

SNPLMA Project #: \_\_\_\_\_

(To be assigned by SNPLMA Administration)

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

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

**Identify estimated costs of eligible reimbursement expenses:**

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

**Estimated Key Milestone Dates:**

<b>Milestones:</b>	<b>Date:</b>	<b>Estimated Costs</b>
Project development	Mar 1, 2005	\$30,000
Field data collection summer 2005	Oct 1, 2005	\$320,000
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. 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**

<b>Project Name:</b> Riparian Fuels Reduction Monitoring		<b>EIP #</b> 10123
<b>Lead Agency:</b> US Forest Service, LTBMU	<b>Contact:</b> Shane Romsos	
	<b>Phone Number:</b> 530-543-2600	
<b>Threshold:</b> Vegetation, Wildlife	<b>Email Address:</b> sromsos@fs.fed.us	
<b>Threshold Standard:</b> V-1, V-4, W-1, and W-2	<b>Current Year Funding Request:</b> \$100,000 (Total 3-Year Project Cost: \$390,000)	

**Research Collaborators:**

Bruce Pavlik, Ph.D., Principal Investigator, Mills College, Oakland CA 94613 [bruce@mills.edu](mailto:bruce@mills.edu) 510-430-2158

Patricia Manley, Ph.D., co-PI, Sierra Nevada Research Center, USFS Pacific Southwest Research Station, Davis, CA [pmanley@fs.fed.us](mailto:pmanley@fs.fed.us) 530-902-3431

Dennis Murphy, Ph.D., Department of Biology, University of Nevada, Reno, NV

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. 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. However, stream environment zones (SEZ) are excluded from consideration in most fuels treatment programs due to concerns over potential sediment and nutrient loading. Riparian zones, including meadows and marshes, may in fact support dense stands of encroaching pines that pose a severe wildfire risk. The ecological impacts and benefits of fuels reduction activities on function and stability of riparian systems and their constituent plant and animal species are virtually unknown.

This proposal is linked to an upland monitoring proposal to answer similar questions. Ideally, both proposals would be funded so that upland and riparian responses to fuels treatments could be investigated through a single coordinated study design. The remainder of this proposal pertains only to the riparian monitoring project.

The proposed project will concentrate on the effects of fuels reduction treatments on vegetation and wildlife in montane riparian zones severe wildfire risk areas. The need for information on disturbance processes and patterns of land cover and species occurrence in riparian systems extends throughout the Sierra Nevada; data ultimately should be gathered for a range of stream types and geophysical settings. To date, riparian areas have been off-limits to fuel treatments based on the assumption that they will do more harm than good. However, the effects of overstocking and lack of fire, combined with

the risk of severe wildfire, create the need to test and better understand how to effectively manage riparian forests. Thus, an adaptive management approach to fire and fuels management in riparian ecosystems in the basin is much needed. A linked proposal has been submitted by these same investigators to address the effects of fire and fuel treatments in upland forests. Ideally, both proposals would be funded simultaneously so the study can be designed to understand how management effects differ between the two ecosystems.

We will select several ecotypes for field sampling during the 2005 and 2006 seasons (work likely will extend for several more years, but funding beyond 2006 is not sought in this proposal). Types will be differentiated on the basis of one or more of the following: lotic environment, vegetation composition, vegetation structure, sensitive plant and animal species, fuel characteristics, proximity to the urban zone, and treatment costs. Since very few (or no) fuel reduction prescriptions that are tailored to SEZs currently exist, we propose to design fuel reduction prescriptions in collaboration with the Lake Tahoe Basin Management Unit that minimize the amount of treated area and emphasize cost-benefit considerations. Sampling of each ecotype will utilize a paired plot design consisting of replicated treated and control plots. The size of the permitted research areas may restrict the scope of the experimental design, leading us to evaluate a relatively small number of treatment types using replicates sufficiently large in number to support robust statistical analysis and ecological inferences.

Vegetation data collection in riparian plots 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 riparian-associated vertebrate and invertebrate species 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:**

There is wide acknowledgement that fire poses a significant risk in the basin and substantial support among land management agencies, regulatory agencies, and the general public to implement effective measures to reduce that threat. A companion proposal to this proposed project focuses on determining the effects of several of the most widely accepted fuel reduction treatments that are already taking place in upland montane forests. However, fuel reduction treatments in riparian zones require special consideration. Current regulatory guidelines greatly restrict many activities in the SEZ that potentially could lead to a reduction in the clarity of Lake Tahoe. Although some of the factors that cause soil erosion, sedimentation, and nutrient loading in streams are well documented, the effects of a carefully designed fuel reduction prescription on vegetation and wildlife in the SEZ have not been studied, and uncertainty about the effects of treatment is a barrier to effective management. Fire specialists, vegetation managers, and aquatic resource specialists agree that excluding SEZs from fire protection measures actually may increase the risk of degradation of these sensitive systems.

The objective of the proposed project is to develop a set of fuel reduction treatment recommendations for montane riparian zones and an associated monitoring program to evaluate the effects of the resulting prescriptions on riparian forest vegetation, wildlife habitat, and wildlife. A cost-benefit approach will determine whether these prescriptions are both biologically effective and cost effective for meeting resource objectives. Monitoring objectives will explicitly identify target/threshold conditions and the amount and direction of ecological change from the starting condition. The proposed project has been identified as high priority in the adaptive management framework and it will generate the necessary quantitative, scientific data on fire effects in riparian zones to inform sound decision making.

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 and relative abundance) and occurrence patterns, 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. Riparian-specific fuels reduction prescriptions may lead to improved fire protection.

**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 riparian Fuels Reduction Monitoring Program is to investigate the ecological effects of fuels reduction prescriptions in the riparian wildland-urban interface and document any linkage between applied treatments and changes in resource condition. A secondary objective is to address regulatory limitations on implementing fuels reduction projects in SEZs in the Lake Tahoe Basin. The proposed project will develop a specific set of prescriptions for riparian fuels management and a monitoring program that can be used to evaluate the effectiveness of the prescriptions in meeting resource and fuels reduction objectives. Many of the monitoring protocols will be similar to those in upland systems but will include additional components to determine whether regulatory relief from strict SEZ guidelines is feasible within a fuels management program. In addition, a cost benefit model will be applied to biological and economic criteria in determining the feasibility of future projects.

**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

assemblages in riparian zones. This proposed study addresses the same main biodiversity question, two sub-questions, and one adaptive management question as the companion upland proposal. This proposal also specifically addresses those features in stream environments that need to be preserved in restoration efforts.

- 2.1 How can we reduce the risk of wildfire to local communities in the Lake Tahoe basin while providing a healthy forest ecosystem?
  - 2.1.7 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?
- 4.4.4 What are the features of wetlands, riparian habitat and other stream environment zones that maximize pollutant removal? How can we replicate these features in restoration projects?

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 and the companion upland forest 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 new tool for evaluating the ecological consequences of fuel reduction scenarios in riparian environments, and provide a basis for developing standards and guidelines for treating fuels in riparian zones in the Lake Tahoe basin.
- 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.
- This projects specifically addresses regulatory limitations on implementing fuels reduction projects in SEZs in the Lake Tahoe Basin.

**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.

