

**WADDLE RANCH/NORTHSTAR WATERSHED
IMPROVEMENT PROGRAM**

**Proposed Supplemental Environmental Project
for the
Lahontan Regional Water Quality Control Board**

Prepared by Michael Hogan, IERS, Inc. on behalf of
Northstar Mountain Properties, LLC
February 26, 2009

Waddle Ranch/Northstar Watershed Improvement Program
Proposed Supplemental Environmental Project
for the Lahontan Regional Water Quality Control Board

February 26, 2009

Executive Summary	1
Part 1: Introduction and Location Maps	2
Part 2: General Project Description	4
SEP Project Elements	4
Waddle Ranch Watershed and Restoration Improvements.....	4
Watershed Evaluation, Treatment and Monitoring Handbook.....	5
Forest Vegetation Treatment/Water Quality Protection Handbook.....	5
Northstar Riparian and Forest Enhancement Project.....	6
Nexus Discussion.....	6
Nexus to Violations.....	6
Nexus to Other Regional Projects.....	7
Partners and Advisory Groups	7
SEP Advisory Group Process.....	8
Technical Advisory Group Process.....	9
Part 3: Work Plan	9
Description of Key Tasks and Work Items	9
Work Item 1: Project Initiation	9
Work Item 2: Project Administration.....	10
Work Item 3: Project Assessment and Evaluation Plan (PAEP) and Quality Assurance and Quality Control (QA/QC) Document.....	12
Work Item 4: Waddle Ranch Restoration.....	14
Work Item 5: Watershed Evaluation, Treatment and Monitoring Handbook	18
Work Item 6: Forest Vegetation Treatment/Water Quality Protection Handbook	22
Work Item 7: Northstar Riparian and Forest Enhancement Project.....	25
Work Item 8: Project Implementation and Monitoring Contingency	30
General	30
Transfer of funds between and among work items.....	30
Finalization of task and work items	31

Part 4: Project Team and Administration..... 31

Third Party Oversight..... 32

Part 5: Deliverables Table 32

Cost-estimate and Budget 34

Attachment 1: Gantt Chart

Attachment 2: SEP Project Budget

Attachment 3: Waddle Ranch Water Quality Monitoring Costs

Attachment 4: SEP Advisory Group Costs

Attachment 5: Watershed Technical Group Costs

Attachment 6: Forestry Technical Group Costs

Waddle Ranch/Northstar Watershed Improvement Program

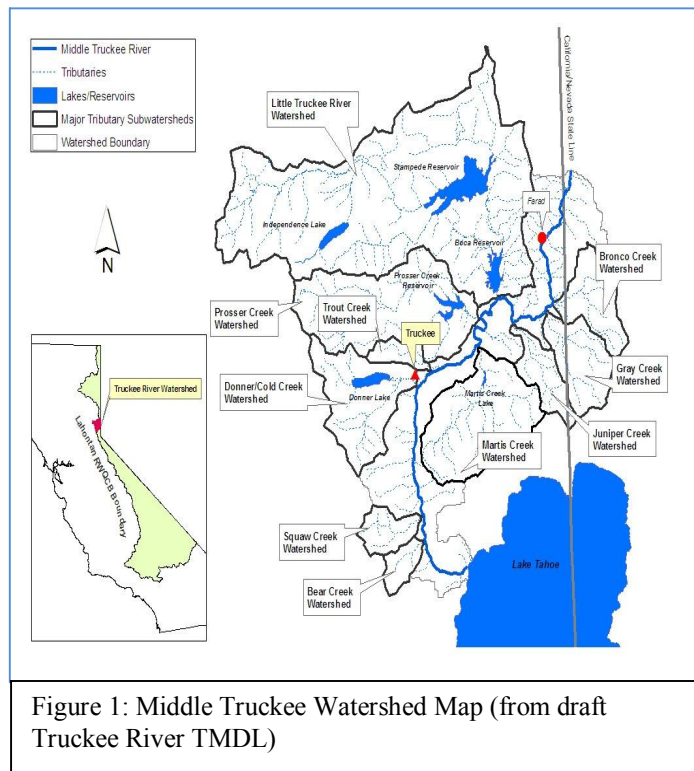
Proposed Supplemental Environmental Project for the Lahontan Regional Water Quality Control Board

Prepared by Michael Hogan, IERS, Inc. on behalf of Northstar Mountain Properties, LLC
February 26, 2009

Executive Summary

As part of a proposed settlement for water quality violations, Northstar Mountain Properties, LLC is submitting this Supplemental Environmental Project to improve water quality and biological resources in the Martis Valley region. The improvements will be phased over five years and will include work within the Waddle Ranch property and within the general Northstar area (hereinafter referred to as Northstar, and the project area is identified in Figure 8). These two project areas are in the same overall watershed where the violations occurred (Martis Creek Watershed; see Figure 1). The exact improvements and specific locations will be defined collaboratively by SEP Advisory group that will include representatives from the Truckee River Watershed Council (TRWC), Truckee Donner Land Trust (TDLT), Northstar Mountain Properties, LLC (NMP), Northstar Fire Department (NFD), Integrated Environmental Restoration Services (IERS), and the Lahontan Regional Water Quality Control Board (LRWQCB). The improvements will include projects within the following three categories: road and upland restoration, stream restoration and forest fuels removal.

Targeted, real-time monitoring will be conducted at each project before and after treatments. In-stream water quality monitoring will also be conducted to measure reductions in sediment loading for the entire property. Monitoring results will help fill critical gaps in understanding the impacts of various treatments and management activities on erosion and water quality and validate a set of treatment tools. Technology transfer is also a key component of the project. Two handbooks will be produced to assist land managers and landowners within the Sierra Nevada in planning, implementing and monitoring watershed improvement and forest vegetation reduction projects.



Part 1: Introduction and Location Maps

The Waddle Ranch/Northstar Watershed Improvement Program Supplemental Environmental Project (hereinafter referred to as the SEP project) is designed to enhance and improve watershed conditions within the Waddle Ranch property and to improve forest conditions in the Middle Fork Martis Creek area, located in and near the Martis Valley, eastern Placer County, California. Further, this project is intended to serve as a model for other watershed activities in the region. This project has been conceived as part of the settlement associated with the water quality violations incurred by contractors working for NMP at Northstar during the 2006 construction season. This SEP project will be funded by NMP as a result of those violations and is being implemented in an attempt to offset environmental impacts related to some of those violations. The SEP project is designed and managed such that overall water and environmental quality will be improved in the same watershed as Northstar, which is the Martis Creek Watershed. The locations of these improvements are the Waddle Ranch, which is owned by the Truckee Tahoe Airport District (TTAD), and on Northstar property in the Middle Fork Martis Creek Drainage (see Figure 2). The planned improvements will be demonstrated through qualitative and quantitative measurement in three key areas: 1) road and upland restoration, 2) stream restoration, and 3) forest fuels removal.

Beyond the obvious water quality and biological benefits produced by this SEP project, the project is designed to fill two significant knowledge gaps in watershed restoration and management. In an effort to close these gaps, the two following work products will be produced: 1) Watershed Evaluation, Treatment and Monitoring Handbook (Work Item #6) and 2) Forest Vegetation Treatment/Water Quality Protection Handbook (Work Item #7). The first handbook will provide land managers, land trust staff, watershed councils, agency staff and others with a direct, accessible and cost effective method of evaluating, repairing and monitoring watersheds and sub-watersheds for water quality related improvements. The second handbook will consist of a set of science-based guiding principles for different forest vegetation treatments that incorporate water quality protection and an adaptive management process for ensuring water quality is integrated with fuels treatment program development. This product will be based on the Sediment Source Control Handbook (SSCH) process (http://www.swrcb.ca.gov/lahontan/water_issues/available_documents/carec.shtml). The guiding principles and toolkit contained in the SSCH are designed to anchor a larger,

