Diamond Mountain Watershed Restoration and WUI Project

Eagle Lake Ranger District, Lassen National Forest

2016

Objective

Implement watershed restoration and fuel treatments within a Wildland Urban Interface

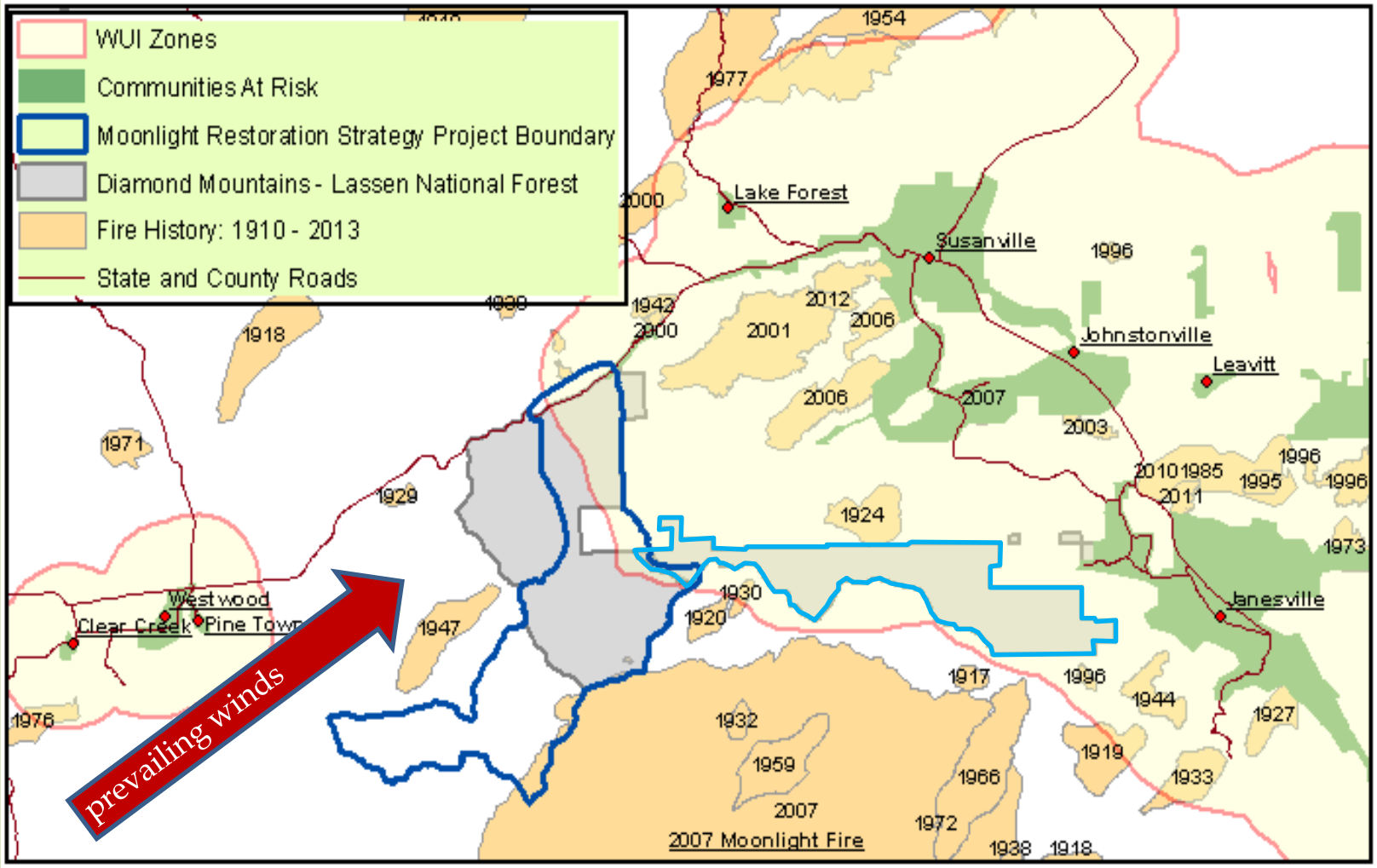
<u>Key point included in treatments</u>

1. decrease fuels
2. improve forest health
3. increase forest resiliency to disturbances
   (e.g. wildfire, pests, disease, and drought)
4. restore hardwood, riparian, and meadows
5. improve ingress and egress
6. road improvements for watershed function
7. protect closed canopy habitat

<u>Challenges</u>

1. steep slopes
2. erodible soils
3. lack of access
4. closed canopy habitat requirements
5. economics

WUI – (Diamond project area has not had fire >100 ac since 1910)



However – Within and adjacent to the Diamond project there have been 808 wildland fires on FS lands from 1911-2013 with only 17 fires >10 ac and only 5 fires > 100 ac . Therefore - we are good at suppression!

