

**TAHOE SCIENCE AND RESEARCH PROJECTS
ESTIMATED DIRECT COSTS & KEY MILESTONE DATES**

Project: Upland Fuels Reduction Monitoring Program	Sponsoring Agency: U.S. Forest Service, LTBMU	Date: March 10, 2004
Contact: Shane Romsos	Phone: 530-543-2600	EIP # 10123

Identify estimated costs of eligible reimbursement expenses:

1. Planning and Research Costs (Specialist surveys, reports, monitoring, data collection, analysis, etc.) USFS-LTBMU participation	\$ 50,000	13 %
2. Direct Project Labor (Payroll, fringe benefits)	\$ 0	0 %
3. Equipment (tools, software, specialized equipment, etc.)	\$ 0	0 %
4. Travel (Travel expenses associated with project)	\$ 0	0 %
5. Project Contracts, Grants and Agreements (Contracts, grants, agreements to be awarded) USFS-PSW agreement	\$ 330,000	85 %
6. Project Administration (contract admin services, procurement). USFS-LTBMU project administration	\$ 10,000	3 %
7. Other (Explain)	\$ 0	0 %
8. Contingency Reserve (Not to exceed 10%)	\$ 0	0 %
(3-YEAR PROJECT TOTAL: <input type="checkbox"/>	\$ 390,000	100 %)
CURRENT FUNDING REQUEST: <input type="checkbox"/>	\$ 100,000	100 %

Estimated Key Milestone Dates:

Milestones:	Date:	Estimated Costs
Project development	Mar 1, 2005	\$30,000
Field data collection summer 2004	Oct 1, 2005	\$60,000
Field data collection summer 2005	Oct 1, 2005	\$260,000
Data analysis and interim report for 2005	Mar 1, 2006	\$40,000

COMMENTS: This year's requested funding will cover project development (\$30K) and administration (\$10K) and will provide the first increment (\$60K) of funds needed for the field work. During summer '04, the field work will focus on fuels loading estimates and habitat typing. The remainder (\$290K) of the needed funding will be requested in the next SNPLMA round.

SNPLMA # _____ (To be assigned by Lake Tahoe SNPLMA Administration)

TAHOE PROJECT PROPOSAL

Project Name: Upland fuels reduction monitoring program **EIP #** 10123
Lead Agency: US Forest Service, LTBMU **Contact:** Shane Romsos
Threshold: Vegetation, Wildlife **Phone Number:** 530-543-2600
Threshold Standard: V-1, V-4, W-1, and W-2 **Email Address:** sromsos@fs.fed.us
Current Year Funding Request: \$100,000
(Total 3-Year Project Cost: \$390,000)

Research Collaborators:

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Erica Fleishman, Ph.D., Center for Conservation Biology, Stanford University, Palo Alto, CA

Shane Romsos, Wildlife Ecology Botany Group - LTBMU

Project Description:

A July 2002 review of the US Forest Service LTBMU Fuels and Vegetation Management Program stressed that a serious fuels problem exists in the Lake Tahoe Basin. The forests are even-aged, crowded, prone to infestations of damaging insects and pathogens, and pose a high threat of catastrophic wildfire. Increasingly, forest lands at the wildland-urban interface are being maintained as a defensible space for fire protection. Both forest structure and composition are manipulated through reduction of ground fuels and ladder fuels, thinning, and prescribed burning. The ecological impacts of these activities are unknown. In addition, these same questions exist in association with riparian areas, which are currently off-limits to treatments. According to the TRPA 2001 Threshold Evaluation, about 55 percent of the montane zone forest in the Basin is or will be manipulated in both structure and composition if a large defensible fuel profile zone (DFPZ) is maintained at the urban interface. It is imperative to understand the lasting ecological impacts of such changes.

A companion proposal has been submitted that proposes to investigate these same questions in riparian systems in the basin. Ideally, upland and riparian responses to fuel treatments would be funded so they can be investigated in a coordinated study design. The remainder of this proposal pertains only to the upland monitoring project.

