

# Wildfire effects on yellowjacket wasp communities in mixed-conifer forests of the central Sierra Nevada, CA



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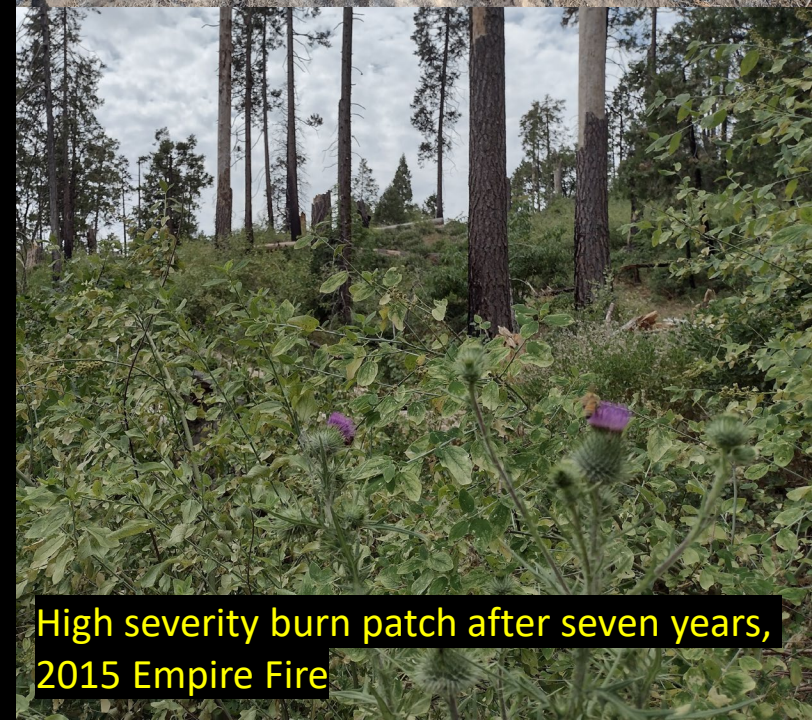


**Using synthetic lures to sample the local yellowjack (YJ) community inside three CA wildfire boundaries 1, 2, 5, and 7 years following ignition year, objectives include:**

1. Determining whether post-burn YJ abundance and diversity vary among wildfire burn severities within an individual burn boundary
2. Documenting how post-burn patterns in YJ abundance and diversity change over time following fire
3. Determining whether burn severity affects patterns of YJ community responses to wildfire over time
  - *Do YJ populations take longer to recover in high severity fire?*
4. Determining relationships between YJ diversity and forest habitat structure in CA ponderosa pine forests

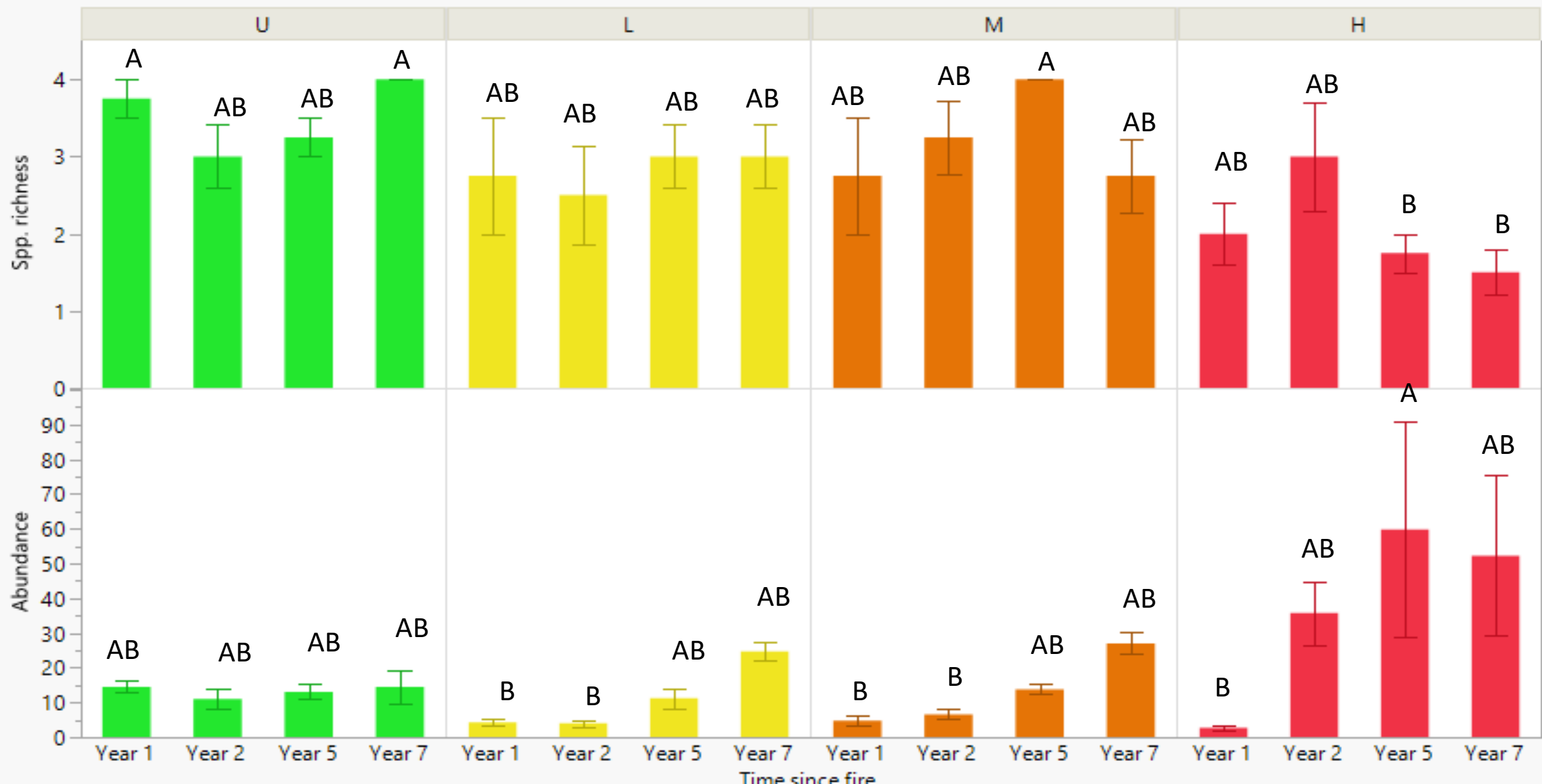


High severity burn patch after two years, 2020 Creek Fire

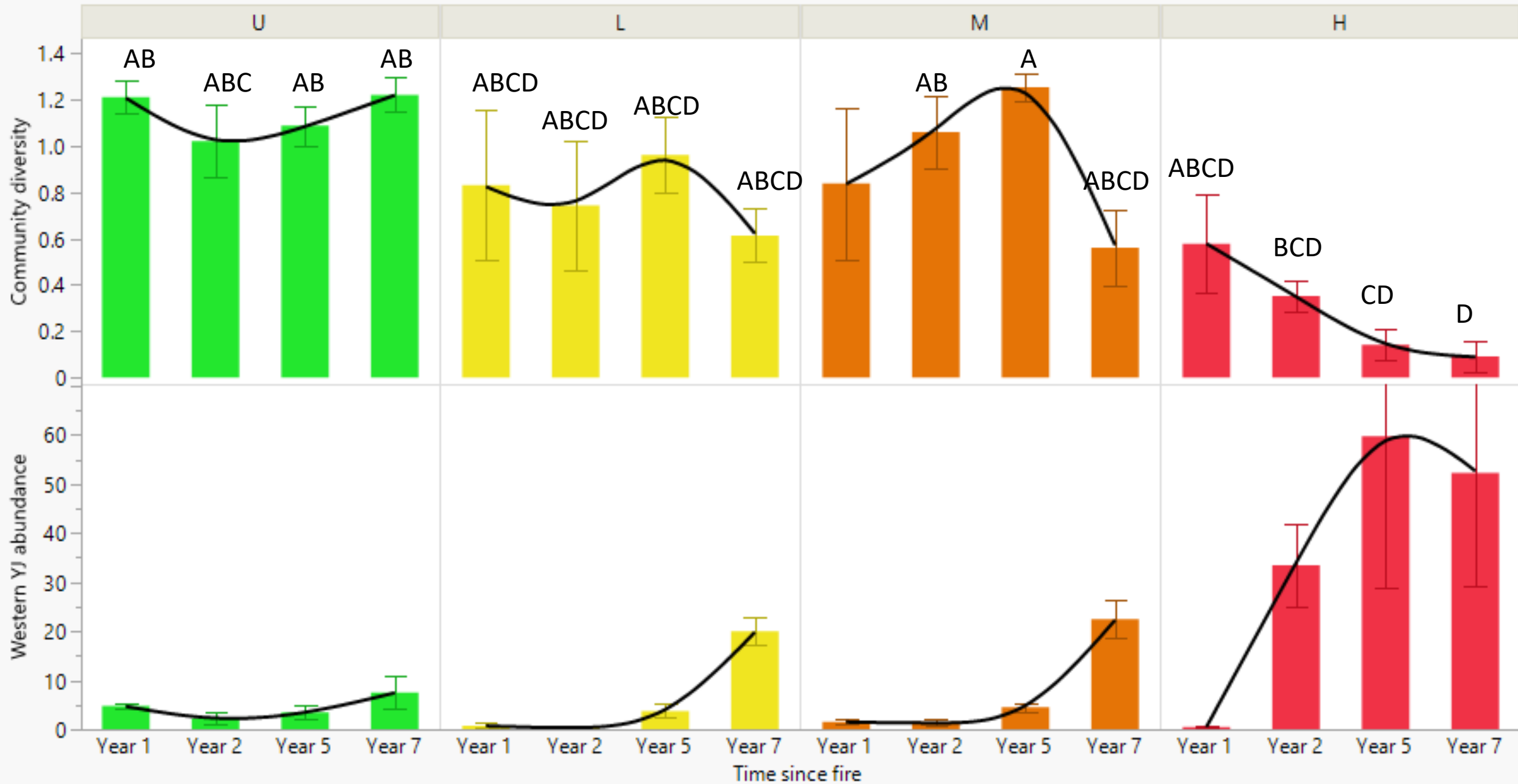


High severity burn patch after seven years, 2015 Empire Fire

# Comparing YJ spp. richness (top) and abundance (bottom) among burn severities over time



# Comparing YJ community diversity (top) and western YJ abundance (bottom) among burn severities over time





# Modeling yellowjacket abundance and diversity relationships with forest structural attributes

## With western YJ

- Abundance ( $R^2=0.62$ )
  - (+) correlations: time since fire (TSF), burn severity, bare soil, coarse woody debris (CWD)
  - (-) correlations: litter cover
- Richness ( $R^2=0.51$ )
  - (+) correlations: % Canopy closure (CC), CWD
- Diversity ( $R^2=0.59$ )
  - (+) correlations: herbaceous plant cover (HC)
  - (-) correlations: TSF, burn severity, bare soil