Changed Landscape

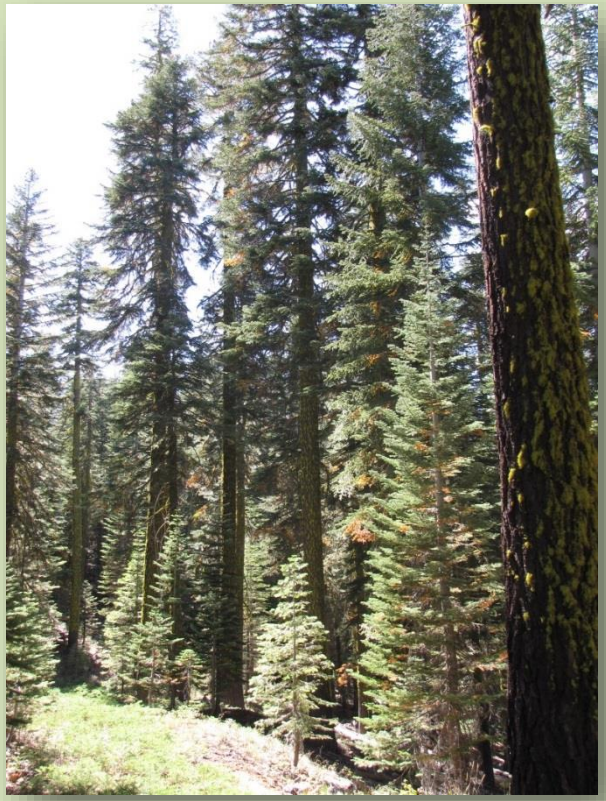
early 1900s

1990s

1. Forest composition
2. Structure – size class, density, fuels
3. Pattern
4. Process – restore fire

Existing Forest Structure

1. Too many trees
2. Altered species composition and forest structure
3. Excessive fuel loads
4. Highly susceptible to wildfires
5. Highly susceptible to insect and disease

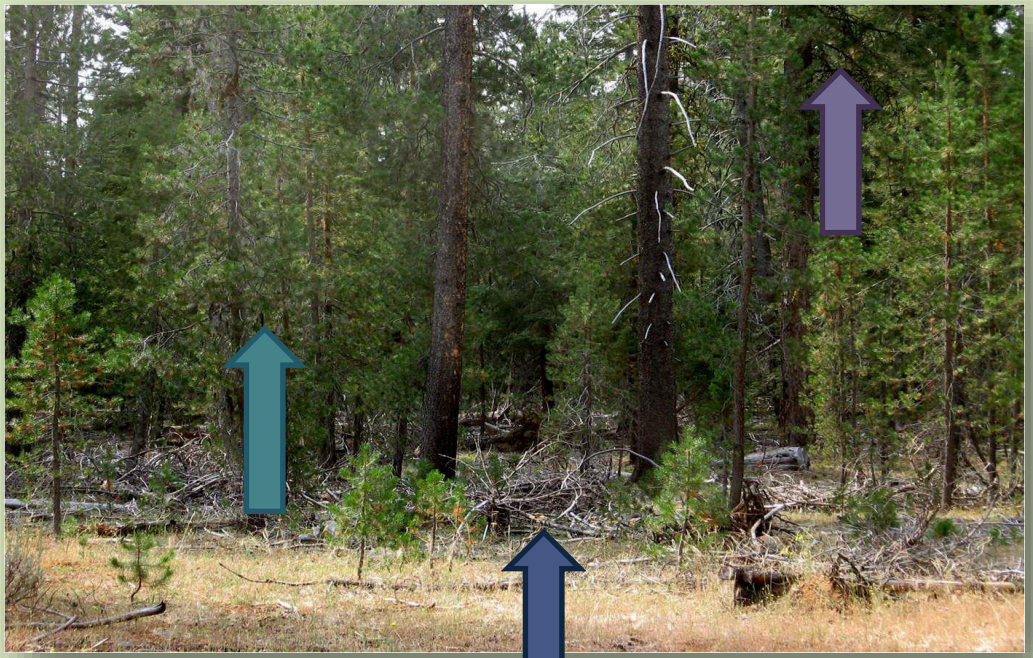


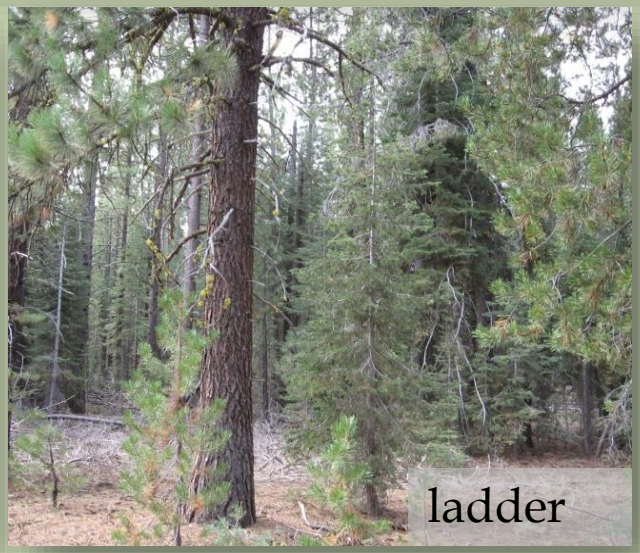
Fire Behavior

- Fire behavior is influenced by:
  - Fuels
  - Weather
  - Topography

- Fuel is the only factor that