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Maintenance of Restored Forest Landscapes: Taking the Long View

Management Implications

Results of this research will provide:

- Long-term planning tools applicable to similar restored ecosystems across the interior West.
- A versatile modeling framework that can compare alternative scenarios to help predict future forest conditions.
- A realistic, reliable and quantitative assessment of management options that takes into account the uncertainties associated with alternative approaches.

Most forests in the American Southwest have been altered during the last 150 years due to a combination of livestock grazing, logging and fire suppression. Restoration of these forests involves recreating the processes and conditions that maintained forest health and sustainability prior to the changes brought by Euro-American settlement. Restoration treatments include thinning of dense stands, reestablishing understory plant communities and reintroducing low-intensity surface fire.

Forest restoration is a relatively new science. A fundamental problem facing managers in this century is how to plan for sustainable long-term management of restored forest ecosystems. Challenges include maintaining the effectiveness of treatments, scheduling future actions, estimating future costs and benefits and accounting for future uncertainties.

In order for traditional management tools to be effective in the long term they need to be applied in a broader context that includes logistical constraints, carbon and nutrient cycles, and climate variability. Carbon and climate issues are of growing concern and global carbon management practices are developing rapidly. In addition, more information is needed regarding how tree growth on restored landscapes will affect forest structure over time so that the effects of different schedules of restoration methods can be predicted.

Peter Fulé and W. Wallace Covington of Northern Arizona University and Jason Kaye of Pennsylvania State University will compare methods and schedules for long term maintenance of restoration treatments in the Mt. Trumbull study area in the Grand Canyon-Parashant National Monument with funding from the Joint Fire Science Program. Through ongoing collaboration between Northern Arizona University, Arizona Fish & Game Department and the BLM, the project will address several key, long term management questions such as;

- how to maintain treatment benefits over time with the greatest cost efficiency,
- the role of wood products in reducing recovery costs,
- the effects of alternative burn schedules,
- whether or not treated areas will absorb or generate carbon in the long term.



Mt.Trumbull Prescribed Burn



Mt.Trumbull post treatment

The Mt. Trumbull area presents unique opportunities for researching long term effects of various restoration scenarios on a landscape scale, as it is a deliberately designed ecological restoration experiment based on extensive study of historical forest patterns and processes. Controlled and monitored since 1995, Mt. Trumbull is a real project with the work completed on the ground. Investigators and managers collaborating on this research have substantial experience with fire mortality, drought effects, treatment costs and logistical constraints that will provide a realistic base for modeling. They have worked together for over a decade carrying out thinning, burning and reseedling on approximately 5000 acres of the Mt. Trumbull site.

Data from these restored landscapes will be applied to existing models that will inform effective long-term management strategies in an expanded context. Integration of both statistical and process models will forecast changes in tree structure, biomass, potential forest products, carbon and nutrients. Varying treatment and scheduling scenarios will be evaluated and climate variations will be taken into account.

Results will give managers a quantitative method for determining the accuracy of forecasts that will be applicable in many locations, as the project is located at the interface of the Southwest and the Great Basin regions. All scenarios will be developed in collaboration with BLM management staff to ensure they are relevant and feasible in terms of costs and other constraints. Technical guidance will be provided for managers via a customized instructional web package explaining proper use of the models for treatment maintenance planning.

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