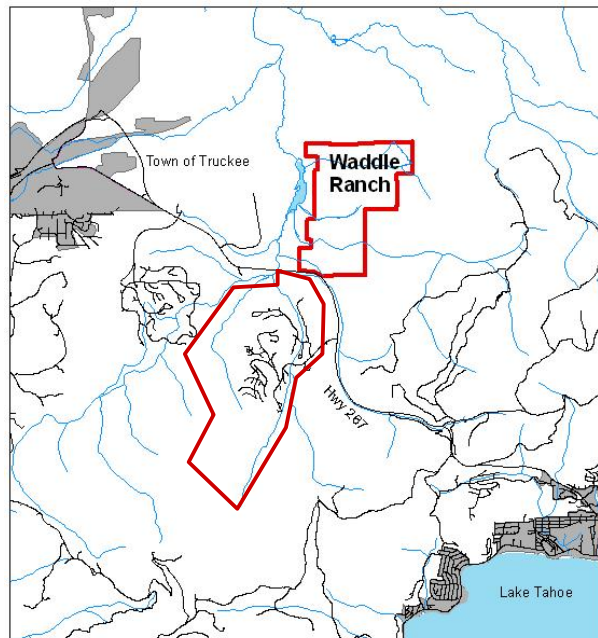
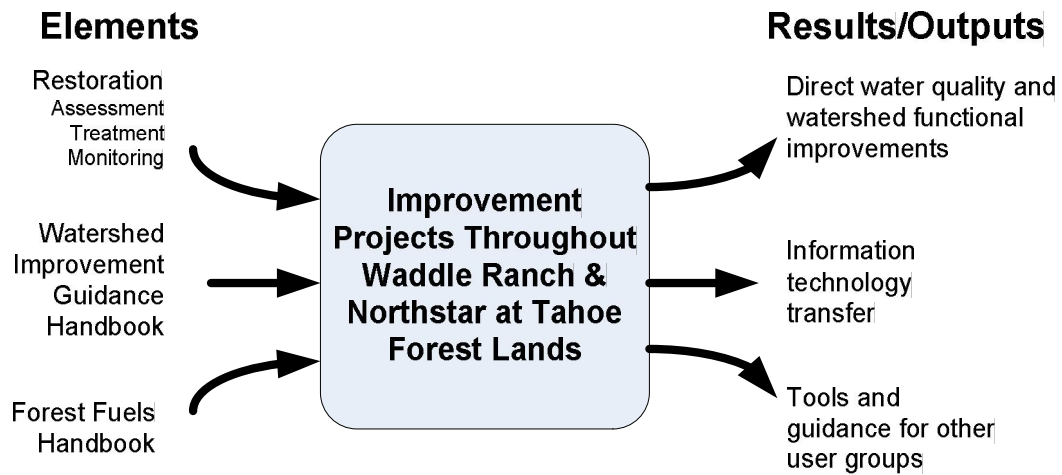


Figure 2. Locations of Waddle Ranch and Northstar

regional cooperative effort aimed at creating a balanced approach to fuels reduction work that considers erosion impacts and mitigation of those impacts. This larger effort is supported by the LRWQCB staff and a broad range of stakeholders including NFD, TRWC, the Lake Tahoe Regional Fire Chiefs Association, Tahoe Regional Planning Agency (TRPA) staff, and others.

Both of the handbooks produced by the SEP project will build on work done by IERS over the last decade. This work has incorporated true adaptive management into field projects and provides a process for quantitative assessment and continual improvement for erosion and water quality issues throughout the Sierra Nevada. IERS, the author of this document and the contractor to NMP for SEP project implementation, has created and continues to evolve collaborative, science-based products that fill critical knowledge and/or process gaps, as exhibited in the SSCH (see link, above). The SSCH has been a collaborative effort between the Lahontan LRWQCB, six California Ski Resorts, the US Forest Service, and other stakeholders.

The SEP project allocates the majority of funding to on-the-ground, direct water quality improvements (almost 80% of the budget is dedicated to this work). Without the funding provided by the SEP project, the work needed to provide these direct water quality improvements in the Martis Creek watershed would take a decade or more to complete. The SEP project funding will result in immediate improvements to the water quality and biological resources in the Martis Valley. SEP-funded improvements will take place over five years and are designed to provide the foundation for continued watershed management efforts at Waddle Ranch and Northstar.



Part 2: General Project Description

The Waddle Ranch/Northstar Watershed Improvement Program is structured as a Supplemental Environmental Project. This SEP project is designed to be implemented as a truly adaptive management project¹ in that it will integrate goal setting, engagement of appropriate partners and stakeholders, planning, implementation, monitoring, management response where necessary, and targeted information sharing. It is designed to apply a broad range of techniques, processes, and practices for road and upland restoration, stream restoration, and forest vegetation management while at the same time filling information gaps within those practices.

The task of effective watershed assessment, treatment and monitoring is often overwhelming for many land managers. This project is intended to serve as a functional, understandable, and working model for the many Land Trusts, Watershed Councils, and landowners across the Sierra Nevada.

SEP Project Elements

Waddle Ranch Watershed and Restoration Improvements

The primary focus of the proposed SEP project is restoration of impacted areas of Waddle Ranch in the Martis Valley. Waddle Ranch has been selected due to its location in the same watershed as Northstar, the similarity of types of improvements needed, and the overall value of restoration on this site to the region. Work on the Waddle Ranch is supported by significant public interest. Waddle Ranch was recently purchased by the TDLT and subsequently conveyed to TTAD with an in perpetuity conservation easement on the land. This effectively has created a great deal of permanent open space and public access land in the Martis Valley. The projects at Waddle Ranch are expected to improve water quality in the East Fork of Martis Creek, which enters Martis Reservoir just below the project area. Projects under the proposed SEP project will complement other projects such as the Martis Creek Restoration Project. The SEP project will use an adaptively managed process to set goals, plan, implement, and monitor watershed improvements and will disseminate the information gained through site tours and two distinct handbooks (described below).

The watershed improvement process will focus on water quality related to erosion and forest management. Specifically, watershed improvement will entail the Erosion-focused Rapid Assessment (EfRA) process, field verification of problem (sediment producing) areas, treatment/restoration of problem areas identified in the EfRA (such as removing or modifying eroding roads and rerouting or restoring channelized drainages), and post treatment monitoring of those areas for quantification of improvement. Monitoring will be based on strategies developed elsewhere and will include: 1) real-time and indicator measurement of several functional parameters in the treatment area, including infiltration, runoff, sediment production, and a range of soil and vegetation parameters, and 2) water quality monitoring above and below

¹ This process is described in detail in the Sediment Source Control Handbook: http://www.swrcb.ca.gov/lahontan/water_issues/available_documents/carec.shtml

project areas. The functional monitoring processes are similar to and based on those used to develop portions of the Lake Tahoe Total Maximum Daily Load (TMDL) implementation strategies. These techniques will be described in detail in the Project Assessment and Evaluation Plan (PAEP) and Monitoring Section of the SEP project. Background monitoring began in the spring of 2008 and will be continued upon approval of the SEP project.

Watershed Evaluation, Treatment, and Monitoring Handbook

This element of the SEP project involves the development and application of a systematic, cost-effective, and transferable approach to watershed evaluation, treatment, and monitoring. This document will fill a void that currently exists and will provide land managers and agencies with a user-friendly process to: 1) focus watershed assessment on erosion problem areas, 2) provide an adaptive management-based planning and implementation guidance process, and 3) provide clear direction on how and what to monitor in order to quantitatively assess impacts of watershed improvement efforts. This handbook and process is directly applicable to TMDL implementation² within and beyond the Martis Valley and Middle Truckee River.

Forest Vegetation Treatment/Water Quality Protection Handbook

This portion of the project will define an adaptive management approach to fuels treatment and forest management with special emphasis on water quality protection and prevention of erosion. This handbook will be based on the Sediment Source Control Handbook and will use a similar adaptive, collaborative process to define and achieve goals. Deliverables will be a set of guiding principles for forestry practices with a foundation in adaptive environmental management, a 'toolkit' for fuels reduction and forest management that quantifies the impacts and potential impacts on water quality, and a set of related mitigation procedures where applicable. This portion of the project is designed to serve as a foundation for a more robust understanding of the impacts of forest vegetation treatments currently underway or planned for the Truckee-Tahoe region. If used appropriately, this handbook will help maintain or improve water quality while allowing land managers to implement cost-effective fuels reduction treatments.

This handbook may provide a starting point for a more robust, regional Forest Vegetation and Erosion Management Handbook that can be used throughout the region. Potential funding for this larger effort has already been identified from a number of other sources and interest groups including the Nevada Fire Safe Council (John Pickett), the Truckee-Tahoe Fire Chiefs Association (Mark Shadowens, Chief, Northstar FPD, John Pang, President, Meeks Bay FPD) and other private landholders and entities. Funding has also been requested from the Sierra Nevada Conservancy to enhance this handbook (final response pending).

² Essentially, TMDL is the estimated amount of pollutant that can enter a water body without causing long term impairment. This regulatory tool is being used to attempt to help a number of water bodies to recover. The Middle Truckee River, into which Martis Creek flows, is now under the requirements of a TMDL.

Northstar Riparian and Forest Enhancement Project

This portion of the project will address overstocked and decadent riparian corridors and adjacent forest areas in an effort to reduce fire danger and enhance riparian habitat values in the Northstar area. This work will help reduce the potential for catastrophic wildfire and associated erosion associated with major loss of vegetation and soil cover. This project will serve as a foundation for monitoring for the Forest Vegetation Treatment/Water Quality Protection Handbook. None of this work will be done on property owned by NMP. This work will be managed by the NFD in coordination with IERS. Work will consist of hand thinning and then fuels chipping or burning. Small-scale mastication test plots over an area of 86 acres might also occur. This work will help fill important information gaps regarding fuels treatment impacts on soil conditions and will reduce life and habitat-threatening wildfire potential.

Nexus Discussion

Nexus to Violations

During the summer and fall of 2006, a number of technical violations were noted and notices of violation issued by LRWQCB staff on NMP projects within the Northstar area. During November of 2006, turbid discharges related to technical violations were noted and a Clean Up and Abatement Order was issued by the LRWQCB. The extent of discharge and impacts to water bodies is difficult to ascertain but it is clear that turbid water entered Martis Creek. The vast majority of violations prior to November were technical in nature. This SEP project is designed to offset impacts to beneficial uses through 1) direct improvement to the Martis Creek watershed and 2) development of two handbooks that will assist other developers and land managers in understanding the technical nature of erosion potential and to implement watershed protection and improvements projects.

IERS and NMP developed and produced a SWPPP Handbook in 2007 that went “above and beyond” water quality BMP requirements. This handbook was developed in direct response to a lack of clear understanding by contractors and contract managers of the requirements and implications of water quality regulations. This lack of understanding has been noted across the construction industry. While the SWPPP Handbook is not part of this SEP project, it served to offset the lack of understanding by construction personnel at Northstar in 2006 and demonstrates NMP’s desire to improve the effectiveness of their water quality protection efforts. The SWPPP Handbook is available and has been distributed by LRWQCB staff to other dischargers in the Lahontan region. The SWPPP Handbook serves as an example of the two handbooks that are proposed as part of this SEP project. The impetus of these handbooks is to translate experience gained in achieving watershed protection and improvement into information widely available and useable by others.

Further nexus to violations are shown through reduction of catastrophic wildfire potential in the Northstar at Tahoe property through reduction of potential for sediment deliver to Martis Creek. Catastrophic wildfire is known to create site

conditions that result in a great deal of sediment delivery to nearby waterways. The middle fork of Martis Creek is surrounded by an overstocked forest which is a prime candidate for a wildfire, especially given the density of population and visitation in the region. This portion of the project will result in a probabilistic reduction in sediment yield. It is not a matter of whether a fire will impact this area but when. Further goals of the Northstar portion of this SEP include upland and riparian thinning for habitat values. 2006 violations included impacts to Martis Creek which likely impacted local riparian habitat, particularly near Highlands View Drive Station 144 bridge. In the Northstar portion of this project, habitat will be restored and enhanced in order to offset the impacts on 2006.

Nexus to other Regional Projects

The Waddle Ranch/Martis Creek Watershed Improvement Program is designed to be complementary to other projects in the Martis-Truckee region. For example, the TRWC has received funding (\$150,000) under Prop 50 IRWMP Implementation (as part of the Northern Sierra Partnership) for Truckee River TMDL monitoring. These efforts will be coordinated with the Waddle Ranch Watershed and Restoration Improvements through the TRWC.

Forest vegetation management efforts are increasing in intensity throughout the Lahontan Region. Preparation of the Forest Vegetation Treatment/Water Quality Protection Handbook entails the development of a Forestry Technical Group that will serve to coordinate this and other efforts beyond the Martis Valley. This handbook will include a set of guiding principles that can be used across the Truckee-Tahoe region as guidance for fuels reduction efforts that will focus on erosion protection.

The Middle Truckee River TMDL will include implementation of treatments to reduce sediment loading. TMDL implementation has been problematic in cases where clear guidance as to approach, goal setting, implementation and monitoring is not available. The Watershed Evaluation, Treatment, and Monitoring Handbook will provide this guidance.

Placer County and the Town of Truckee are in the process of developing Stormwater Management Plans. While Waddle Ranch is not an urbanized watershed, many of the assessment issues are similar. Further, source control approaches can be very similar between the two types of landscapes. This SEP project program will be coordinated with those efforts through the TRWC. Further, water quality monitoring efforts on the Middle Truckee River will be coordinated to the greatest extent possible with this SEP project, also through the TRWC.

Partners and Advisory Groups

All efforts within this SEP project will be coordinated with TRWC (who assisted in developing this description document and are primary collaborators), Lahontan Water Board, TDLT, TTAD, and other stakeholders as appropriate. A SEP Advisory Group will be formed to guide the entire SEP project. Additionally there will be two

additional technical advisory groups for the Watershed Evaluation, Treatment, and Monitoring Handbook and the Forest Vegetation Treatment/Water Quality Protection Handbook elements of the SEP project. The proposed membership and status of each group is listed in the table below. Potential member groups will be officially invited to participate once the SEP project has been approved by the Lahontan Water Board. The membership of the three groups will likely need to change from time to time. Such changes will be made through a nomination and consensus or 2/3rds vote agreement process and then with the approval of the Lahontan Water Board Executive Officer. It is intended that the SEP Advisory Group, Watershed Technical Group, and Forestry Technical Group will include the following members:

Group Name	Membership	Member Status
SEP Advisory Group	Lisa Wallace, TRWC Hayes Parzybok, NMP LRWQCB Staff (TBD), LRWQCB Perry Norris, TDLT Phred Stoner, TTAD Michael Hogan, IERS Dr. Susan Clark, Dynamic Competence (Facilitator-group development)	Voting, Paid Voting, Unpaid Voting, Unpaid Voting, Paid Voting, Unpaid Non-Voting, Paid Non-Voting, Paid
Watershed Technical Group	TRWC staff LRWQCB Staff (TBD), LRWQCB Dr. John Stanley Dr. Vic Claassen, UC Davis Cadie Olsen Randy Westmoreland, USFS Michael Hogan, IERS Dr. Susan Clark, Dynamic Competence (Facilitator-group development)	Paid member Unpaid member Paid member Paid member Paid member Unpaid member Paid member Paid member
Forestry Technical Group	Mary Huggins, CALFIRE Martin Goldberg, Lake Valley Fire Joe Barron, NFD Jeff Brown, Sagehen Research Station Michael Hogan, IERS Dr. Susan Clark, Dynamic Competence (Facilitator-group development) LRWQCB Staff (TBD), LRWQCB	Unpaid member Unpaid member Unpaid member Unpaid member Paid member Paid member Unpaid member

SEP Advisory Group Process

The SEP Advisory Group will consider and decide on major issues regarding the SEP project. Major issues include setting direction to the overall activities and tasks in the SEP project; specific construction projects; budget or task changes; and public relations items such as trainings, field work, etc. IERS will present suggestions for

various project elements to the SEP Advisory Group including construction project extent, location, and specific constructability elements. IERS will present the process of how and why various projects are put forward to the SEP Advisory Group. Construction project suggestions will be based directly on the watershed assessment and prioritization. The SEP Advisory group will be tasked with assuring that the intent of each task in this SEP is carried out in a transparent, responsible, and cost-effective manner. The SEP Advisory group will always attempt to reach consensus but if that is not possible, a 2/3rd majority vote will be required for action to be taken. At least 60% of the Advisory Group (quorum) must vote on an issue for it to carry. One major caveat to this process is that the TTAD has full veto power over any decision that may affect their management responsibility or direction. Further, TDLT has full veto power over any action or activity that may affect their responsibility as the Conservation Easement holder or that may impact their activities on the property.

Technical Advisory Group Process

The two Technical Advisory Groups will function as technical advisors and will not be responsible for making management decisions. However, their advice and suggestions will be brought forward to the SEP Advisory Group. The purpose of the Technical Advisory Groups is to offer the highest level of technical input in order to produce technical documents and implement processes with the highest level of technical competence possible. Technical input will be tracked and made available to the SEP Advisory Group so that suggestions put forward can be understood and supported technically.

These core members within each group will collaborate with other team members as needed to keep all programs and processes in alignment and as agreed to by group members during group role identification and development.

Part 3: Work Plan

Description of Key Tasks and Work Items

Work Item 1: Project Initiation

This work item will begin actual coordination of the SEP project with the appropriate parties.

1.1 SEP Advisory Group Development and Facilitation

A SEP Advisory Group will be formed and will offer input into the entire SEP project. In this process, we will clarify and agree on project goals and discuss steps needed to achieve those goals. The SEP Advisory Group will be a small working group that will also develop a strategy for keeping appropriate groups and individuals (stakeholders) connected to and apprised of the project.

1.2 SEP Advisory Group Meetings

We intend to hold three meetings per year for the life of this SEP project unless the SEP Advisory Group determines that we need either less or more meetings.

1.3 SEP Advisory Group Coordination

This work item encompasses coordination of the SEP Advisory Group between actual meetings and will entail such tasks as phone, email and web updates, coordination of group activities, concerns and discussions between meetings.