can be readily changed by management action

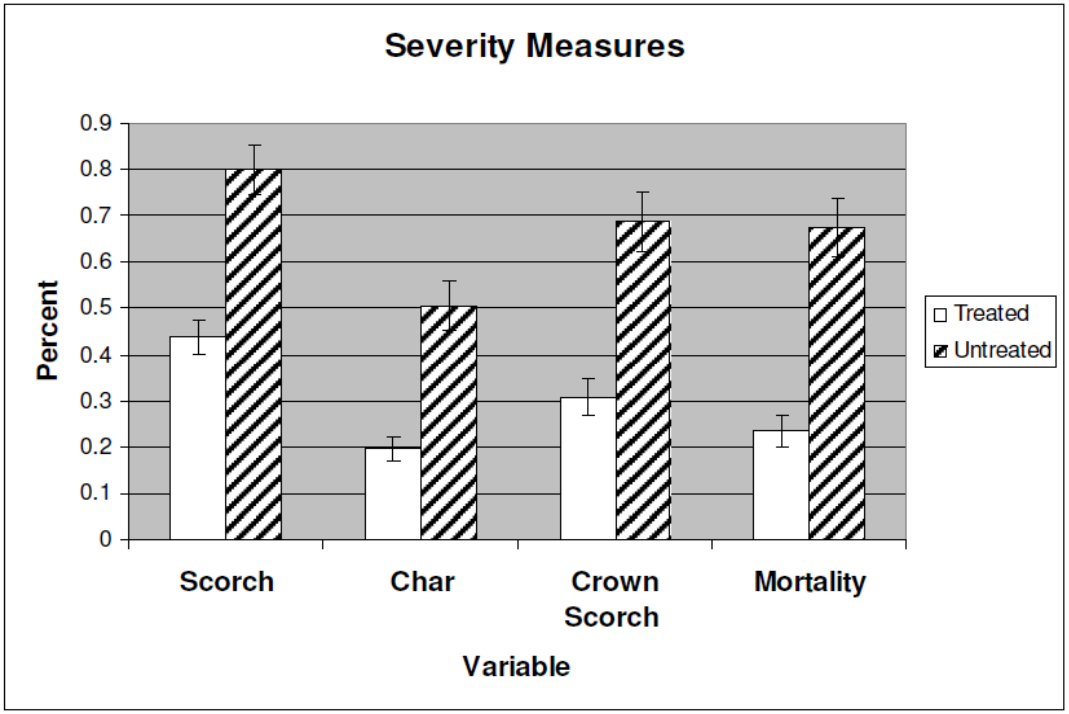
Fuels





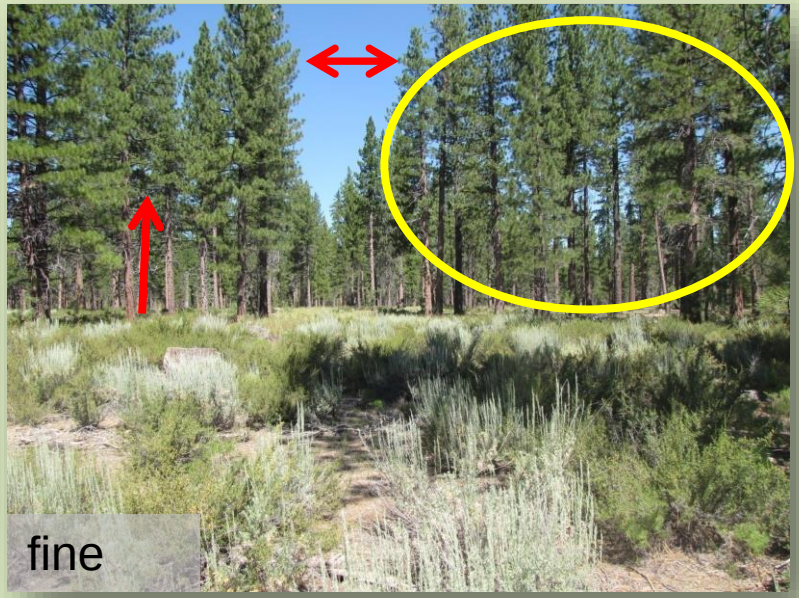
Differences in fire severity between treated and untreated areas

Figure 16. Percent char and scorch height, percent crown scorch, and percent mortality were significantly higher in untreated areas than within the Pittville DFPZ, (df=1,118, p<0.001, except for scorch height where p=0.008).



results of 20 wildfires that started in or entered a fuel treatment within the HFQLG Pilot Project area from 1999 through 2010.

Variable Density Thinning

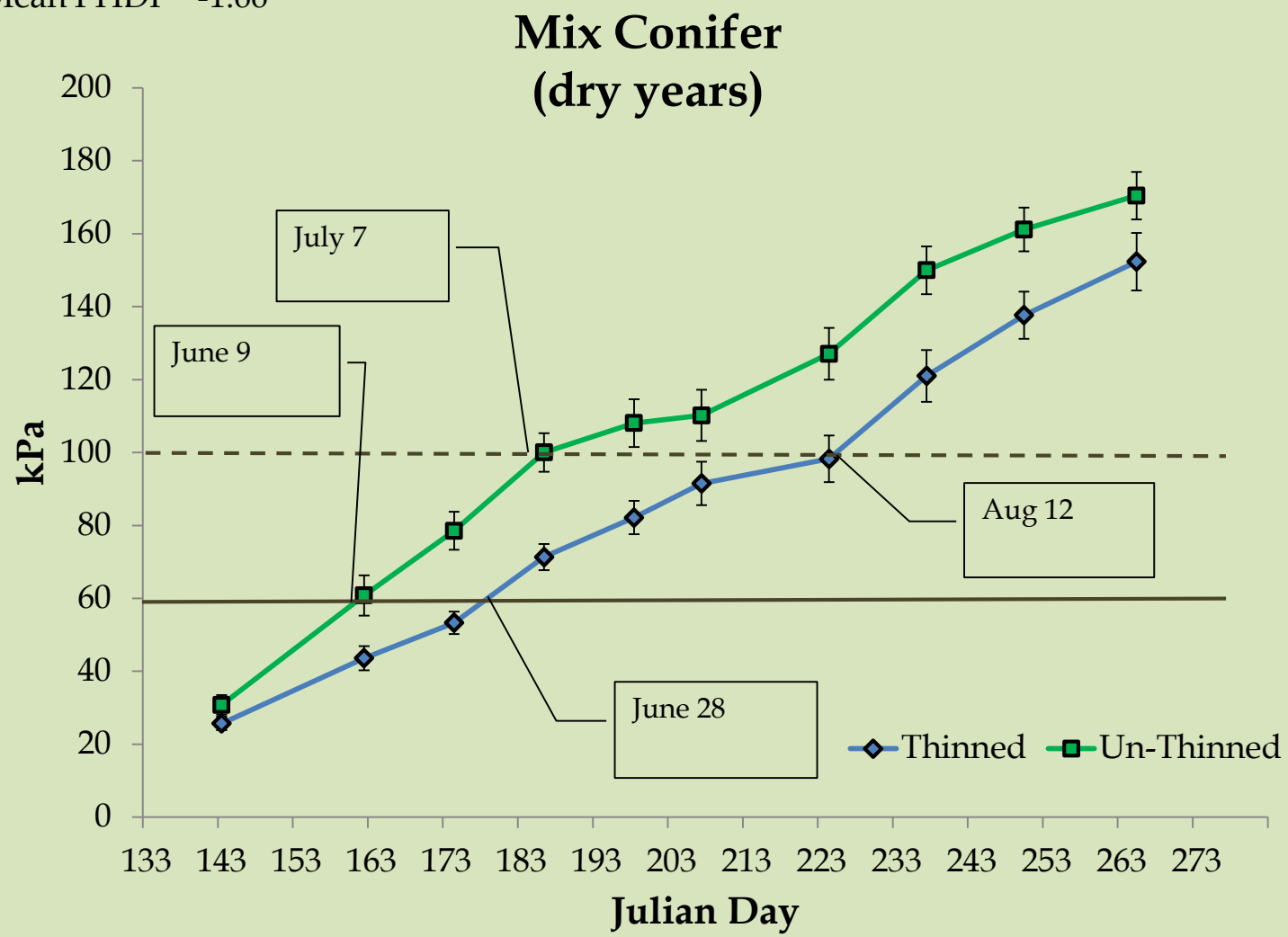


Key points:

- Use topographic position, aspect, and fire regime for basal area retention
- Maintain fire resistant trees
- Maintain a variety of size classes and different species
- Create different structural patterns - Forest cover will result in different amounts of intercept and retention of snow
- Reduce and break up the continuity of fuels – surface, ladder, and canopy
- Restore fire as process on the landscape

Soil moisture response

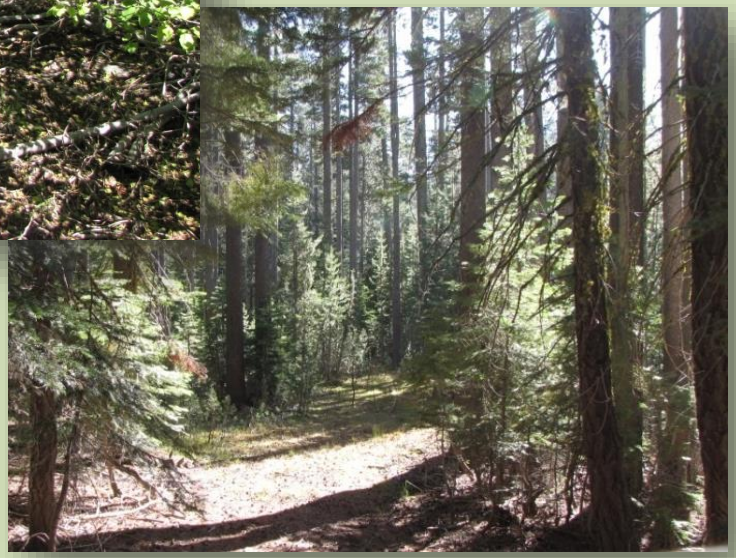
Mean PHDI = -1.66



Conifer densification in other communities

aspen

riparian



meadow

Landscape heterogeneity

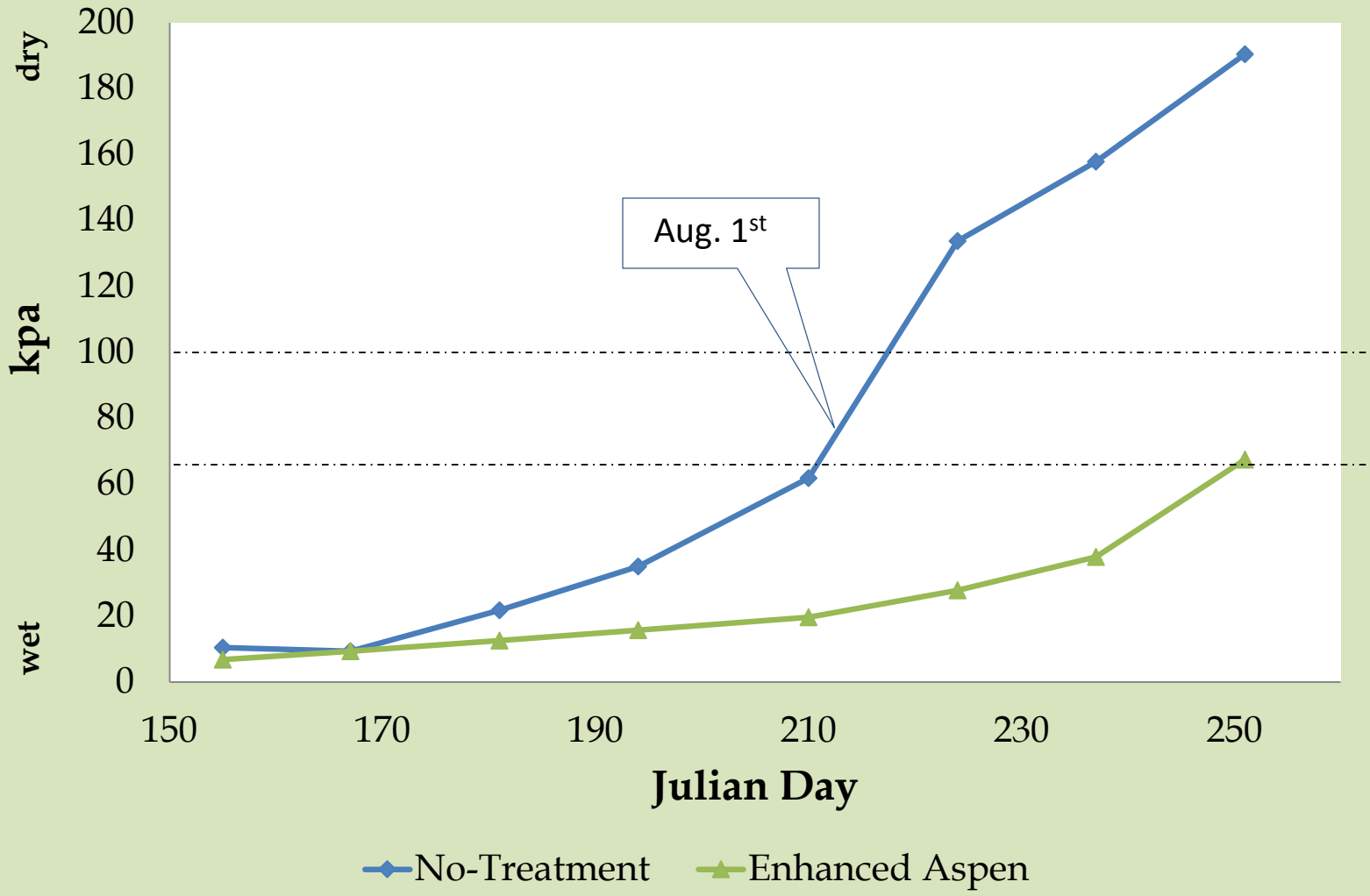
hardwoods

Pre-treatment

1st year post treatment

11th year post treatment

Soil moisture availability in enhanced aspen



Landscape heterogeneity

riparian

current riparian condition

immediately following treatment

less resilient to disturbance

6 years following implementation

Ingress and Egress

comparison of management activities

Hand thinning and pile burning

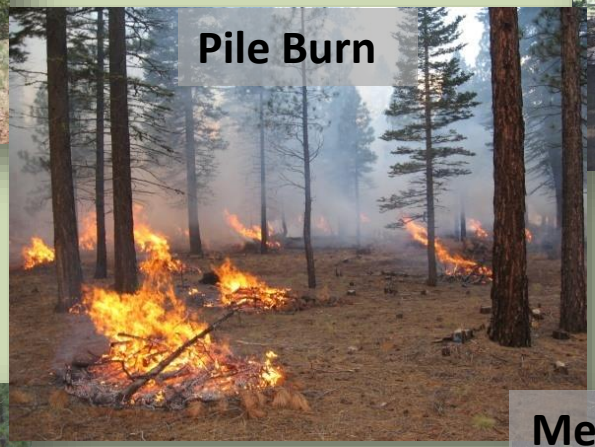
Ingress and Egress

comparison of management activities (cont)

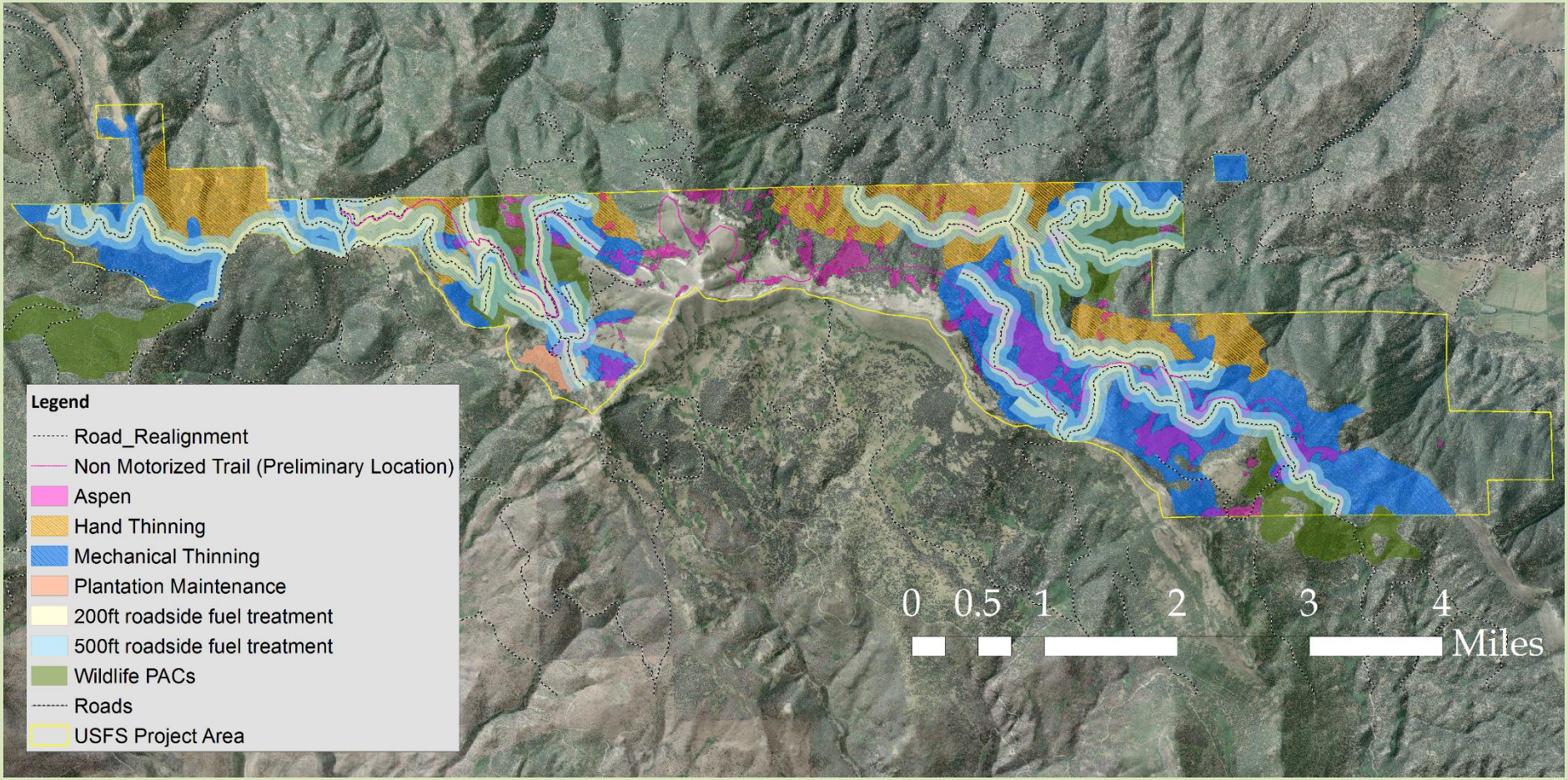
mastication,
hand-thinning,
and limbing

hand-thinning
and piling

Treatment Methods



Proposed Treatment Areas



Current Status (Entire Project Area = 8,195 acres)

Identified Treatments

1. 2,751 acres - Mechanical vegetation treatments

2. 1,403 acres - Hand or small equipment vegetation treatments

3. 263 acres – aspen outside of hand and mechanical treatments

4. 120 acres – Plantation Maintenance

5. 769 acres of fuel treatments 500 ft from access roads for ingress and egress (acres not included in other area treatments)
6. ~1.5 miles – road realignment