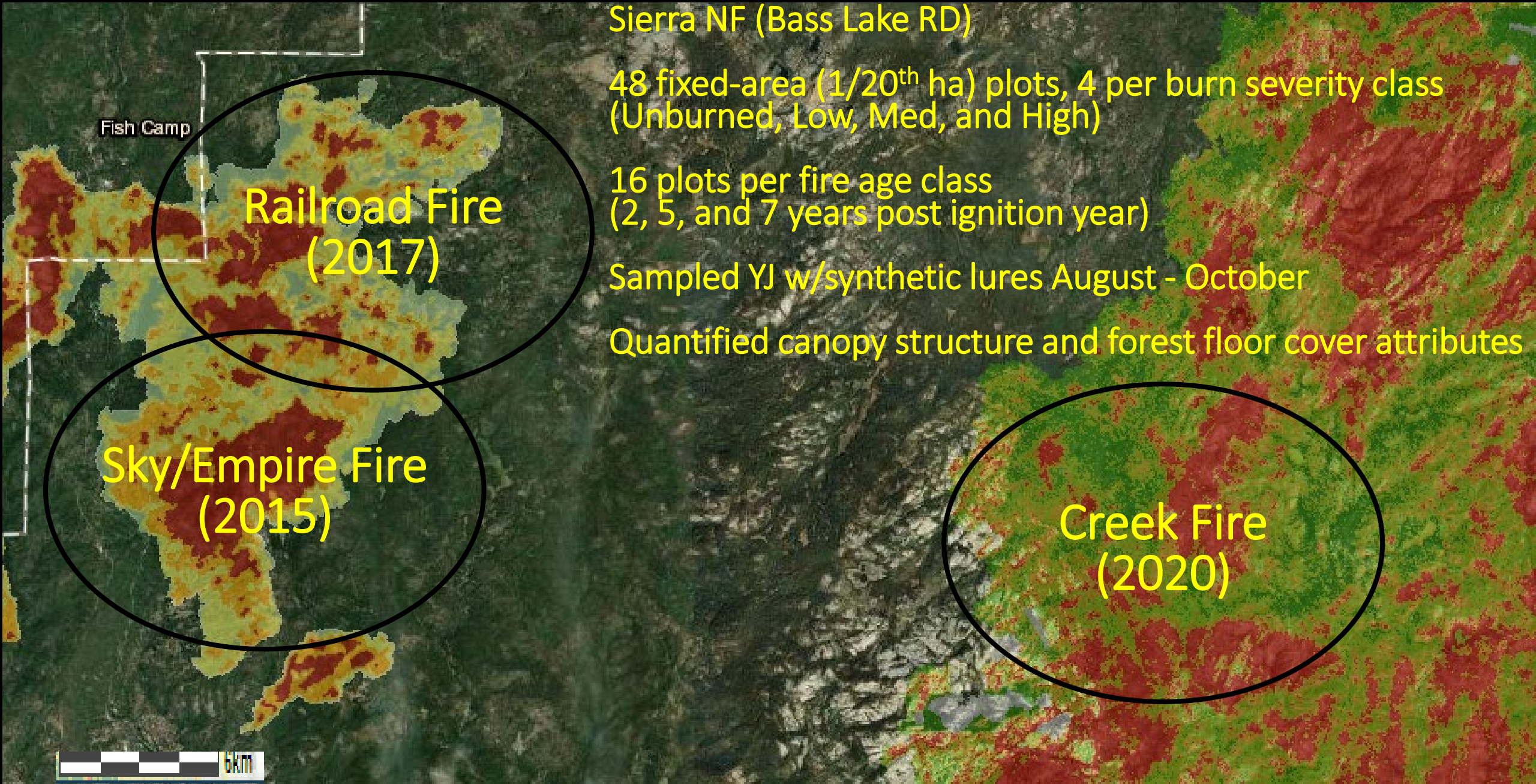
## Without western YJ

- Abundance ( $R^2=0.53$ )
  - (+) correlations: HC, CWD
  - (-) correlations: TSF, shrub cover, burn severity
- Diversity ( $R^2=0.42$ )
  - (-) correlations: TSF, burn severity, bare soil



Western YJ nest entrance

## Study Sites, Sampling Methods



Sierra NF (Bass Lake RD)

48 fixed-area (1/20<sup>th</sup> ha) plots, 4 per burn severity class (Unburned, Low, Med, and High)

16 plots per fire age class (2, 5, and 7 years post ignition year)

Sampled YJ w/synthetic lures August - October

Quantified canopy structure and forest floor cover attributes

Fish Camp

Railroad Fire  
(2017)

Sky/Empire Fire  
(2015)

Creek Fire  
(2020)

6km