1.4 Review and Integration of Pertinent Martis Valley Projects

There are a number of planned and ongoing projects in the Martis Valley that may impact and/or be impacted by this project. This work item will include tracking and coordinating with those projects. Projects may include the Middle Truckee TMDL efforts, the Martis Valley and Middle Truckee Cumulative Water Quality efforts, other Waddle Ranch efforts (CA Resources Agency grant work, TRWC early TMDL implementation work, the Sierra Business Council (SBC)/IERS SSCH and ongoing TTAD/TDLT Waddle Ranch management work). These related efforts will be accounted for within our planning and implementation efforts to the greatest degree possible in an effort to eliminate redundancy and maximize efficiency. All work at Waddle Ranch and at Northstar will be done in full coordination with the landowners and will, in fact, be directed by those landowners within the context of the SEP project on any land management decisions, projects, or plans.

Work Item 2: Project Administration

2.1 Quarterly Progress Reports

IERS will produce quarterly progress reports and submit them to SBC by April 15, July 15, October 15, and January 15 for the duration of the SEP project. The quarterly report will include all activities undertaken and/or completed, cost tracking, minutes of meetings and other pertinent information for the previous quarter. SBC will, by April 30, July 31, October 31, and January 31 for the duration of the SEP project, review the quarterly report and submit it to the Lahontan Water Board.. Format of this report will be agreed to in advance by IERS, SBC, and the Lahontan Water Board staff so that it will contain necessary information in a format that is understandable, transparent, and acceptable to all parties. The following table lists the items that will be produced, who will complete them, and who will review them.

Task to be Completed	Responsible Party for Completion	Review Responsibility
Quarterly Tasks		
Description of all activities undertaken within the quarter, including draft products and photographs if necessary.	IERS	SBC
Invoice amounts for each task, summary of invoices to date, and percent complete of each task.	IERS	SBC
Minutes of public or advisory meeting.	IERS	SBC
Other pertinent information, which could include: --Correspondence --Specific direction provided by Advisory Group. --Permits --Other documents --Budget Modifications	IERS	SBC
Additional Items to be Reviewed		
PAEP	IERS	1. SEP Advisory Group (SAG) 2. SBC
Monitoring Plan	IERS	1. SAG 2. SBC
QAPP	IERS	1. SAG 2. SBC
Annual QAPP Report	IERS	1. SAG 2. SBC
Draft and Final SEP Project Report	IERS	1. SAG 2. SBC
Draft and Final of Watershed Evaluation, Treatment, and Monitoring Handbook	IERS	1. WTG 2. SAG 3. SBC
Monitoring Reports	IERS	1. SAG 2. SBC
Draft and Final Forest Vegetation Treatment/Water Quality Protection Handbook	IERS	1. FTG 2. SAG 3. SBC

2.2 Draft SEP Project Report

IERS will prepare a draft project report that will describe the work completed under this SEP project. The project report will include an introduction section, objectives of the SEP project, and a discussion of the relationship between this project to other related regional efforts and accomplishments both directly and indirectly related to the tasks and lessons learned from this project. The project report will also include the

task list and a brief description of task completion. This task includes submittal of the draft project report to the TDLT, SBC, NMP, TRWC, and LRWQCB staff for review and comment.

2.3 Final SEP Project Report

IERS will prepare and submit a final report within 60 days of receipt of the comments from the reviewers to SBC. The final report will include an appendix containing all comments received from the reviewers, and responses to those comments.

2.4 Project Coordination

This work item entails general coordination of each project element, coordination between project elements, and coordination between this SEP project and other partner groups. IERS and NMP recognize that coordination and high level communication will be critical to the success of the various elements of this project and thus this general task has been included to support that communication and coordination.

Specific tasks and actions that may be covered by this work item include coordination meetings, phone, internet and in-person meetings, and communication between partner groups as well as outside entities interested in assisting with this project. Since this project consists of three integrated but individual elements (as described in Part 1) that will likely play a role in other related projects in the Martis-Truckee-Tahoe region, adequate coordination will be crucial. A specific work item to cover requests for information sharing and presentations outside of Waddle Ranch-specific outreach and tours is not included.

2.5 Direct Overhead

Direct overhead will cover production of copies, travel expenses, and expenses related to direct project tracking.

Work Item 3: Project Assessment and Evaluation Plan (PAEP) and Quality Assurance Project Plan (QAPP)

3.1 PAEP Document

Prepare PAEP document per guidance on the State Water Board's website (http://www.waterboards.ca.gov/funding/paep_training.html) as the foundation for evaluating project performance, goal setting, indicators, and assessment.

3.1.1 Northstar PAEP & QAPP Integration

This item is included in order to integrate the Northstar Riparian and Forest Enhancement Project activities into the overall PAEP and QAPP.

3.2 PAEP Oversight and Documentation

Ensure coordination between activities and PAEP document, perform annual review and report of PAEP document and submit as part of quarterly report each March for previous year.

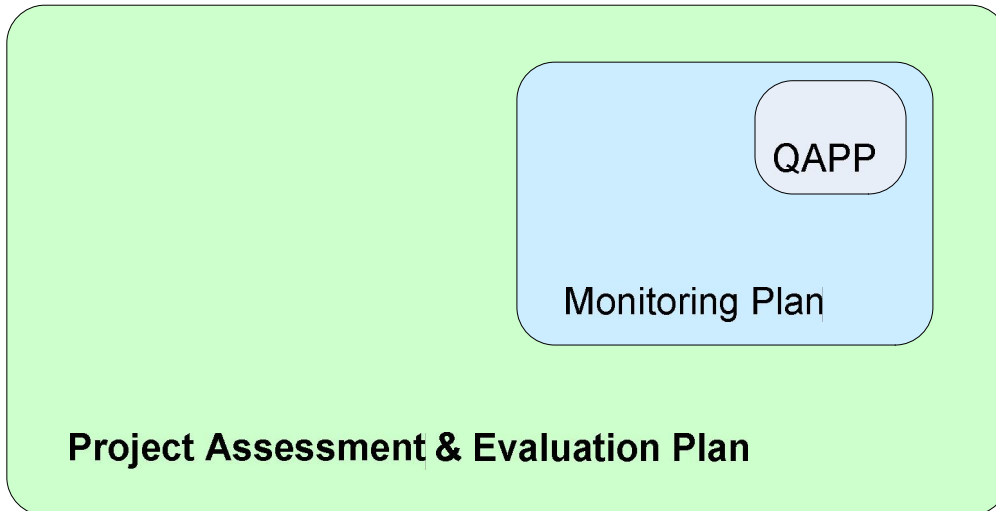


Figure 4: graphic representation of PAEP and its relationship to Monitoring Plan and QAPP per Water Board Guidance presentation.

3.3 Monitoring Plan

A table (PAEP Table) will be prepared that summarizes all project goals, desired outcomes, output indicators, outcome indicators, measurement tools and methods, and targets. A monitoring plan will be prepared that will describe in detail the specific techniques and methods used to assess project outcome against project goals. Baseline and performance monitoring will focus primarily on real-time, direct measurements of sediment source control effectiveness that have been developed by IERS, UC Davis, and others³. The methods are described below:

1. Simulated rainfall and runoff monitoring – simulators are used to induce either rainfall or runoff (overland flow) depending on site conditions. By simulating hydrologic events, we can directly measure runoff and infiltration rates and sediment yields (i.e. erosion) from treatment and reference areas.
2. Soil and vegetation monitoring – this package of monitoring measurements includes upland erosion parameters such as surface cover, vegetation species composition, soil moisture, soil density, soil physical characterization, soil nutrient content, and photo monitoring. These soil and vegetation measurements are a critical complement to the rainfall and runoff simulations described above, as they provide valuable information about the ecological sustainability of plant-soil systems, their ability to resist erosive forces, and their resilience following disturbance.

³ Grismer, M.E., C. Schnurrenberger, R. Arst and M.P. Hogan. 2008. Integrated Monitoring and Assessment of Soil Restoration Treatments in the Lake Tahoe Basin. Environ. Monitoring & Assessment. In-press.

The above-described monitoring methods were also used to develop the data for the Forested Upland section of the Lake Tahoe Basin TMDL Pollutant Reduction Opportunities Report.

Water quality monitoring stations will also be established along East Martis Creek above and below selected project locations. Grab samples will be collected at these stations at regular intervals. Collected water samples will be sent to a lab and analyzed for some or all of the following constituents, depending on season, stream flow, and previous monitoring results: total suspended sediment (TSS), particle-size distribution (PSD), total Kjeldahl nitrogen (TKN), total nitrate + nitrite, and total phosphorus (TP). Water quality sampling will allow us to assess the effects of various improvement projects on cumulative pollutant loading in the watershed.

The budget for preparing the Monitoring Plan is based on previous experience preparing defensible Monitoring Plans for other large-scale watershed restoration and monitoring projects in the Lahontan Region.

3.4 QAPP Preparation

Prepare QAPP as described on the State Water Board's website (<http://www.waterboards.ca.gov/swamp/qapp.html>) as adapted to this project.