7. Recreation – non-motorized trail

Survey Progress

1. Stand exams for entire project area

2. Spotted owl surveys completed

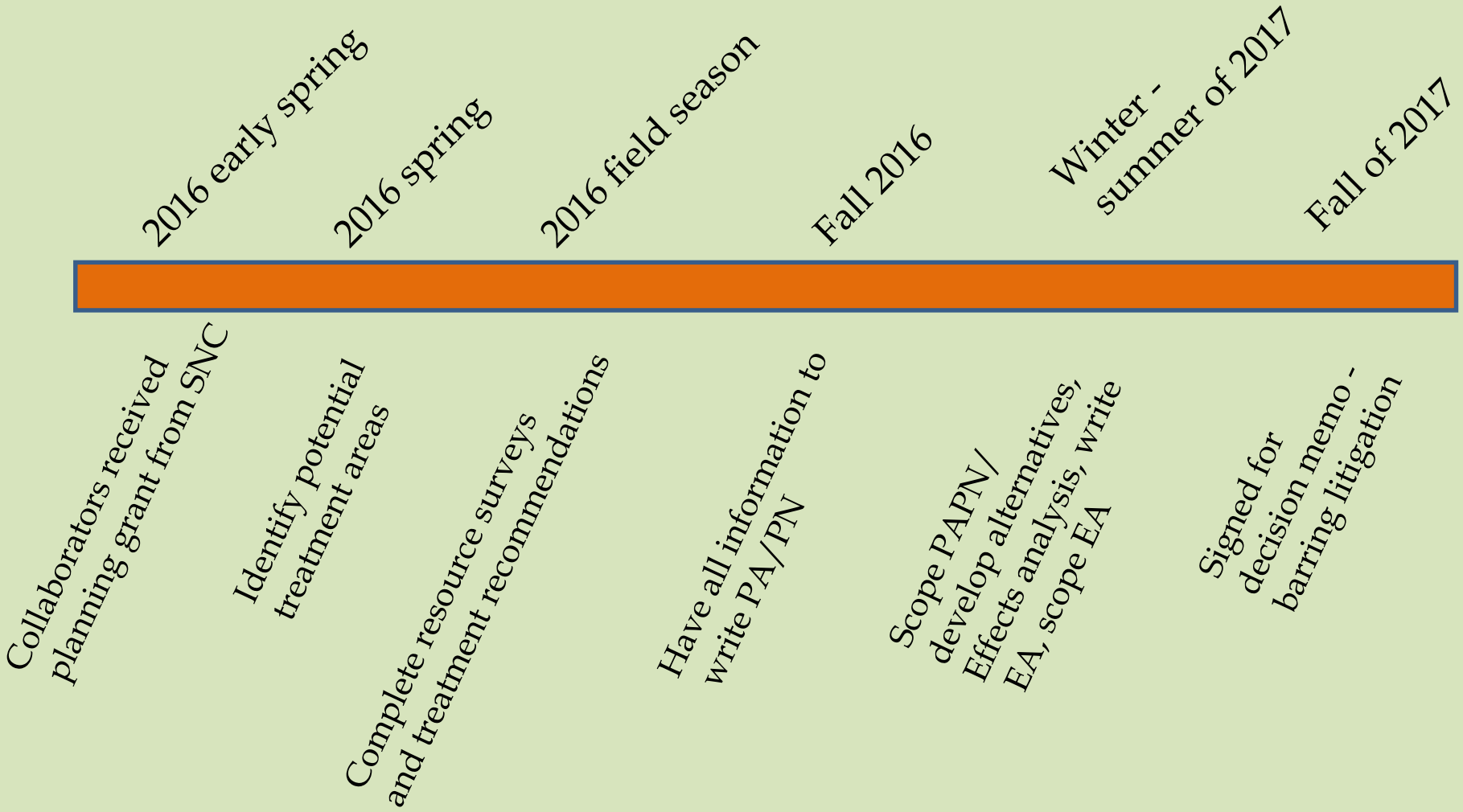
3. Archaeology surveys completed for ~80% of the area

4. Transportation - ~80% of the area

5. Forest Health Assessment - 2014

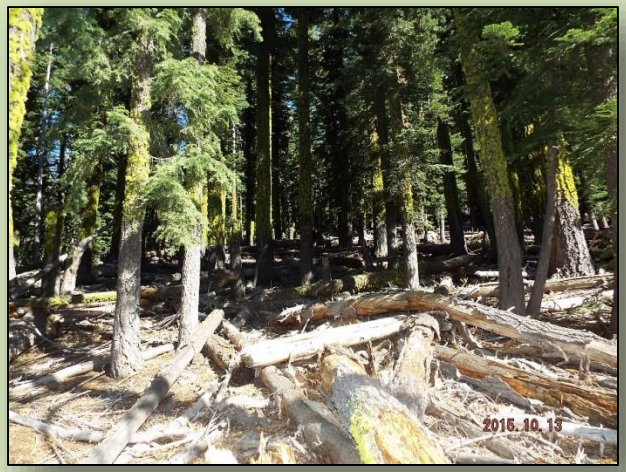
6. Other
    1. Botany
    2. Soils
    3. Hydrology
    4. Fuels
    5. Recreation
    6. Other wildlife

Proposed Timeline

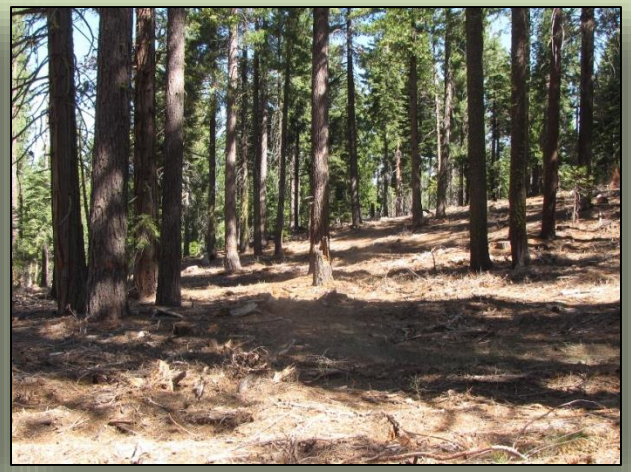


Conclusions

- Healthy conifer, hardwood, meadow and riparian ecosystems have the ability diffuse the spread and severity of wildfire.
- Forest structure influences snow accumulation and soil moisture availability which would offset drought effects.
- No action and subsequent wildfire would have worse ecological effects than action.



Existing



Potential (treated)

Potential (no treatment)