2010 Winter Edition **Fire Integration Project** Vol. 4 No. 1

A Newsletter from the SNAMP Public Participation Science Team - Volume 4, Number 1, Feb 2010

the Sierra Nevada Adaptive Management Project newsletter

In this newsletter, we summarize results from the **Fire Integration Project**, a joint effort between SNAMP and the US Forest Service Pacific Southwest Research Station. One goal of SNAMP is to integrate what we are learning at our specific research sites with similar efforts in the Sierra Nevada. By proactively expanding the focus to several research teams, we scientists improve both the credibility and relevance of our research. This study compares the performance of fuel management strategies currently being implemented on Forest Service lands in the Sierra Nevada using fire behavior modeling. The objective is to better understand how fuel management treatments are implemented in real landscapes, and if these treatments perform as theory predicts.

SNAMP Background

The Sierra Nevada Adaptive Management Project (SNAMP) is a joint effort by the University of California, state and federal agencies, and the public to study management of forest lands in the Sierra Nevada. Millions of acres of Sierra Nevada forest are endangered by wildfire. To address this problem, the US Forest Service is implementing vegetation management treatments in areas where fire risk is high. SNAMP is studying the effects of a vegetation treatment called SPLATs (Strategically Placed Area Treatments) on forest health, water quality, and wildlife within an integrative adaptive management framework.

The Fire Integration Project

Millions of acres of forest in the Sierra Nevada are at risk of catastrophic wildfire. Nearly a century of fire suppression has had the unintended consequence of altering the vegetation structure and composition of our forests, placing them at increased risk of large catastrophic wildfires. Although fire is a natural and important process in the Sierra Nevada, large catastrophic fires are not natural, and are detrimental to forest and ecosystem health. Reducing this elevated fire risk requires management actions to alter forest fuels and thereby change the behavior of wildfires. There are several proposed management strategies to modify fire behavior on the forest landscape. All of these strategies were designed using theoretical fire behavior models.

Fuel Management Treatments

We looked at three types of fuel management strategies: (1) Strategically Placed Area Treatment - SPLATs (Fig. 1); (2) Defensible Fuel Profile Zone (DFPZ) (Fig. 2); and (3) Uneven-aged management strategy (not shown; defined as the application of a combination of management actions that maintains several age-classes and tree sizes within a timber stand).

***Fig. 1*: Strategically Placed Area Treatment (SPLATs):** Thirty percent of the landscape is treated in strategically placed 20 – 200 acres blocks. The spatial pattern of the treated areas is designed to reduce rates of fire spread and reduce fire intensity at the head of the fire.

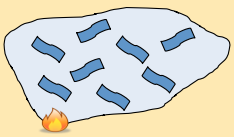
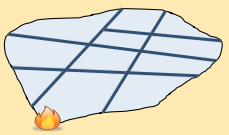
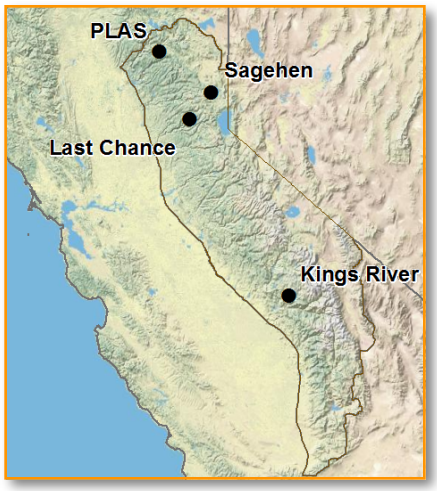


***Fig. 2:* Defensible Fuel Profile Zone (DFPZ):** Treatments are a network of interlocked landscape fuel breaks. DFPZs were designed to provide safe access for fire fighters, limit fire behavior to prescribed levels, and create conditions in which canopy fires are less likely to spread.





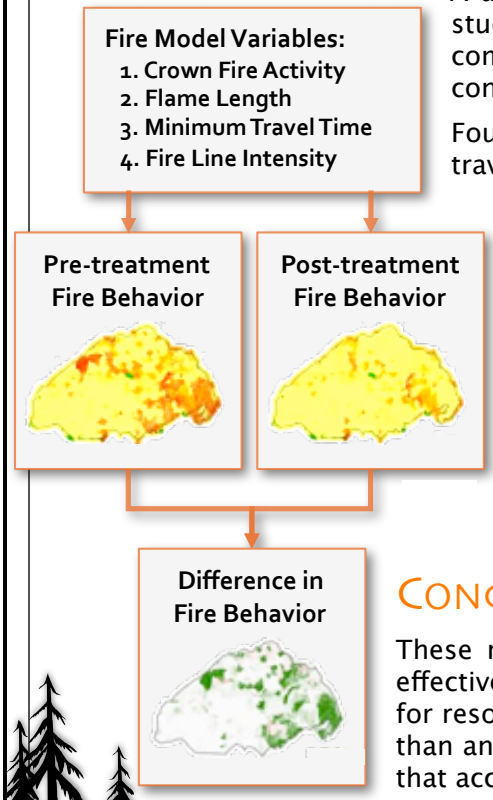
Study Areas

Four management projects were chosen for this study based on their data availability:

Sagehen Experimental Forest and the Last Chance SNAMP research site are implanting SPLAT treatments. The Plumas-Lassen Administrative Study (PLAS) has implemented DFPZ treatments. For comparison, we also included the Kings River Experimental Watershed where an uneven-aged management strategy is planned. The figure to the right provides detailed information on the location of each study area and the management prescription (Rx).

Site	Location	Treatment
PLAS	Northern Sierra Area (ha): 18,623 Elev.(ft): 3500 - 6900	DFPZ Rx (ha): 1,883 Rx %: 10%
Sagehen	East Side Area (ha): 3,979 Elev.(ft): 6200 - 8600	SPLAT Rx (ha): 1,391 Rx %: 35%
Last Chance	Northern Sierra Area (ha): 4,287 Elev.(ft): 2800 - 7100	SPLAT Rx (ha): 1,069 Rx %: 25%
Kings River	Southern Sierra Area (ha): 9,362 Elev.(ft): 1000 - 2700	ECOSIV Rx (ha): 1,419 Rx %: 15%

Fire Model



Modeling Approach

A uniform landscape level fire hazard assessment was conducted across all studies using FlamMap – a fire behavior mapping and analysis program that computes potential fire behavior characteristics over an entire landscape for constant weather and fuel moisture conditions.

Four major fire behavior outputs (crown fire activity, flame length, minimum travel time, and fire line intensity) were compared between pre- and post-treatment scenarios for two fire weather conditions.

Results

- All study areas had variations between conceptual prescriptions and actual implemented prescriptions
- The management strategies were all successful at changing fire behavior indicating that real-world SPLAT and DFPZ designs seem to work as predicted.
- The Last Chance SPLAT had the largest total impact on fire behavior distributions in both total and weighted measures

Conclusions

These results suggest that spatially coordinated landscape treatments can be effective in modifying fire behavior across the entire landscape. The implication for resource managers is that details of a specific strategy may be less important than an approach that recognizes the value of informed placement of treatments that account for local fuel characteristics, fire weather, and management goals.

Newsletter created by Shasta Ferranto, Sarah Lewis, Maggi Kelly, David Saah, & John Battles; images courtesy of David Saah and the Sierra Nevada Adaptive Management Project