Work Item 4: Waddle Ranch Restoration

4.1 Site/Watershed Evaluation (Erosion-focused Rapid Assessment or EfRA)

The site/watershed evaluation will be developed in order to rapidly assess actual and potential sediment source areas and other areas of degradation as they relate to water quality. Description of the purpose and general explanation of the site/watershed evaluation can be found in Work Item 5, below.

4.2 Environmental/Permitting Research, Background and Documentation

IERS will research and produce information necessary to determine which permits are needed for specific projects. IERS will also produce documentation and information required to obtain grading and ground disturbance permits as required.

4.3 Treatment Sites Identification

Use evaluation process to develop a prioritized list of projects based on parameters developed by the SEP Advisory Group and as agreed to by the TTAD Board representative.

Identify potential projects to be completed over the lifetime of the SEP project with estimated costs for each project.

Develop a working list of projects during grading prohibition period (October 15 through May 1) for the following construction season. The last year of the project, a list of recommended future projects for ongoing work at Waddle Ranch will be produced (to be undertaken after this SEP project is finalized).

4.4 Permitting Acquisition Assistance

IERS will work with and assist the Waddle Ranch owner (TTAD) to obtain permits as needed. This task item may also provide permit application funding to be used in conjunction with Landowner (TTAD) funding. Permit fees will be shared between this SEP funding source and the landowner at the direction of the advisory group.

4.5 Treatment Specifications

Develop treatment specifications for each restoration and treatment element of the SEP project and include those specifications in the year end and final Project Reports. Specifications will include methods, materials, success criteria, and monitoring to link success criteria to project goals.

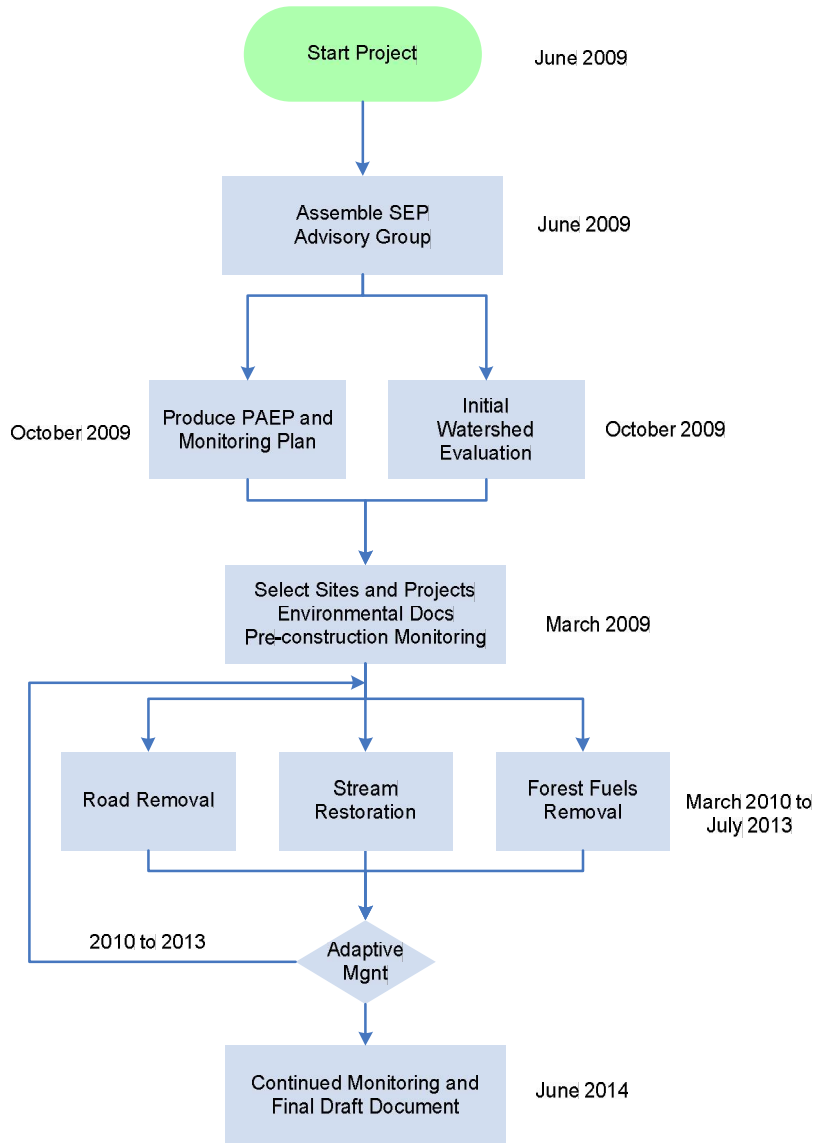
4.6 Pre-Treatment Site Condition Monitoring

Conduct functional, soil-vegetation-based monitoring including simulated rainfall or runoff monitoring, soil nutrient evaluation, cover point monitoring, and others as appropriate in order to assess the pre-treatment condition of treatment sites and to determine level of treatment required to achieve self-sustaining site conditions. This monitoring is focused on site conditions in order to assess potential for sediment delivery and site sustainability.

4.7 Water Quality Monitoring

Establish water quality grab sampling stations at three locations along East Martis Creek to characterize water quality conditions above and below project sites, evaluate the effects of treatments, and measure cumulative watershed sediment yield. Conduct regular and storm event grab sampling at grab sampling stations using trained staff throughout duration of project as defined in the Monitoring Plan. Sampling frequency will increase during spring runoff periods in order to characterize adequately sediment load during peak stream flow. Send collected water samples to lab for analysis as defined in the QAPP. The focus of water quality monitoring activities for this project is on sediment load. The intent is not to perform full parameter water quality monitoring as described in the Basin Plan or other related documents.

*Figure 5
Northstar Mountain Properties
Supplemental Environmental Project*



Waddle Ranch Restoration

4.8 Road Removal

Remove and/or repair selected roads in the Waddle Ranch that have been identified as sediment source areas. Roads have been shown to be the primary source of sediment in most disturbed watersheds such as Waddle Ranch. IERS has performed extensive road removal throughout the Truckee-Tahoe region and will base efforts on that work. Actual amount of square footage will be determined by the type of treatment required and difficulty of treatment sites. Product will be a slope or area re-contoured to original shape as much as possible or in the case of road repair, a road surface that has been designed per BMPs to result in minimum sediment production. Road removal work will be based upon other road restoration work designed and implemented by IERS, including the Ponderosa Ranch projects (2005-06), various USFS-funded projects (2002-2006) and Homewood Mountain Resort projects (ongoing).

4.9 Stream/Wetland Restoration

Restore stream and/or wetlands on Waddle Ranch property where needed and as identified in the watershed evaluation (EIRA, see Work Item 5). It is not possible to describe areas or acreage needing treatment prior to implementing evaluation and prioritization. However, initial site evaluation, discussion with the TDLT and Don Triplat, who produced the initial Forest Management Plan for the TDLT, indicate that several candidate areas exist that are in need of restoration. Exact amount of area treated will depend on difficulty of site, site conditions, prioritization process, etc. Treatments will be based on riparian/stream restoration and wetland restoration designed and/or implemented by IERS, including projects in the Tahoe Basin and three projects in the Martis Valley watershed (West Martis Stream Restoration and Golf Course TH-2 Wetlands Restoration).

4.10 Forest Vegetation Demonstration Treatments

Waddle Ranch forest vegetation demonstration treatments will be in collaboration with the Northstar Forest Enhancement portion of this SEP project. This work will be aligned with the Forest Vegetation Treatment/Water Quality Protection Handbook program (Work Item 6).

4.11 Post-Treatment Monitoring (per PAEP)

Conduct post-treatment effectiveness (performance) monitoring of restoration actions at Waddle Ranch using the same monitoring methodologies used in pre-treatment monitoring in order to ascertain relative change in soil function (potential for erosion) and vegetation on those sites. This information and data will be used in the PAEP reporting to determine success of treatments. Monitoring data will be compared to success criteria in order to provide a quantitative measure of success. The specific treatment and monitoring areas have not yet been determined.

4.12 Site Tours-Education and Technology Transfer

Provide six technology transfers site tours (\$3,000 for each tour). Tours will focus on restoration processes and efforts (2 tours), monitoring methodologies and results (2 tours) and the results of the watershed analysis (2 tours). There will be four workshops (\$5,000 for each workshop). The first workshop will be held twice and

will introduce and provide training in the monitoring methods developed. This workshop will allow local citizens and/or students to continue the monitoring program after the SEP project is completed. The third and fourth workshops will be held to introduce and provide training in the two handbooks developed under the SEP project (Watershed Evaluation, Treatment, and Monitoring Handbook program and the Forest Vegetation Treatment/Water Quality Protection Handbook). Tours and workshops will be developed with local non-profit groups to leverage knowledge and expertise.

4.13 Public Outreach Program and Materials

Develop and produce outreach and technology transfer materials (such as pamphlets, handouts, or newsletters) for self-guided tours and other outreach needs as identified by the SEP Advisory Group. Materials will include general information on Waddle Ranch ecology, values, and related site restoration activities. Two public interpretive signs will be developed and installed at Waddle Ranch to explain the resource values at Waddle Ranch and how visitors can protect those values.