The proposed project will concentrate on the effects on vegetation and wildlife of fuels reduction treatments in upland montane vegetation in the wildland-urban interface. Riparian zones will be considered in a linked proposal. At least three monitoring types will be selected for field sampling during the 2005 seasons (work likely will extend for several more years, but funding beyond 2005 is not sought in this proposal). Types will be differentiated on the basis of one or more of the following: vegetation composition, vegetation structure, sensitive plant and animal species, physiography, fuel characteristics, fuel reduction prescription, proximity to the urban zone, and treatment costs. Sampling of each monitoring type will utilize a paired plot design consisting of a

minimum of five replicate treated and control plots. Vegetation data collection in forest plots (20 x 50 m) (0.1 ha) will emphasize five variables: overstory trees, pole-size trees, tree seedlings, dead and downed fuels, shrub and herbaceous cover, and shrub density. Species richness, composition, and relative abundance of vertebrates and invertebrates will be monitored in larger areas centered on the vegetation plots. Sampling will be conducted before and after scheduled fuel reduction activities throughout the Lake Tahoe Basin and will focus on areas that have been ranked as highly susceptible to fire.

Describe the purpose and need for the project:

Fire protection is identified as a top priority in the Basin and multiple entities are actively engaged in fuels reduction programs. The fire-related resource management objectives and resulting fuel reduction prescriptions in these programs vary widely. Few objectives and standards for monitoring have been established and very little data exists on the direct effects of different treatments. Despite this dearth of scientific guidance, the pace of planned treatments is accelerating every year and the sensitive environment in the Basin has made fuels projects costly and complex compared to other geographic areas. The average cost of fuel hazard reduction in the LTMBU in the wildland-urban interface has been estimated at \$3,500/acre (including overhead, indirect costs, and contract administration). Although there is some interagency cooperation to conduct fuels and vegetation treatments, it is not comprehensive enough to ensure strategic and effective fuel treatments across jurisdictional boundaries or to maximize use of all available resources to complete the backlog of planned projects. Taken together, the large number of acres slated for treatment in the Basin, the high associated costs, and the unknown effects of these activities necessitate rapid development of a unified scientific monitoring program.

The objective of the proposed project is to develop a high quality monitoring program to evaluate the effects of different fuel reduction prescriptions in the urban interface on forest vegetation, wildlife habitat, and wildlife. In addition, it is necessary to determine whether these prescriptions are both biologically effective and cost effective for meeting resource objectives. Some activities may meet fuel reduction objectives, for example, but cause significant degradation of resources. Monitoring protocols for multiple management units that identify target/threshold conditions and detect the amount and direction of ecological change provide the scientific data required to inform sound management decisions. Establishing such links between outcomes and objectives is a key component of successful adaptive management.

The proposed project directly supports the vegetation threshold (V-1) to increase the structural diversity of forest communities and the recommendations made in the 2001 Vegetation Threshold Evaluation to develop monitoring protocols for wildland fire. It also supports the wildlife threshold (W-1) to provide disturbance zones for TRPA listed species. In addition to the value of understanding trends in manipulated forests as measured by diversity indices (e.g., species richness, relative abundance, and occurrence patterns), the monitoring protocols will indirectly benefit each of the TRPA thresholds because vegetation is a major factor in maintaining water and air quality, stabilizing soil,

providing resources for wildlife, filtering noise, and enhancing recreational and scenic resources.

Describe the goals and objective of the project (For Science & Research Projects describe Key Management Questions being addressed):

Goals and Objectives

The goal of the Upland Fuels Reduction Monitoring Program is to determine the ecological effects of fuels reduction prescriptions in the wildland-urban interface in the Lake Tahoe Basin and develop a monitoring program that can be used to evaluate the effectiveness of various prescriptions in meeting resource and fuels reduction objectives. A major objective is to compile information on the biological parameters, the spatial and temporal components, and the costs of various fuels reduction prescriptions in use in the Basin. At present, the project proposes to describe specific fuels reduction monitoring types and document any linkage between applied treatments and changes in resource condition.

Key Management Questions

This study as designed will address multiple key management questions that have been identified by resource and land management agencies in the basin. The study will generate new information on the effects of fuels treatments on vegetation and wildlife communities. Specifically, the study addresses one main biodiversity question along with three sub-questions and one adaptive management question:

- 2.1 How can we reduce the risk of wildfire to local communities in the Lake Tahoe basin while providing a healthy forest ecosystem?
 - 2.1.4 What ecosystem elements and management actions pose the greatest risk to old forest ecosystems and associated species, and what actions would be most effective and important in order to protect, conserve, and restore old forests?
 - 2.1.7 What are the effects of various fuel treatment methods (e.g., thinning, biomass removal, pile burning, area burning) on species and community characteristics, based on a combination of research, modeling, and monitoring?
 - 2.1.8 Detail a 10-year plan of mechanical thinning and prescribed fire that creates and maintains logical and functional DFPZs, and reintroduces fire to the ecosystem, consistent with vegetation and wildlife management objectives (defined in 2.1 above), and meets all applicable standards.
- 4.4.3 How is the ecosystem most likely to respond to EIP implementation and related environmental policy actions?

