

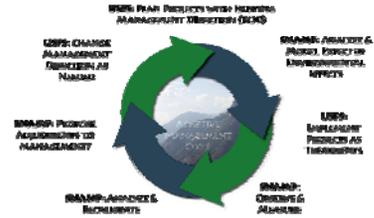
Introduction

The Sierra Nevada Adaptive Management Program is a research project developed at the request of federal and state resource agencies. These agencies agreed, formalized in a Memorandum of Understanding (signed Feb 2005), to work together to design and apply a multiparty adaptive management and monitoring system consistent with the Sierra Nevada Forest Plan Amendment. A team of UC researchers has worked with the agencies and the interested public to develop this adaptive management system to understand ecosystem behavior, to incorporate stakeholder participation, and thus to inform the implementation of adaptive management for Forest Service lands in the Sierra Nevada of California. The necessary experiments are extensive in both temporal (8 years) and spatial scale (20,000 ha). The project was launched May 1, 2007. Details on the workplan, the qualifications of the collaborating researchers, the process used to develop the plan, and progress to date can be accessed on our website: <http://snamp.cnr.berkeley.edu>.

Adaptive Management Framework



This project is built on the framework of active adaptive management. This joint research effort is designed to measure physical and natural processes at the relevant management scale. Research teams have been formed to study the ecosystem and management parameters of fire, forest ecosystem health, water quantity and quality, wildlife (focusing on two key indicator species – Pacific Fisher and California Spotted Owl), and public participation of stakeholders in the management decision making process.



The adaptive management process can be thought of as a feedback loop in which science can provide data to inform management decisions so that management direction can be adjusted as needed.

<http://snamp.cnr.berkeley.edu>

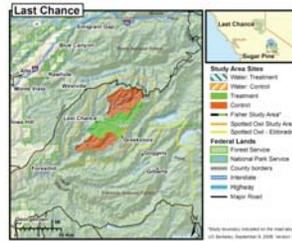
the SIERRA NEVADA Adaptive Management Project

Study Design

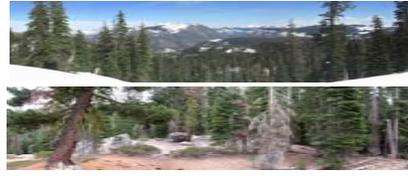
The study is designed to collect data using a BACI approach (Before and After treatment data collection in Control and Impact sites). It is designed to last seven years and includes:

- 2 years of pre-project data collection
- 2 years of implementation and data collection
- 1 year of ecosystem recovery and data collection
- 2 years of post-project data collection

Unlike traditional paired watershed studies where statistical comparisons or traditional hypothesis testing is employed, we will measure the support in the data for our a priori expectations. Our approach relies on both empirical data and mechanistic models.



The Last Chance site is located in the north-central Sierra Nevada on the Tahoe National Forest in Placer County. The Sugar Pine site is located to the south on the Sierra National Forest in Madera County.



Memorandum of Understanding Partners

A consortium of federal and state natural resource agencies asked the University of California Science Team to take on this third party role in Sierra forest management. Our partners are:
US Forest Service; CA Departments of Fish & Game, Water Resources, Forestry and Fire Protection; and US Fish and Wildlife Service

Pre-treatment accomplishments

Fuel treatments have not been implemented yet on the SNAMP study sites. Even though SNAMP is still in its pre-treatment data collection phase, the teams have accomplished much. Here are just a few examples:

- ~1000 people have attended 79 public SNAMP events.
- Fire modeling for the Last Chance site has shown that the planned treatments are effective at substantially reducing fire size and conditional burn probabilities.
- 60 Pacific fishers have been tracked with aerial telemetry – data is being collected on movements, survival and reproduction. Main causes of death so far are predation, roadkill, & disease.
- Meta-analysis of 4 sites in the Sierra shows that two different real world landscape-scale fuel treatment designs (SPLAT and DFPZ) both reduced modeled fire behavior as expected.
- SNAMP Spotted Owl research has expanded to include portions of Eldorado National Forest. 44 territories are now being monitored to assess the effects of SPLATs on occupancy, survival, and reproduction.
- The Water science team is using an innovative research design to collect distributed soil moisture and snow depth data. Detailed measures of terrestrial, meteorological, and other hydrologic data will be used to scale results up to a fireshed level.
- Multiple return LIDAR imagery has been acquired for both sites. These data will be used for highly precise forest measurements. Some of these include: DEM, canopy cover, tree height, canopy bulk density, DBH, LAI, and canopy fuel.

Public Participation

The Public Participation team will study the USFS public participation processes, working to increase stakeholder involvement in the project through regular open meetings and reporting, a website, and joint monitoring programs. Dr. Lynn Huntsinger (UC Berkeley) is the lead investigator; Kimberly Rodrigues (UC Cooperative Extension) leads team efforts in public participation and strategic facilitation; Dr. Maggi Kelly (UC Berkeley) leads team efforts in public participation through media, internet discussion, and WebGIS; Anne Lombardo is our Program Representative in the southern site; and Dr. Adriana Sulak (UC Berkeley) concentrates on SNAMP program analysis and public participation research at field sites. Shasta Ferranto Ph.D. Student (UC Berkeley) maintains the internet discussion and WebGIS.

Water

Water team members research water quality and quantity across treatment and control catchments prior to, and after, treatments. Dr. Roger Bales and Dr. Martha Conklin (UC Merced) lead the water research and monitoring activities. They are joined by Sarah Martin, a Ph.D. Student at UC Merced, and Matt Meadows, staff hydrologist.

Spatial

Dr. Maggi Kelly (UC Berkeley) and Dr. Qinghua Guo (UC Merced) lead this team, which also includes Marek Jakubowski, Ph.D. Student (UCB), and Hong Yu, Research Associate (UCM). They have responsibility for supporting all other teams' GIS, remote sensing and spatial analysis needs.

Fire & Forest Health

The Fire and Forest Health Team will investigate effects of strategic fuel treatments on fire behavior, tree morbidity and mortality, and forest health. Dr. Scott Stephens and Dr. John Battles at UC Berkeley lead the research and monitoring activities. Gary Roller, M.S. is the project manager for the team, and Post-Docs Dr. Brandon Collins and Dr. Adrian Das at UC Berkeley are also a part of the team.

Wildlife

The wildlife team focuses on two species: the Pacific Fisher (*Martes pennanti*), and the California Spotted Owl (*Strix occidentalis*). Both groups will research their target species through the life of the SNAMP project. Dr. Reginald Barrett (UC Berkeley) leads research and monitoring activities to investigate the status of CA fisher populations in the southern site. Dr. Rick Sweitzer is project manager for the Fisher research. Dr. Rocky J. Gutiérrez (University of Minnesota) leads Spotted Owl research and monitoring activities. Dr. Doug Tempel (University of Minnesota) is the Program Manager for the owl research.

SNAMP Research Teams