Work Item 5: Watershed Evaluation, Treatment, and Monitoring Handbook

Currently, a large number of watershed assessment documents exist, such as EPA's Handbook for Developing Watershed Plans to Restore and Protect Our Waters⁴ and The California Watershed Assessment Guide and Manual⁵. These guides are prepared for watershed groups and agencies and are extremely useful. However, for land managers that are tasked with implementing erosion reduction practices on the ground with limited resources, these assessments can be extremely cumbersome or financially impractical. The **Watershed Evaluation, Treatment, and Monitoring Handbook** (Work Item 5), will provide a tactical, erosion-focused approach to watershed assessment and treatment. This assessment approach, referred to as "Erosion-focused Rapid Assessment" or EfRA, is designed to provide watershed and land managers with a direct, accessible, user-friendly, and cost-effective method to identify erosion source areas. That information will feed directly into plans and implementation of repair and restoration efforts.

The watershed evaluation itself starts with gathering applicable spatial data for Waddle Ranch and developing a Geographic Information System (GIS) map of the watershed showing pertinent elements such as roads, water courses, soils, vegetation and disturbed areas. Spatial analysis in GIS is then used to identify potential erosion "hot spots" such as road-stream crossings and areas devoid of vegetation. This map is then used as the basis for focused field investigations. During field verification of potential erosion issues, sediment sources are identified and mapped in greater detail. Site-specific plans for restoring each erosion source area are then developed within the context of that particular drainage. Projects are prioritized by severity and relationship to other sediment issues in

⁴ EPA 841-B-05-005, October 2005. United States Environmental Protection Agency, Office of Water, Nonpoint Source Control Branch, Washington, DC 20460

⁵ Shilling, Sommarstom, Kattleman, Wahsburn, Florshiem and Helnly, 2005. California Resources Agency and the California Bay Delta Authority

their respective drainages. Actual field projects and priorities are then developed for the watershed as a whole.

The need for this type of rapid and directed watershed assessment has been identified over several seasons through working with land managers, agency personnel, and other responsible parties. It has become clear that land managers often do not have a background in watershed, erosion, or soil processes. This constraint often limits effective planning, implementation, and oversight. As TMDL programs are implemented, clear and cost-effective assessment, implementation, and monitoring procedures will be critical to achieving the desired results of those programs. This **Watershed Evaluation, Treatment, and Monitoring Handbook** is designed to fill the need for such a process and procedure.

5.1 Watershed Technical Group Development and Meetings

A Watershed Technical Group (WTG) will be developed to guide this portion of the project. Invited WTG members (outlined in the Partners and Advisory Groups section above) have been chosen based on their involvement in watershed management issues and their understanding of the use and need for such a handbook. This group will be tasked with providing input and information into the process, and developing connections with watershed groups and other entities that need guidance in implementing and monitoring watershed improvement efforts.

5.1.1 Watershed Technical Group Review

Review and input to Watershed Evaluation, Treatment, and Monitoring Handbook by the WTG during development of the document.

5.2 Literature Summary

Conduct a focused review of relevant watershed assessment literature and methodologies and prepare a literature summary and bibliography. The purpose of conducting this literature review is to ensure that the watershed assessment methods used at Waddle Ranch build on the most current and effective approaches being employed in similar settings. Additionally, the literature summary will focus on identifying information gaps that may be able to be addressed in the Watershed Evaluation, Treatment, and Monitoring Handbook. Watershed assessment literature to be reviewed will include manuals and reports from the EPA, SWRCB, Resource Conservation Districts, and watershed groups throughout California and the West. The bibliography will be prepared in EndNote format. The draft literature summary and bibliography will be presented to the WTG for review before being finalized. This will be coordinated with other entities engaged in similar efforts (e.g. TERC/USFS-PSW) in order to avoid duplication of efforts.

5.3 Document Outline

Prepare a complete outline for the Watershed Evaluation, Treatment, and Monitoring Handbook that encompasses the elements put forth by the WTG.

5.4 Draft Document

Prepare and produce a draft document for review by the WTG and other technical reviewers as identified by the WTG.

5.5 Interim/Working Document

Prepare interim working document based on input from the WTG and other reviewers. This document will provide the basis of further work and will be used as a working field document for continued work at Waddle Ranch during the life of this SEP project. It may also be made available to other interested parties upon review and agreement by the SEP Advisory Group.

5.6 Document Iteration

Iterate and update document periodically, based on input from users and WTG.

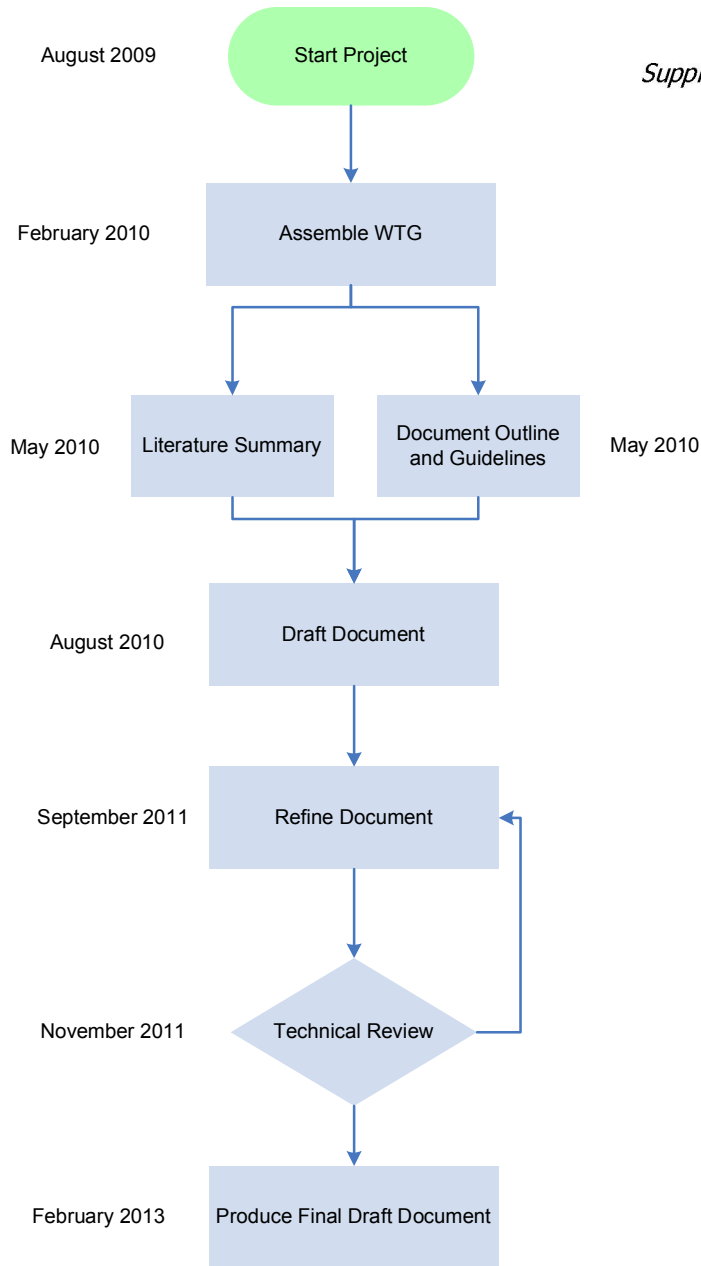
5.7 Final Document

Produce final document based on input from WTG and other users and technical input over the life of the document. Request for final input will be made to reviewers and users. Input will be incorporated when received within 30 days from time of request. Final draft will be produced within 60 days of receipt of input or no later than 90 days from request for input.

5.8 Document Layout and Printing

Professional layout of document, production of electronic copy (PDF file) and printing costs for 10 hard copies of the document will be completed. Other funding will be sought for additional printing as needed.

*Figure 6
Northstar Mountain Properties
Supplemental Environmental Project*



Watershed Evaluation, Treatment and Monitoring Handbook

Work Item 6: Forest Vegetation Treatment/Water Quality Protection Handbook

This portion of the SEP project is designed to fill a critical gap in knowledge and process related to forest vegetation treatments and their impacts on water quality. This program is designed to build a bridge between forest vegetation treatment and the protection of water quality during and following those treatments. Lahontan Water Board and fire agency staffs have been vocal supporters of developing such a program, based on the SSCH. The handbook produced from this work item will provide land managers/ potential dischargers with much-needed guidance to help them plan, implement and monitor their fuels treatment projects. The overall program, which will eventually extend beyond the Waddle Ranch and Martis Valley, is intended to produce a set of tools that land managers can use for fuels treatment that offers a quantifiable erosion-related outcome and where needed, mitigation treatments that will minimize or eliminate impacts to water quality. The tools, or toolkit, portion of the handbook provide in-depth technical information designed to complement the over-arching guiding principles that will be documented in the handbook.

6.1 Forestry Technical Group Formation

Form a Forestry Technical Group (FTG) comprised of representatives of the following entities: LRWQCB, California Department of Forestry, Tahoe Fire Chiefs Association, NFD, and a citizen representative. Specific invitees are outlined in the Partners and Advisory Groups section above. (Note: this group is separate from both the overall SEP Advisory Group and the WTG.) This group will be tasked with ensuring that the project is focused on identified needs and that effective communication occurs with appropriate groups and individual stakeholders in order to maximize information sharing and technology transfer. Further, this group will work to make sure that this program is aligned with other existing forestry and fuels management programs and efforts in the region. Formation of this group includes the development of key agreements that identify the goals and outcomes of this effort (charter) through a facilitated process. This group will also advise the treatments by the Northstar Community Services District (NCSD) in Work Item 7.

6.2 Forestry Technical Group Meetings

Convene FTG meetings twice per year through the term of the SEP project.

6.3 Literature Summary

Conduct a focused review of literature that pertains to assessing and mitigating the impacts of fuels treatments on soil and water quality and prepare a literature summary and bibliography. The purpose of conducting this literature review is to identify promising treatment methodologies as well as information gaps. This literature summary will serve as the primary basis for selecting specific fuels treatments and mitigation measures to be tested at Waddle Ranch and/or Northstar. The literature summary will also be used to define the scope and content of the Forest Vegetation Treatment/Water Quality Protection Handbook. The draft literature summary and bibliography will be presented to the FTG for review before being finalized. Other related literature review efforts currently underway will be incorporated or included wherever possible. IERS has been coordinating with the USFS Pacific Southwest

Research Station, the UC Davis Cooperative Extension and the Tahoe Science Consortium on several recent and current literature reviews. Literature will continue to be incorporated until year three of the project or further if budget allows and as directed by the FTG. The bibliography will be prepared in EndNote format. The literature summary will be produced in hard copy and as a CD-ROM. It will also be made available as a web posting on either the TRPA TIIMS website, the LRWQCB site, and/or a number of other fire-related sites as directed by the technical group and as budget allows.

6.4 Develop Draft Handbook Outline and Guiding Principles

Develop a draft Handbook outline and guiding principles for the final document based on input from the FTG.

6.5 Identify Treatment Options

Based on literature review and coordination with management agencies, develop a list of all potential treatment options that may be used on Waddle Ranch and Northstar. Create a priority treatment list in conjunction with the FTG. The types of treatments chosen will be based on those treatments that represent the most promise from a cost-effectiveness standpoint and the largest knowledge gap relative to impacts on water-quality/sediment production.

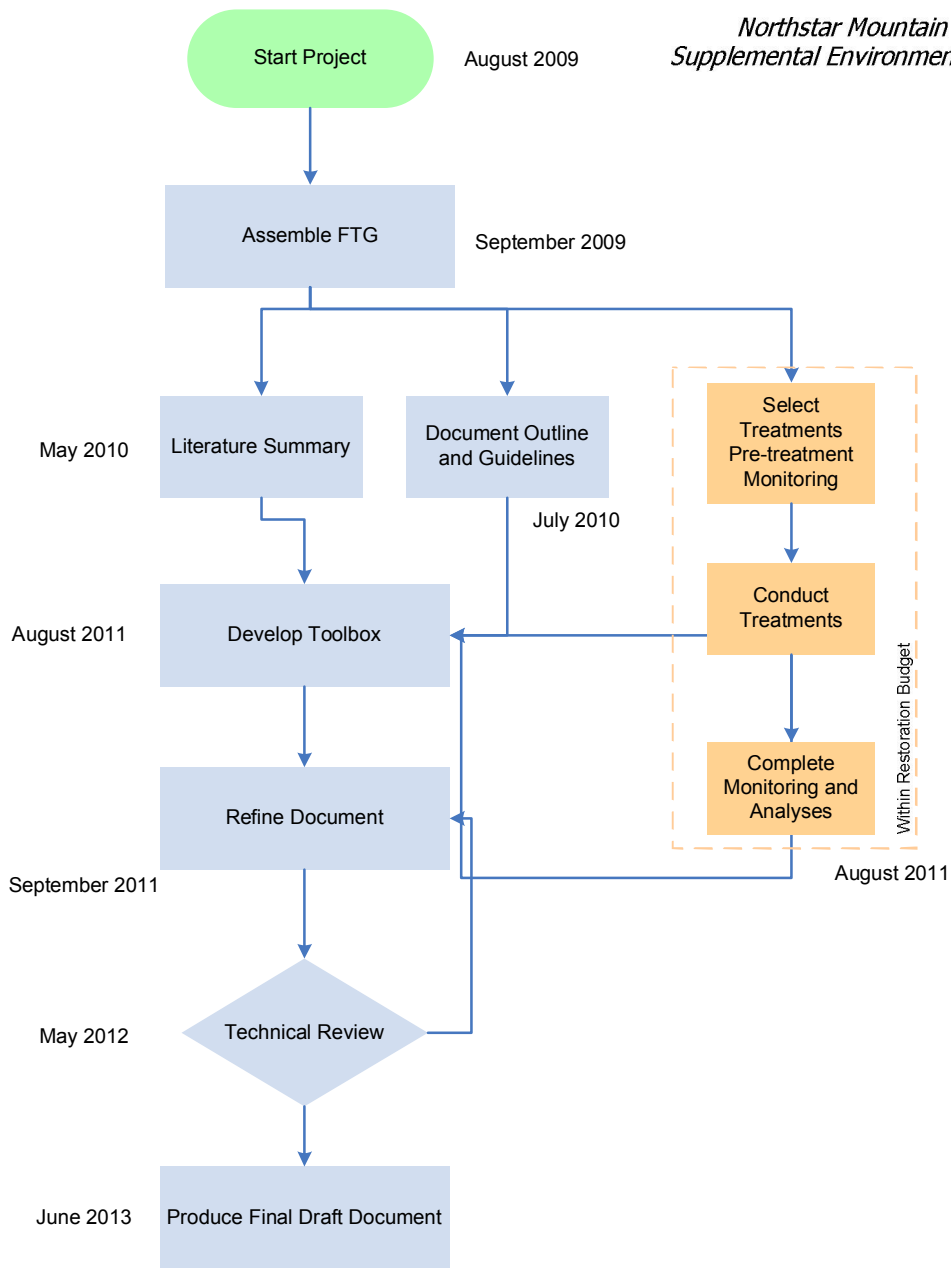
6.6 Forest Vegetation Reduction Treatment Implementation (research plots)

As identified in 6.5, above, select four treatments and apply those treatments to small (<1/2 acre) areas of Waddle Ranch in order to develop treatment types to monitor.

6.7 Develop Working Draft Forest Vegetation Treatment/Water Quality Protection Handbook

Develop working draft of the Forest Vegetation Treatment/Water Quality Protection Handbook. This work item will produce a format/template for the Toolkit section of the Handbook and will include at least four specific fuels reduction tools with related water quality impacts and mitigation measures. Tools may consist of such practices as pile burning, broadcast burning, mastication, forwarding, and mitigation of specific treatment effects. Related water quality impacts may include such elements as soil compaction, change in infiltration rate, runoff volume changes, runoff constituents, effects on vegetation, effects on soil nutrients, etc.

Figure 7
 Northstar Mountain Properties
 Supplemental Environmental Project



**Forest Fuels Treatment/Water Quality
 Protection Guideline Project**

6.8 Monitor Treatments

Treatments shall be monitored both pre and post treatment using methodologies described in the Monitoring Plan (see Task 3.3 for a description). There is a large disparity between the cost of the monitoring compared to the amount of fuels treatment work between Waddle Ranch and Northstar. This is because the monitoring that will be conducted at Waddle Ranch is intensive, research-level monitoring that is intended to support lower resolution monitoring at Northstar. High-intensity monitoring helps to understand better the full range of impacts associated with a given treatment and is more defensible (i.e. high confidence level). This helps to identify the most sensitive parameters, which can then be measured discretely at other sites (such as Northstar) through lower-intensity monitoring methods and used to infer the full range of impacts.

6.9 Distribution Copy - Forest Vegetation Treatment/Water Quality Protection Handbook

Produce a distribution copy of the Forest Vegetation Treatment/Water Quality Protection Handbook and distribute to the FTG for review. The document will also be provided for additional technical review as suggested by the FTG. Note: the actual number of ‘tools’ included in the Handbook under this SEP project will depend on budget and management constraints at Waddle Ranch and Northstar and the potential to develop partnerships with other fuels managers.

