

## **Case Study: Reds Meadow**

*Fuels, Fire safety, Windfallen trees, Recreation, Multiple agencies, and Bark beetles all in one*

Submitted by Michele Slaton

### **Location/Scale**

Reds Meadow Valley is located in the Middle Fork of the San Joaquin watershed on the Mammoth Ranger District of the Inyo National Forest. A broader project area was identified for a vulnerability assessment that includes Upper Middle and Middle Middle Forks of the San Joaquin River (6<sup>th</sup> field watersheds), and includes 49,769 acres, ranging from 5,346–13,143 ft. elevation, a large portion of which occurs in wilderness. Vegetation in the analysis area ranges from mixed conifer to red fir, mountain hemlock, lodgepole pine, whitebark pine, and alpine.

There has been a near absence of fire on the landscape over the last century. Prior to that, mean fire interval was 14-18 years, with the range of single fire intervals between 3 and 30 years (Caprio et al., 2006). The current fire return interval was recently calculated to be 96 years.

### **Focus**

Between Nov. 30 and Dec. 1, 2011, extreme winds caused a blowdown event, uprooting trees of various sizes, and resulting in large numbers of down trees in developed areas, near roads, and along trails in Reds Meadow Valley. A project is currently underway to remove windfallen trees from approximately 220 acres. Even prior to the windfall event, the INF was concerned about safety in Reds Meadow in the event of fire, because of heavy build-up of fuels, exclusion of fire for over a century, and a single entry and exit route into the valley. In addition, bark beetle damage has strongly impacted surrounding watersheds, and infestation has the potential to spread to Reds Meadow.

Reds Meadow Valley has been a prime focus area for scientific research related to landscape change over the last decade. Caprio et al. (2006) investigated changes in fire regime that have occurred in the valley, and Millar et al. (2012) described recent whitebark pine mortality in nearby areas in the context of a warming climate. Millar et al. (2006) have used evidence from tree rings and volcanic events to reconstruct past climates. As a result, there is an unusual wealth of vegetation and climate history information available for the area, which presumably may assist in constructing a range of future scenarios as the climate continues to warm.

The INF would like to develop a landscape scale assessment (ca. 50,000 acres) that identifies the most vulnerable units with respect to ecological function and public values, as well as potential actions that can be taken, in light of potential climate scenarios.

### **Scale/focus**

#### **Objective**

A fuels project is currently underway to remove windfallen trees from certain units in Reds Meadow. Our objective looking forward is to best plan actions that may be taken to assess the vulnerability of the current ecosystem given that:

- Fire safety is the priority in the planning process
- Many remaining trees are weakened
- Soils exposed from uprooted trees may be susceptible to further loss

- A world-class ski area (Mammoth Mt.) and National Monument (Devils Postpile) are within the broader project area, resulting in strong needs for public engagement throughout an assessment
- Significant areas of bark beetle damage have occurred in adjacent watersheds
- Projected climate scenarios may exacerbate many of the above factors

Questions: What is the rate and direction of ecological (e.g. vegetation) change expected in the valley? What actions can be taken and where, specifically? How do we adapt recreation use in the long-term to account for changes that are climatically driven or required for safety?

### **Status**

A NEPA analysis was conducted for the Reds Meadow fuels project which is currently underway. The INF may continue with a larger scale plan, directly related to fuels reduction and fire safety in the upcoming year(s). Current monitoring is underway regarding tree invasion into meadows, and changes in temperature and precipitation.

### **References**

Caprio, A.C, M Keifer, K Webster. 2006. Long-term effects of the 1992 Rainbow Fire, Devils Postpile National Monument, California. Third International Fire Ecology and Management Congress, Association for Fire Ecology, Nov. 13-17, 2006, San Diego, CA, 6 p. (extended abstract).

Millar, C.I., J.C. King, R.D. Westfall, H.A. Alden, and D.L. Delany. 2006. [Late Holocene forest dynamics, volcanism, and climate change at Whitewing Mountain and San Joaquin Ridge, Mono County, Sierra Nevada, CA, USA.](#) Quaternary Research 66 (2006): 273-287.

Millar, C., R.D. Westfall, D. Delany, M. Bokach, A. Flint, L. Flint. 2012. [Forest mortality in high-elevation whitebark pine \(\*Pinus albicaulis\*\) forests of eastern California, USA: Influence of environmental context, bark-beetles, climatic water deficit, and warming.](#) Canadian Journal of Forest Research. 42(4):749-765.