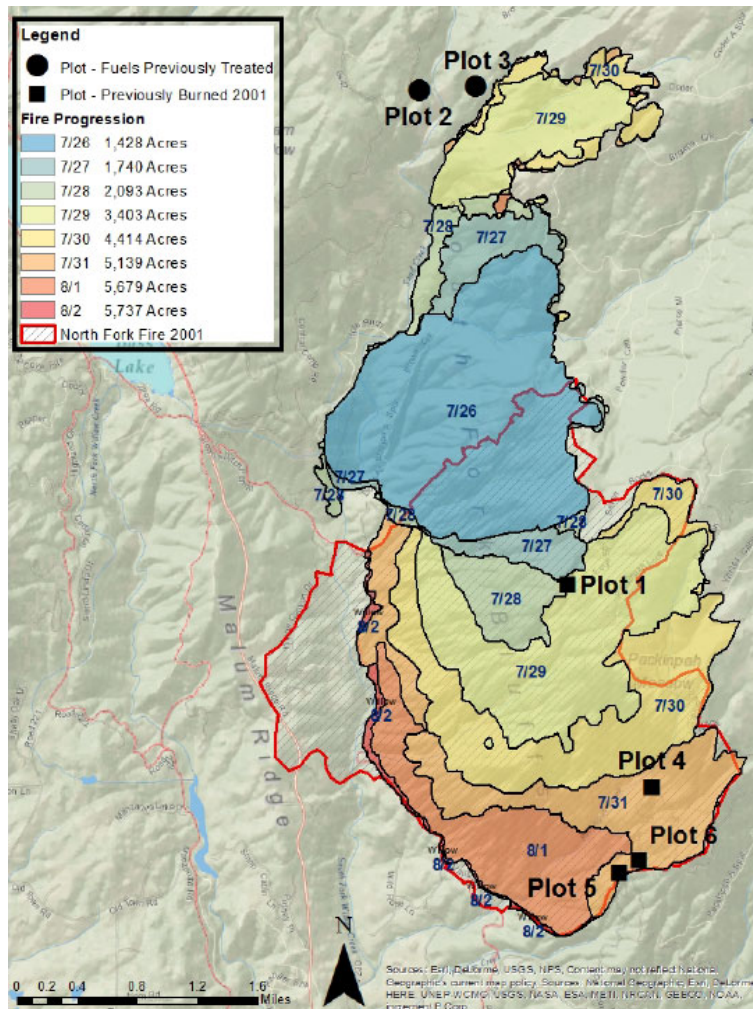


Willow Fire, Plot4, 2015

# About the Fire Behavior Assessment Team (FBAT)

Abstract

Despite the scope of the US wildfire problem, capabilities for monitoring active wildfires to answer pressing questions about fire behavior and personnel safety are severely limited. The **Fire Behavior Assessment Team (FBAT)** is the only team currently collecting applied science data on active wildfires. FBAT functions in collaboration with land managers and interested research groups.   In coordination with incident management, sites are placed opportunistically ahead of the fire accounting for current and expected fire behavior, safe access, and fire management tactics.

FBAT can collect standard weather, fire behavior and fire severity observations as well as set up dataloggers which store wind speed, direction, temperature and RH.  FBAT can also take plot data which includes:
- Heat resistant fire behavior equipment left on-site (video camera, 5-foot anemometer, sensor array for rate of spread/temperature profile through time, heat flux sensor).
- Fuels data collected on canopy, surface and ground fuels before and after the fire, and fire severity assessment post-fire.  Fuel moisture data is often collected prior to the fire.

More information about methods and data can be found on the FBAT website: https://www.frames.gov/fbat/home

The report for this fire which includes field methods and other background can be found at: https://www.fs.fed.us/adaptivemanagement/reports/fbat/2015WillowFire_FBAT_Summary_draft19Jan2016.pdf