Tahoe National Forest Adaptation Case Study

A Toolkit for Adapting to Climate Change on Western National Forests: Incorporating Climate into Resource Management and Planning

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The Need for Science-Management Partnership

- Climate-change science has not been delivered effectively to public land managers.
- Must scale down science so it is operational at the forest level.
- Are routine management approaches compatible with climate change?

Purpose

- Incorporate climate change considerations into decision making process by developing decision support tools

Audience

- National Forest System land managers on multiple levels
- Toolkit will be broadly relevant to other managers, policy makers, and scientists

Tahoe Case Study

- Collaborations with managers have resulted in the:

  1) Development of a tool to screen projects for climate-change implications

  2) Analysis of compatibility of management direction with climate change

  3) Addressing uncertainty and risk in the Land Management Plan (LMP) revision and process

Product 1: Climate Project Screening Tool

- **Purpose:** Provide a screen for whether climate change considerations have been incorporated into project planning
- **Procedure:** Developed in collaboration with Tahoe NF managers and the Region
- **Product:** Series of broad questions, categorized by typical project types, for interdisciplinary teams to discuss during the project planning phase
- **Goal:** Stimulate and expand discussions on project development. Also provides a way to document any climate change analysis and related decisions that were made for NEPA.

Project Activity	Climate Change Trends and Local Impacts	Key Questions for Managers	Response Narrative (please complete)	Continue with Project?
Thinning for Fuels Management Project: Thinning for fuels reduction project	**Trends -** Increased fuel buildup and risk of uncharacteristically severe and widespread forest fire; longer fire seasons; higher elevation insect, disease, and wildfire events; increased interannual variability in precipitation, leading to fuels build up and causing additional forest stress; increased water temperatures in rivers and lakes and lower water levels in late summer; increased stress to forests during periodic multi-year droughts; decrease in water quality from increased sedimentation **Local Impacts –** Increased risk for erratic fire behavior; decreased window of opportunity for prescribed fire conditions; increased risk of fire spread in high elevation areas; flashier, drier fuels; decreased water storage in soils	□Will the projected density of the stand after it has been thinned be able to withstand erratic and severe wildfire events, given the projected increase in forest stress and mortality? Does the spacing between trees need to increase? □Should stands be thinned at a more frequent interval to mitigate for increased forest stress and fire susceptibility? □Does the project area include anticipated future fire prone areas (i.e. higher elevation sites, or riparian areas)? □Will the season of harvesting need to change given the reduced snow pack and extreme flood events to mitigate for ground disturbance? □Is there a reliable water source for the thinning operations with anticipated drought conditions? □Will the proposed project help offset the projected impacts due to climate change?	- As a result of the thinning project, the stand will be better able to withstand future wildfire events. It influences the probabilities of surviving severe wildfire events. However, given current policy limitations, the stand will not be opened/thinned enough to the optimal level of prevention. -The stand should be thinned at a more frequent interval given unlimited funding resources. -The proposed project area does include some areas that might be prone to fires in the future, thus helping the forest withstand anticipated fire events in the future. -Harvesting schedules might be shifted forward or backward, depending on seasonal forecasts. Earlier snowmelt might move harvesting schedules forwards. -The purpose of the thinning project is to improve the health of the proposed project area, thus helping the stand to better adapt in the future to a changing climate.	□Yes □No □Yes, with modification: YES – Thinning helps reduce the likelihood of severe and catastrophic fire events, and promotes a healthier forest ecosystem.

Product 2: Evaluate Compatibility of Current Management Paradigms

- Existing management guidelines and frameworks usually developed for goals other than climate change
- Visit previous assumptions
- Do previous goals and targets conflict/complement different climate scenarios?

Current Management Paradigm: Sierra Nevada Forest Plan Amendment

- Sierra Nevada Forest Plan Amendment directs management of 11 National Forests in the Sierra Nevada Mountain Range.

- Initially driven by demand for spotted owl protection.

Product 2: Conclusions for Compatibility of Current Management with Climate Change

- Balancing refuge protection with mitigating for drought and fire risk
- Monitoring is suggested by the Framework, but difficult to implement given funding constraints
- There is a need for ongoing data collection, information exchange, and revision of management direction over time

Product 3: Addressing Uncertainty and Risk in Land Management Plans

- Forest Plans provide management guidance on a Forest for 15-20 years. Individual projects implement Forest Plan direction
- Climate change is addressed in a Comprehensive Evaluation Report (CER) conducted at the Regional level.

Product 3: Addressing Uncertainty and Risk Through Land Management Plans

- Types of Uncertainty: models, geographic and temporal scale, social and political
- Models and Forest Land Management Plans
- Applying landscape scale models to specific areas and watersheds. Forests are cautioned against using projections from models in planning, due to their broad scale.
- Monitoring and Adaptive Management continuously emphasized, but is it always feasible?

Barriers to Incorporating Climate Into Management

- Appeals and litigation
- Funding constraints limit project implementation
- Static management direction emphasizes maintaining or restoring conditions
- Constraints on staff time and capacity
- Small units limit management at the landscape scale

Lessons Learned

- Current adaptation strategy: manage for forest health to improve resiliency to change
- Need for dependable information and answers
- Managers need an expanded decision space, and ability to change course
- Litigation pressure is present
- Strengthen working relationships with partners and the public
- Importance of including climate change into Forest Plan Revision