

# Project Summary

## Rocky Mountains Cooperative Ecosystem Studies Unit

**Project Title:** Non-Native Plants in Burned Areas as a function of Burn Severity and Return Interval (using remote sensing and field methods)(early detection monitoring)

**Discipline:** Natural

**Type of Project:** Research

**Funding Agency:** National Park Service

**Other Partners/Cooperators:** University of Colorado at Boulder

**Effective Dates:** 9/15/2005 - 3/1/2009

**Funding Amount:** \$43,927

**Investigators and Agency Representative:**

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### Project Abstract:

This study by University of Colorado at Boulder investigators proposes to assess the degree to which non-native invasive species have colonized burned areas in Yosemite National Park, and what relationship exists between burn intensity and invasion. Secondly, use of remotely sensed data can be a time-saving tool in assessing ecosystem conditions, and this study will address whether remote sensing can provide adequate information about non-native invasive species invasion to be used to monitor and predict invasion dynamics in post-disturbance systems. This project is being sponsored by the Sierra Nevada I&M network, and will be coordinated with the national I&M program.

Methods will include a combination of ground-truth field data collection on non-native species composition in ecosystems with varying degrees of burn intensity and frequency, coupled with remotely sensed imagery analysis to determine how much of the ground information is reflected in the remote sensing data. A GIS environment will be used to compare burn maps with data collected on non-native invasive species colonization and other landscape variables that may be of use in explaining/predicting non-native invasive species invasions. Further, a final product of the study will be protocols and monitoring methods that may be of use in early detection of non-native invasive invasion problems, and applicable to more remote sites including wilderness.

This project is being conducted in at the same time as a broader cooperative effort of the national NPS Invasive Species Monitoring Program and NASA Goddard Space Flight Center entitled "Using NASA's Invasives Species Forecasting System to support National Park Service decisions on fire management activities and invasive plant species control. In turn, this effort is relying on a joint NPS/USGS "Invasive Species Forecasting System" (ISFS) habitat modeling system that has been developed.

### Outcomes with Completion Dates:

1. Examination of colonization by non-native species of burned areas in wilderness. Sept. 2006.
2. Comparison of invasive plant species composition at sites with different levels of burn severity (high, moderate, and low) (using newly available burn severity maps - circa 2005). Nov. 2006.
3. Comparison of non-native plant species composition over time at areas that have experienced varying burn severities and burn intervals. March 2007.
4. Determination of ways remote sensing can be used as a tool to both monitor and identify non-native species presence in large, remote burned areas. May 2007.
5. Prediction of presence/absence of non-native species in areas that have experienced fires of varying severity and frequency. May 2007.
6. Conceptual model of invasive plant species distribution, due July 31, 2007
7. Development of a protocol and preliminary data for examining fire severity and invasive species over time, Sept. 2007.
8. Determination if remote sensing can be used as a tool to identify and monitor non-native plant invasions of burned areas in wilderness; and, if so, incorporate into protocol with #7, above. Nov. 2007.
9. Development of monitoring tools and methods for early detection of non-native plants in burned areas in SIEN. March 2008.
10. Development of a monitoring protocol that could be useful to other I&M networks. Said methods, tools, and monitoring protocol, listed in #s 7 and 9 above, will follow guidelines in Oakley et al. (2003). May 2008.

Citation: Oakley, K.L. L.P. Thomas, and S.G. Fancy. 2003. Guidelines for long-term monitoring protocols. Wild. Soc. Bull. 31(4):1000-1003

**Keywords:** non-native plants, burned areas, burn severity, return interval, Yosemite National Park, Sierra Nevada Inventory and Monitoring Network, vital signs monitoring protocols, University of Colorado at Boulder

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Date Annual Report Received:

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Publications, etc. on file: