Appendix B-8

LAKE TAHOE RESTORATION PROJECTS
ESTIMATED DIRECT COSTS & KEY MILESTONE DATES

Project Name: Cookhouse Meadow Wildlife Monitoring and Adaptive Management Plan Implementation (Post-Construction) **Agency:** LTBMU – Forest Service
Prepared by: Craig Oehrli **Phone:** 530-542-2136 **EIP #:** 10133.1

Identify estimated costs of eligible reimbursement expenses:

1. Planning, Environmental Assessment and Research Costs (specialist surveys, reports, monitoring, data collection, analysis, NEPA, etc.)	$	64,000	%
2. Direct Labor (Payroll) to Perform the Project	$	500	%
3. Project Equipment (tools, software, specialized equipment, etc.)	$		%
4. Travel (including per diem where official travel status required to carry out project, such as serve as COR, experts to review reports, etc.)	$		%
5. Official Vehicle Use (pro rata cost for use of Official Vehicles when required to carry out project)	$	500	%
6. Cost of Contracts, Grants and/or Agreements to Perform the Project	$		%
7. Other Direct Costs (direct labor for agency personnel to do project procurements; COR; PI; personnel assigned as NEPA lead; personnel assigned to review contracted surveys, designs/drawings, reports, etc.; project manager and/or project supervisor; and contracted costs for project manager and/or project supervisor if contracted separately	$	10,000	%
TOTAL*:	$	75,000	100 %

Estimated Key Milestone Dates:

Milestones/Deliverables:	Date:
Spring monitoring report (preliminary)	6-06
Fall monitoring report (preliminary)	10-06
Year-end report to the Forest Supervisor (final)	12-06
Final Completion Date: October 2015	

COMMENTS: This is multi-year monitoring and Adaptive Management Plan.

Appendix I-2
GENERAL TAHOE PROJECT PROPOSAL

Project Name: Cookhouse Meadow Wildlife Monitoring and Adaptive Management Plan Implementation (Post-Construction) **EIP #** 10133.1

Lead Agency: U.S. Forest Service, LTBMU

Contact: Craig Oehrli
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Threshold: W, SC, WQ, F, V
Threshold Standard: W-1, W-2, SC-2, WQ-1, WQ –4, WQ-5, WQ-6, F-2, V-1

Total Project Cost: $ 1,200,000
Round 6 Funding requested: $75,000
Is this a multi-year project? Yes

Project Description:

The LTBMU, Ecosystem Restoration Group is requesting funding from the Southern Nevada "P" Land Management Act (SNPLMA) to continue with Wildlife Monitoring Plan and initiate the Adaptive Management Plan. The LTBMU has already secured $ 902,100 in Round 5, for the construction of 2200 feet of stream channel needed to replace a deeply incised, non-functioning stream that impairs ecosystem function. Implementation of this plan is needed to monitor post-construction trends in both biological and physical processes in Cookhouse Meadow; these trends are critical for interpreting the effects of stream and meadow surface restoration. The activities for which the LTBMU is requesting funds for SNPLMA-Round 6 are:

1. Post construction wildlife population trend monitoring.
2. Post construction ground water well monitoring
3. Documenting spatial trends in vegetative recovery using photo points
4. Meadow vegetation trend monitoring
5. Measurements of post-construction stream and meadow cross sections (3)
6. Monitoring for recovery of surface flooding frequency
7. Monitoring trends in post construction macro-invertebrate populations
8. Aerial photographic documentation (flights made at regular intervals and after unusually large flood events)

Many of these tasks, are a continuation of the pre-construction monitoring activities. Several facets of this plan currently have one or more years of pre-construction data and when combined with post –construction monitoring, will give the LTBMU the data so that it can verify that it is meeting its management goals and objectives to restore the Cookhouse Meadow riparian ecosystems; or manage it adaptively if trends show that management actions were not effective in restoring ecosystem processes and function.

The LTBMU Ecosystem Restoration Group believes that monitoring of this site will require additional funding in future years in order to complete the monitoring requirements needed to verify whether or not stream and meadow restoration at this site can be considered successful.

Describe the purpose and need for the project:

The primary purpose of this plan is to provide the data to LTBMU as part of the requirement to manage ecosystems adaptively; particularly its meadow ecosystems, which function as sediment and nutrient filters and are an important factor in maintaining and restoring Lake Tahoe's unusually high clarity. The need for this suite of measurements is based on the assumption that the interactions

between biological and physical process are complex; several different types of measurements may be needed initially to serve as cross-checks upon each other, so that the LTBMU can manage adaptively based on the best scientific information possible.

Describe the goals and objective of the project:

The goals and objectives of these monitoring plan is as follows

Post construction wildlife trend monitoring

The goal of this facet is to show how trends in wildlife populations are affected by stream and meadow surface restoration. The objective is continue carrying out previously established monitoring plans for this site; by 2006 the LTBMU will have already collected data over two seasons so that trends in wildlife recovery can be tracked.

Post construction ground water well monitoring

The goal of this facet is to show how seasonal ground water levels are affected by stream and meadow surface restoration. The objective is to continue monitoring ground water levels on 14 ground water wells in placed in Cookhouse Meadow in late 2002; by 2006 the LTBMU will have three years of pre-construction and one year of post construction data to track variations in ground water levels along with the anticipated recovery of seasonal ground water elevations, which are critical for reestablishing desirable riparian plant species.

Meadow vegetation trend monitoring

The goal of this facet is to quantify the recovery of meadow surface vegetation affected by stream and meadow surface restoration. The objective is continue monitoring vegetation transects established in 1999; by 2006 the LTBMU will have two years of trend data from which to quantify anticipated positive trends in vegetative recovery in the meadow.

Documenting spatial trends in vegetative recovery using photo points

The goal of this facet is to track the recovery of meadow vegetation spatially. The objective is continue with photo documentation from photo points established in 2004; by this time the LTBMU will have two years of pre-construction and one year of post construction data to track vegetative recovery; these measurements will also provide an important check on the reliability of both vegetation trend plots and seasonal water table elevations as indicators of recovery following stream and meadow restoration.

Measurements of post-construction stream and meadow cross sections

The goal of this facet is to quantify changes, both beneficial and adverse, in the newly constructed stream channel. The objective is continue measuring these three cross sections that were established in 2004; by 2006 the LTBMU will have one year of pre-construction and one year of post-construction data to changes in physical channel cross sectional structure. These measurements will provide an important check on the assumptions made in designing the newly constructed channel and may be important indicators in the adaptive management process, particularly if the other ecosystem components are responding negatively to stream reconstruction.

Monitoring for recovery of surface flooding frequency

The goal of this facet is quantify the recovery of surface flooding frequency in Cookhouse. The initial assumption is that every 1.5 years the surface of this meadow will be inundated with water. The objective is to quantify the timing and duration of meadow surface inundation using automated water level recorders. The LTBMU will with begin measuring for surface flooding frequency on the existing channel in 2005 and 2006, followed by surface flooding frequency measurements on the constructed channel in 2007. These measurements will provide and important check on channel design assumptions and will also provide data on flooding frequency of high elevation meadow ecosystems.

Monitoring trends in post construction macro-invertebrate populations

The goal of this facet is quantify the changes in macro invertebrate populations. The

objective is to continue aquatic invertebrate monitoring using standard measurement protocols; by this time the LTBMU will have three years of pre-construction data from which to establish trends related to stream and meadow surface restoration.

Aerial photographic documentation

The goal of this facet is to track spatial changes in channel form and vegetative recovery. The LTBMU currently has a set of sequential aerial photos of this site dating back to 1939.The objective is to continue aerial photographic documentation at regular intervals and to request aerial photo generation in the event the site experiences an unusually large flood event e.g. rain on snow or summer thunderstorm flood. These measurement will provide yet another check on meadow ecosystem recovery; they may also help reveal trends not seen in other measurements such as what is seen at established cross sections.

Describe the anticipated project accomplishments:

The measures, as described above, will both quantitatively and qualitatively asses whether or not the restoration actions are restoring natural ecological processes and function in 25 acres of this stream / meadow ecosystem. The measures will also track the restoration of fluvial geomorphic processes in 2200 feet of meadow stream.

