Plumas Lassen Administrative Study

2006 Annual Report

Research Modules

- Fire and Fuels
- Vegetation
- California spotted owls
- Small mammal community
- Terrestrial bird community

What is Adaptive Management?

- Overused/Misused term
- Many different definitions
- Hollings and Walter developed the concept in 1970s
- “experiment to learn the boundaries of natural systems”
- Walters (1986) outlined the adaptive management as beginning "with the central tenent that management involves a continual learning process”

Difficult to Implement Adaptive Management on Large Landscapes

- Many diverse activities/objectives
- Spatial heterogeneity of large geographic areas
- Complex, “noisy” systems
- Gradient of types of AM:
  - Active → Passive

Active	Passive
Science driven	Management objectives
Simultaneous test of alternatives (in parallel)	Single management hypothesis (in series)
Stronger inferences	Weaker inferences to “cause and effect”

Related Research throughout the Sierra Nevada; Meta-replication

- Emerging View
- Combination of data from multiple sources.
- The possibility for meta-replication already exists in the Sierra Nevada for several of the questions we are charged to address.

Metareplication Douglas Johnson (JWM 2002)

- Metareplication involves the replication of *studies* with similar research questions using different sites; methodologies; investigators and even years;
  - Reduces the chance that some artifact of time or place caused the observed results
  - Robustness of numerous independent studies
- Use the principles of experimental design for each study as much as possible (controls, randomization, replication)
- However, Science is safeguarded by repeated studies to ascertain what is real and what is a spurious result of an individual study

Related Research in the Sierra Nevada: Fire/Fuels/Vegetation/Forest Ecology

- Blacks Mt.
- Sagehen
- Lake Tahoe basin
- Blodgett
- Sierra Nevada Adaptive Management (UC collaboration)
  - American River
  - Fish Camp
- Kings River
- Teakettle

Related Research in the Sierra Nevada: CA spotted owls

- American River
  - Canopy cover study
  - SNAMP
- Eldorado
  - Demographic study
  - Canopy cover study
- Sierra National Forest
- Sequoia National Park

Related Research in the Sierra Nevada: Small Mammals

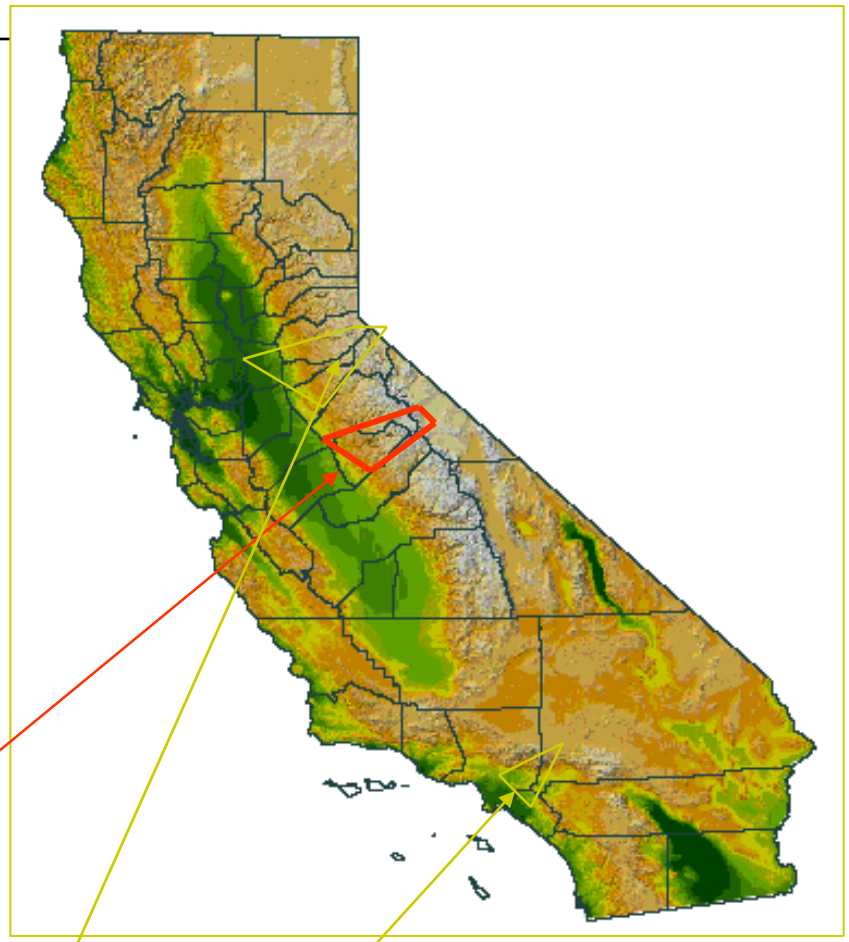
- Sagehen
- Lake Tahoe basin
- Blodgett
- Teakettle

Related Research in the Sierra Nevada: Terrestrial Birds

- Blacks Mt.
- Lassen
- Lake Tahoe basin
- Blodgett
- Kings River
- Many other locations

Other Related Programs

The **National Ecological Observatory Network (NEON)** will be the first national ecological measurement and observation system designed both to answer regional- to continental-scale scientific questions and to have the interdisciplinary participation necessary to achieve credible ecological forecasting and prediction.



Projected location for California NEON sites

Other potential locations for sites

Data Analysis

- In formal estimates of management effects we take a likelihood approach to evaluating results (Edwards 1992). Instead of the traditional hypothesis testing, we measure the support in the data for our a priori expectations (i.e., models).
- This analytical approach provides more intuitive answers to stakeholders' concerns. For cases where we have competing models to explain the observed responses, we will use approaches based on information theory (e.g., Akaike's information criterion) to quantify the strength of evidence for alternative models.

Create more robust understanding through synthesis of numerous studies

- Collaboration with many scientists
- Overcome experimental design constraints at large spatial scales
- Use of contemporary analytical methods
- All of this leading to:
  - an updated understanding of ecosystem function and process and response to management actions
  - Scientifically founded guidance for land management planning and practices