This study will inform the TRPA threshold update process by providing reliable, Basin-

specific information on appropriate and measurable monitoring protocols for vegetation and wildlife indicators.

Vegetation Protection Standards (V-1-4) – the proposed study will examine how fuels reduction activities promote changes in coverage (the threshold indicator) of common vegetation. While many of the Rare Plants (V-3) occur in remote and normally inaccessible areas, several of the Uncommon Plant Communities (V-2) occur in the montane zone in the wildlife-urban interface, and any increase in resource management activities may potentially affect these thresholds. This study will provide information on potential standards and indicators for patch-scale vegetation structure and composition that are associated with different fuel treatments

Special Interest Wildlife Species (W-1) threshold standard -- it is proposed that this threshold be updated to focus on species at population and community levels, including “Focal Species” (W-1), consisting of species at risk and of special interest, and “Species Diversity” (W-3), consisting of measures of biological diversity and integrity, including native and exotic species by ecosystem type. The study will inform these threshold standards and indicators by providing information on patterns of plant and animal species presence and composition that are associated with undisturbed patches and compare these to patches subject to fuels reduction activities. The information will provide data on the sensitivities of some forest-associated focal species to disturbance and fragmentation, and inform species-specific standards and indicators.

“Habitat of Special Significance” (W-2) threshold standard - this threshold overlaps to some degree with the vegetation protection standards and affords an opportunity to document the changes in wildlife habitat quality that are associated with fuel reduction-related changes in vegetation structure and composition.

Describe the anticipated project accomplishments:

The activities funded by this proposals are partitioned into the following accomplishments:

1. Compile information on fuels reduction prescriptions in use in the Basin in 2004.
2. Define ecotypes to be studied and establish sampling design and field protocols for vegetation, vertebrates, and invertebrates early in 2005.
3. Conduct data collection in 2005.
4. Conduct data analysis and provide interim reports on monitoring activities and results at of the end of the 2005.

Describe the “readiness” of this project to move forward (Environmental documentation, etc.)

The proposed project was initially submitted for funding to the Science Advisory Group for TRPA in November of 2003. The principal investigators and research institutions are positioned to design the project in 2004 and implement in 2005. Requested funding would fully fund project design and the first year of implementation and reporting. The study will require a minimum of 3 years of data collection, thus 2006 and 2007 would

require approximately \$350,000 in funding, with the final year requiring approximately \$250,000 for final analysis and writing.

Describe partnerships for this project. (Include documentation)

This proposal is a collaborative effort between Mills College, USFS PSW Sierra Nevada Research Center, University of Nevada, Reno, and Stanford University, in collaboration with the USFS Lake Tahoe Basin Management Unit. Scientists from the four research institutions listed above are part of the science team designing and implementing the project.

For Science & Research Projects describe how this project will guide future management activities:

This study will inform management in numerous ways described above, and summarized here:

- It will provide a tool for evaluating the ecological consequences of fuel reduction scenarios on vegetation structure and composition and species richness, relative abundance, and occurrence patterns of vertebrates and invertebrates.
- It will provide information on the effects of fuel reduction on potential standards and indicators for patch-scale habitat quality for vulnerable vertebrate and invertebrate species in the Basin.
- It will inform the adaptive management process by providing information on the development of fire-related resource management objectives and the efficacy of associated fuels reduction prescriptions.
- It will streamline methodologies for assessing the environmental impacts of fuels treatments and determine differences in cost efficiency in meeting objectives.

Include an 8 ½ X 11 map depicting the project, or research/study area.

Figure 1. Location of potential treatment study sites throughout the Lake Tahoe basin. The exact project locations will be determined by scheduled fuels reductions treatments throughout the Basin. These will be prioritized by fire susceptibility so we have attached the map depicting the mean fire susceptibility index by watersheds, developed for the Lake Tahoe Watershed Assessment.