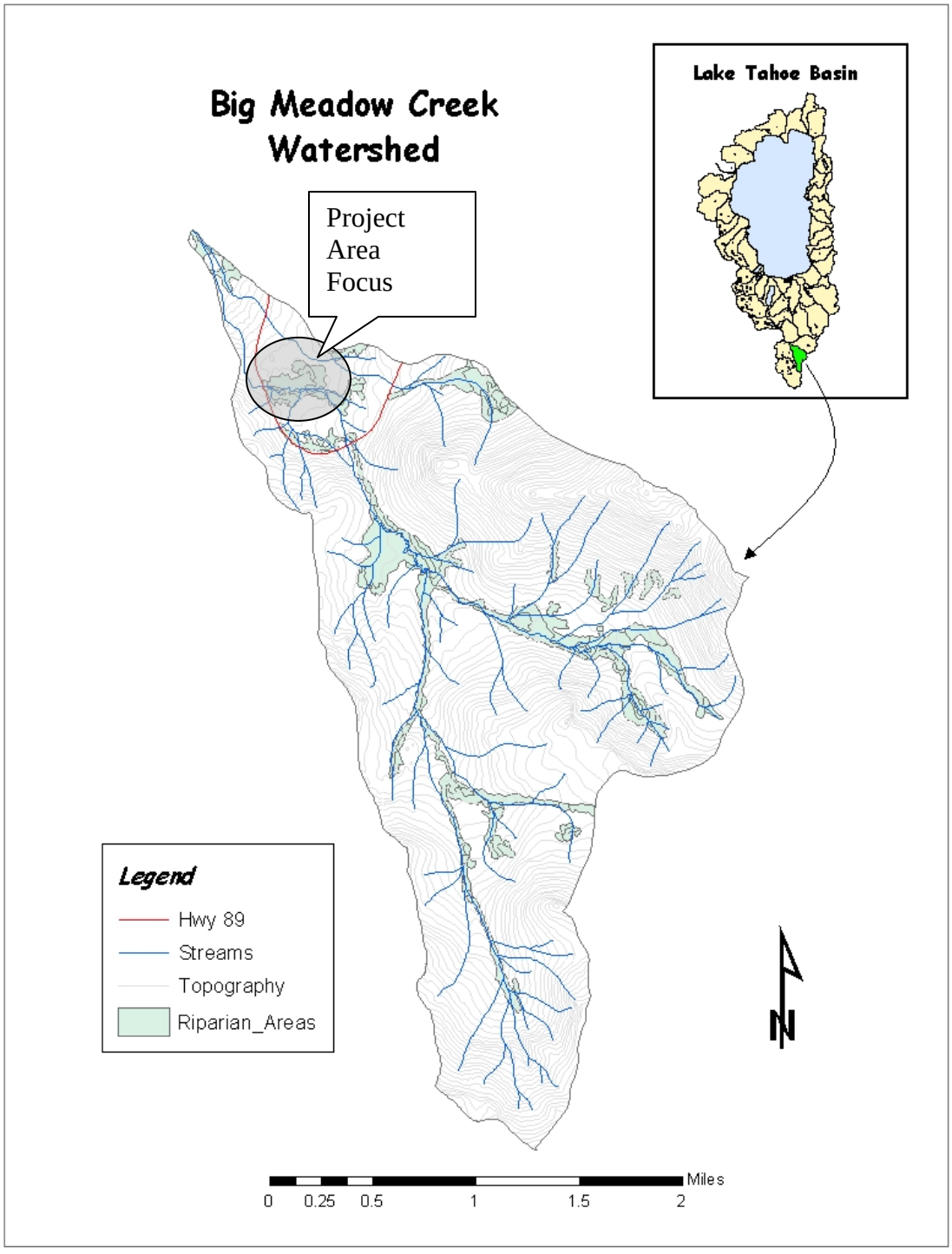
Describe the "readiness" of this project to move forward (environmental documentation, etc.):

In March 2004, the LTBMU completed the NEPA process when a decision notice to proceed with this project was signed by the Maribeth Gustafson, Forest Supervisor. Swanson Hydrology and Geomorphology (SH&G) completed a set of engineering plans and specifications for construction of new stream channel in June 2004. Environmental permits from the Army of Engineers, the Tahoe Regional Planning Agency, and the California State Water Resources Board will be have been completed by November 2004. The SNPLMA administration has already approved funds for stream channel construction for FY 2005.

As described in the under "Project Goals and Objectives", data collection to track project effectiveness has already begun with the collection of pre-construction data on key meadow ecosystem indicators such wildlife populations, ground water levels, and vegetation.

Describe partnerships for this project (include documentation):
The Tahoe Regional Planning Agency and the California State Water Resources Control Board are members of the technical advisory committee. In addition to partnerships with local regulatory agencies, the LTBMU is a key member of the local chapter of the Environmental Education Service Learning Program. This program gives both elementary and middle school aged students an opportunity to experience on-the-ground experience in watershed management. The LTBMU currently is working with teachers from the local school district to involve students in this monitoring and adaptive management program. The students will assist LTBMU Ecosystem Restoration specialists in activities such as photo point documentation and measurements of ground water levels.

Describe the anticipated project effectiveness monitoring program for use with adaptive management framework:
The LTBMU Ecosystem Restoration Group believes that this suite of eight measurements will ensure that the LTBMU is able to evaluate the stream and meadow restoration efforts in Cookhouse Meadow from an ecosystem process prospective. This monitoring plan will provide management with indicators that when evaluated cumulatively, are a measure of meadow ecosystem health.



Cookhouse Meadow Project Vicinity Map