

Project Summary

Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: Rocky Mountain National Park Fuels Map Refinement

Discipline: Natural Resources
Type of Project: Technical Assistance
Funding Agency: National Park Service
Other Partners/Cooperators: Colorado State University
Effective Dates: 6/1/2012 - 6/30/2014
Funding Amount: \$9996

Investigators and Agency Representative:

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Project Abstract: In 2006 a workshop was held at Rocky Mountain National Park to develop a fuels map for the park. The existing vegetation map for the park (Salas et al. 2005) was used as a starting point for the development of the fuels map. Participants included park fire and resource management staff, Rocky Mountain Inventory and Monitoring Network staff, as well as interested individuals from US Forest Service and Colorado State Forest Service.

During the workshop, vegetation types were discussed and the group came to consensus on the assignment of the most appropriate Scott and Burgan (2005) standard fire behavior fuel model (see Table 1). Fuel model assignments were based on expert opinion, taking into consideration factors such as vegetation composition, canopy cover, and location within the park. The resulting vegetation type to fuel model crosswalk was used to develop a fuels data layer for the park and surrounding environs.

The fuels data layer was based on the best information available at the time. However, it does not account for the dramatic changes in fuels that have occurred following the unprecedented mountain pine beetle (MPB) outbreak nor does it incorporate any information on disturbance history in the park. Although not complete, the park now has detailed information on fire history within the subalpine zone (Sibold 2001, Buechling and Baker 2004, Sibold et al. 2006).

Disturbance history, particularly time since last stand replacing fire, can have a tremendous impact on fuel loading. For example, within the lodgepole pine vegetation types, dead and downed fuel loading can range from less than 1 ton/acre to over 70 tons/acre (e.g. Ottmar et al. 2000). These differences in fuel loading can have dramatic impacts on predicted and observed fire behavior as was experienced during the 2010 Cow Creek fire.

Colorado State University (Sibold) will refine the fuels map in the lodgepole pine forest type to include the impacts of past disturbance, including fire history and the recent MPB outbreak, on fuel loading. This will be accomplished through developing a spatially explicit model of MPB outbreak severity that will be combined with fire history (Sibold 2001, Buechling and Baker 2004, Sibold et al. 2006) and pre-MPB stand characteristics (available in ROMO GIS) to classify forest patches (e.g. old (>250 years post fire), moderate tree density, high MPB severity). In the field, forest patch classifications will be verified and forest fuels will be quantified for individual forest patch classes. Fuel load conditions will then be reincorporated into the forest patch classification layer to create the fuel loading layer. The spatial model of MPB outbreak severity will be developed based on relationships between stand characteristics and MPB mortality as well as previously collected data on severity with ROMO (Sibold unpublished data).

Outcomes with Completion Dates: June 1, 2012 to June 30, 2014 - A GIS data layer characterizing surface fuels throughout the park will be developed that incorporates our knowledge of past disturbance.

Keywords: fuels map, lodgepole pine, fuels history, Rocky Mountain National Park and Preserve, Colorado State University