



Can wildland fire use (WFU) restore historical fire regimes in wilderness and other unroaded lands?

Project Summary

JFSP 2004 Principal Investigator Workshop

Project Title: Can wildland fire use (WFU) restore historical fire regimes in wilderness and other unroaded lands?

Project Location: Five study areas: Selway-Bitterroot Wilderness (ID/MT), Gila Wilderness (NM), Yosemite National Park (CA), Sequoia-Kings Canyon National Park (CA), Great Smoky Mountains National Park (NC/TN).

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Description of Project: Unroaded areas provide unique opportunities for applying wildland fire use (WFU) as a fuels management strategy and as a method for restoring historical fire regimes. This project develops an approach to assess the feasibility of WFU as a strategy for restoring historical fire regimes in wilderness and on other unroaded lands. The information developed by this project is directly supporting the development of fire management plans. We are using 5 wilderness areas and national parks as study areas to develop our analysis approach. We are determining where WFU can be considered given the current conditions of fuels in the study area and the risks to ecological and social values both within and outside the wilderness or park. In areas where a WFU program can be considered, we are assessing the availability of natural ignitions for restoring historical fire regimes and proposing management options for those areas where natural ignitions are insufficient for accomplishing management objectives. We are conducting site visits to each study area so that fire management staff can provide input and feedback on the GIS maps and WFU zone delineation in the form of expert knowledge.

Status Report: Since our previous report in March 2003, we finalized our study areas, met with management staff, and obtained all necessary data for our analyses for all 5 sites: the Selway-Bitterroot Wilderness in Idaho/Montana, the Gila Wilderness in New Mexico, Yosemite and Sequoia-Kings Canyon National Parks in California, and Great Smoky Mountains National Park (GRSM) in Tennessee/North Carolina. The addition of GRSM was a direct response to the Governing Board's request to include a study area in the eastern US. This is a particularly interesting study area because, unlike our other study areas, GRSM has two fire seasons with two different fuel conditions (leaf-on and leaf-off). To accommodate these two seasons, we will perform two separate sets of analyses for GRSM. (In addition to these formal study areas, we have two "ad hoc" study areas where portions of our approach have been used. The first is the Bitterroot National Forest, adjacent to the Selway-Bitterroot Wilderness. The second is the Cloud Peak Wilderness in Wyoming, where, in response to a request from fire management staff, we experimentally released a development version of the BurnPro model and preliminary documentation of our procedures.)

We spent several months this year improving and testing the model BurnPro, whose output is central to the project. BurnPro estimates the annual probability of burning for every pixel on a landscape and is used in our risk analyses as well as to assess the feasibility of restoring historical fire regimes with natural ignitions. We corrected logical inconsistencies regarding the assumed direction of fire spread and whether the rate of spread refers to heading, flanking, or backing fires. We also corrected a logical fallacy in the assumed timing of the fire season for areas on the landscape with very short fire seasons (e.g., high elevations with a fire season <30 days). In addition, we modified the model so that it now can account for fire-stopping precipitation events that may occur before the actual end of the fire season. We are satisfied that these improvements are sufficient to meet the project objectives but we plan to conduct an additional model validation exercise to compare results from "Monte Carlo" simulations of FARSITE (previously done elsewhere by Finney) with BurnPro results. This comparison should help us loosely define confidence intervals for our analyses.

We have completed analyses for Sequoia-Kings Canyon National Park, the Selway-Bitterroot Wilderness, and the Gila Wilderness and are beginning our analyses for Yosemite and GRSM. Analyses for Sequoia-Kings Canyon National Park were presented at the 2nd International Wildland Fire Ecology and Fire Management Congress in November. Our GIS analyst has been invited to present the model BurnPro and related analyses in a special session at the

American Society for Photogrammetry and Remote Sensing in May 2004. Final reports for each study area will be prepared in June 2004. By leveraging results from this project with support from the National Fire Plan, we hope to produce and release a user-friendly version of BurnPro in FY 2005 for use by the fire and fuels management community.

Issues/Concerns affecting the project: The project is within budget and will be completed by July 1, 2004. We experienced slower than expected progress last summer as we were improving and correcting problems with the original implementation of the model BurnPro, whose output is central to the project. As such, the Board has graciously granted us an extension until July 1, 2004.

For more information contact: Carol Miller, 406-542-4198, cmiller04@fs.fed.us
Visit our website: <http://leopold.wilderness.net/research/fprojects/F002.htm>.

Fire Research at the Aldo Leopold Wilderness Research Institute

The Aldo Leopold Wilderness Research Institute is helping managers devise effective strategies for managing fire and fuels across the full spectrum of lands extending from wilderness outward to the wildland urban interface. Our research encompasses the ecological and social sciences and is focused on three areas: 1) understanding natural fire regimes and their alteration by management, 2) developing information and tools to improve fire and fuel management planning, and 3) anticipating consequences of management alternatives.

For a complete list of fire-related research activities at the Leopold Institute, visit <http://leopold.wilderness.net/research/fire.htm>

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Leopold Institute

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