

Project Summary

Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: Spatial Analysis of the Influence of Fire Severity on Forest Structure on the North Rim of the Grand Canyon National Park using LiDAR and CBI corrected MTBS data

Type of Project: Research
Discipline: Natural Resources
Funding Agency: National Park Service
Other Partners/Cooperators: University of Montana
Student Involvement: Yes, MS student
Effective Dates: 5/1/2015 - 11/30/2016
Funding Amount: \$59,292

Investigators and Agency Representative:

NPS Contact: Ronda Newton, Grand Canyon NP, 1824 S Thompson St, Flagstaff, AZ 86001; 928.638.7492; ronda_newton@nps.gov

Investigator: Valenijn Hoff, Research Associate, The University of Montana, 32 Campus Drive, Missoula, MT 59812; 406.243.6777, valentijn.hoff@firecenter.umt.edu

Queen, Lloyd,

Project Abstract:

The proposed research supports the GRCA Fire Management goal of using the best-available scientific information to restore and maintain park ecosystems in a natural, resilient state. In addition, the proposed research addresses three of the four FMLB priority areas in that it provides further information to inform the park's 5-year fuel treatment plan, provides data critical in the decision-making process for managing wildfires for resource objectives, and evaluates fuel treatment lifespan and effectiveness.

The current GRCA 5-year fuel treatment plan for the North Rim includes approximately 25,000 acres of prescribed fire in unburned forests and no prescribed fire in previously burned forests. In addition, the North Rim area of Grand Canyon National Park has an average of 13 lightning-ignited wildfires per year. The options of when to recommend wildfires for long-term management and where to locate future prescribed fire treatments incorporate a number of decision factors, including fire history and severity in and around the areas being evaluated. The degree to which past fires influence the behavior and effects of current and future fires depends, in part, on time since fire and the severity of past fires. However, very little quantitative information is available to help GRCA fire managers determine how forest structure and fuel conditions change with time in areas that have burned with a variety of severity effects.

The proposed research will provide landscape-scale information on the lifespan and effectiveness of past fuel treatments by quantifying forest structure and fuel metrics that will enable more robust fire behavior modeling. This fire modeling can then be used to evaluate and, if necessary, adjust the current 5-year fuel treatment plan. In addition, the proposed research will develop a map of fire activity potential based on time since fire and fire severity that will enable fire managers to make more informed decisions on strategic and tactical approaches to managing wildfires. These more informed decisions will result in healthier and more resilient forests, which benefit the public over time.

Outcomes with Completion Dates: November 30, 2016

Keywords: spatial models, fire severity, forest structures, LiDAR and CBI corrected MTBS data, Grand Canyon National Park, University of Montana, National Center for Landscape Fire Analysis (NCLFA)