6.10 Final Draft Forest Vegetation Treatment/Water Quality Protection Handbook

Incorporate review comments and produce a final draft version of the Forest Vegetation Treatment/Water Quality Protection Handbook. This final draft will be produced in year four (2012) of this SEP project. The document will be provided electronically on compact disk (CD ROM) to interested parties as suggested by the FTG.

6.11 Printing and Distribution of the Forest Vegetation Treatment/Water Quality Protection Handbook

It is not currently intended that the funding for the layout and printing of this document will be covered under this SEP project. Other entities in the Truckee-Tahoe region have expressed commitment to this program. Some of these other entities will request funding for final layout and printing of this document. This step-wise development of a document was very successful during the development of the SSCH.

Work Item 7: Northstar Riparian and Forest Enhancement Project

This portion of the project is designed to enhance riparian and forest vegetation within the Martis Creek watershed and to reduce forest fuel loading in areas that have had very little or no forest management for many years. This element of the SEP project is designed to improve wildlife and cold freshwater habitat associated with the riparian areas and to reduce large wildfire potential and thus minimize the erosion that would result from such an event. This work will also be used as a portion of the monitored work

that will form the foundation of the Forest Vegetation Treatment/Water Quality Protection Handbook. Increasing encroachment of white fir (*Abies concolor*) and overstocking of other species has altered fuel profiles and has created an overabundance of live and dead fuels. In addition, conifer encroachment has suppressed native riparian species such as Quaking aspen (*Populus tremuloides*) which is a declining tree species in North America. Removal of fire adapted species in non-fire adapted areas will help reduce the potential loss of these areas if a catastrophic wildfire were to occur and help forested and riparian areas flourish where they have been suppressed.

7.1 Permitting and Notification

Complete all required permitting and notifications prior to and following site preparation and fieldwork. This will include the following elements as required by the State of California and the County of Placer:

- California Forest Practice Rules (1038 Exemption).
- California Regional Water Quality Control Board (Category 6 Project if needed).
- Archaeological Records Check Request.
- Notification to local Native American Indian Tribes.
- Placer County Air Quality/Burn Permit (will be written and submitted following hand crew work).

7.2 Pre Treatment Monitoring

Site conditions will be assessed before implementation of fuels reduction treatments. This will include field and office work consisting of the following:

- Average stand density measurement of conifers (timber stand inventory and established photo points).
- Visual measurement of fuel amounts on the forest floor using USFS Photo Series for Quantifying Forest Residues in the Sierra Nevada, and establish photo points.
- Wildfire fuels model (wildfire simulation by computer model).
- Visual measurement of Quaking aspen (*Populus tremuloides*) species prior to treatment and at year five of treatment by established photo points.
- Measurement of white fir (*Abies concolor*) species in riparian areas to study hydrological impacts. This will be done by an inventory and established photo points.

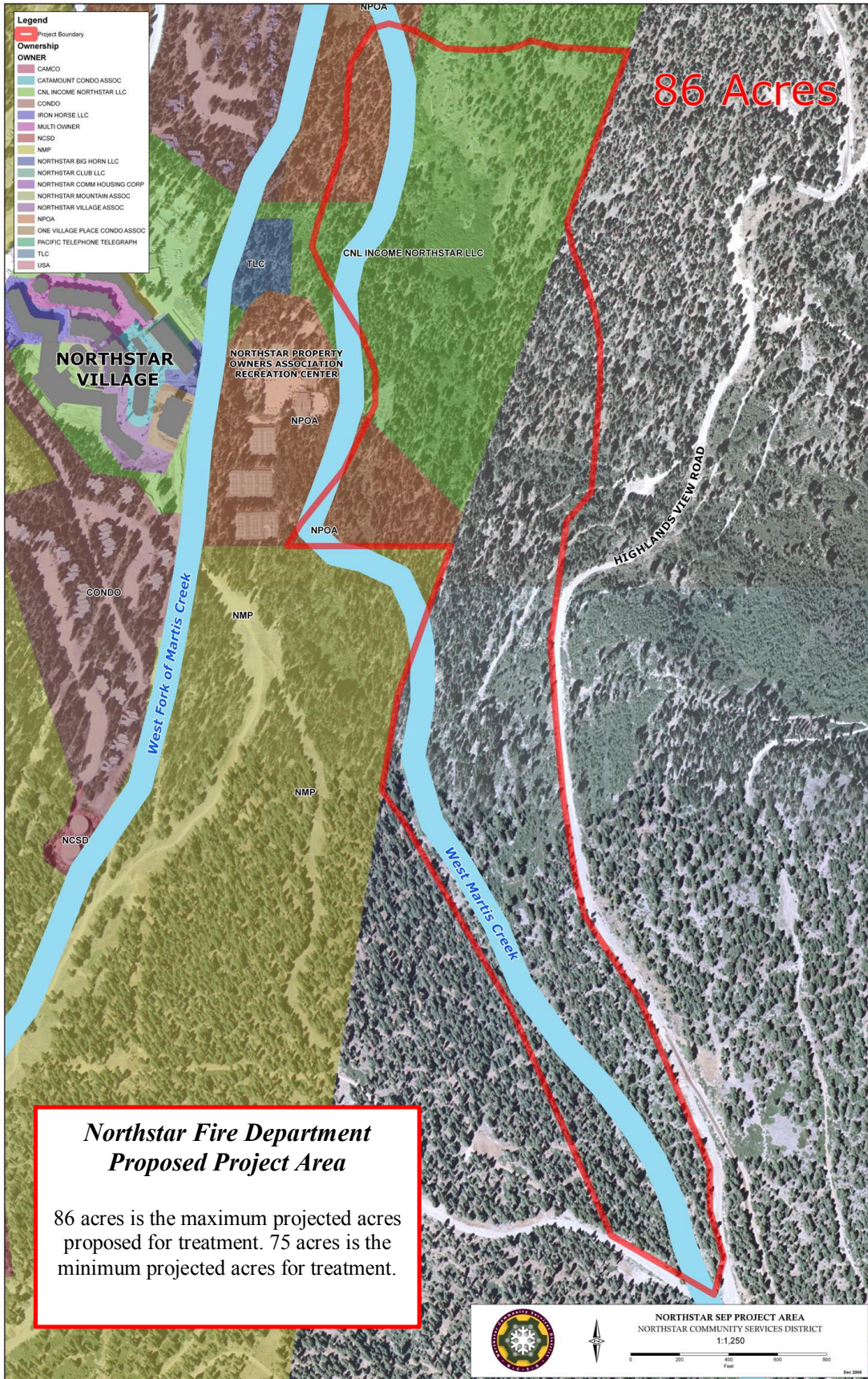


Figure 8. Northstar Riparian and Forest Enhancement Project Map

7.3 Field Work (Site Preparation)

Preparation of fieldwork will involve flagging and timber marking. A detailed description is as follows:

- Project boundary areas indicated in orange flagging.
- Watershed and Lake Protection Zone (WLPZ) areas will be delineated/flagged in white and blue striping. Protection measures from hand crews, tree falling, pile burning, and chipping will be implemented in those areas.
- Sensitive areas (Historical, archaeological, wildlife, or vegetative related) will be flagged in black and yellow striping. These will be exclusion zones from the project.
- Tree removal (live or dead) marking indicated on each tree to be removed with a blue band (completely encircled) at DBH (Diameter breast height) 4.5 feet above ground. Various snag classes to promote healthy habitat for woodland creatures will be marked with a “W” in blue marking paint.

7.4 Hand Crew Work (Treatment)

A designated hand crew consisting of 6 to 15 trained individuals will be utilized to perform the project work tasks as follows:

- Remove live and dead conifer and deciduous trees ranging from 2-24 inches in diameter.
- Limb live conifer trees 2 feet for trees 2-4 inches at DBH, limb trees 4 feet for trees 6-10 inches at DBH and limb trees 6 feet at 12 inches at DBH or greater.
- Compile excessive downed and dead material, tree cuttings (limbs and wood lengths) into burn piles no larger than 8 x 8 feet and placed in moderate to open areas in order to minimize live tree scorch. Feeder piles may be required to facilitate this process.
- Strategically place various wood lengths (live and dead) to enhance downed woody debris classes in order to create corridors for small mammal species, and to provide for varying stages of soil decomposition rates.

7.5 Hand Crew Work (Chipping)

Chipping will be completed where applicable by a remote controlled rubber track chipper. It will be used in areas where a duff layer 3 inches or less on average is present. The machine will be operated by a three man crew consisting of a chipper operator, and two ground crew members who will collect the material and feed the chipper.

7.6 Hand Crew Work (Pile Burning)

- Pile burning will be performed in the late fall/winter/early spring months where an appropriate snow amount (6 inches or more) is on the ground or where vegetation and soil moisture are adequate to ensure that fire will not

spread. Proper notification to regulatory agencies, test pile burning, and tending to piles prior and following pile burning will be observed. Pile burning will be performed by experienced and knowledgeable personnel.

- Pile mitigation measures will be implemented in coordination with the Forest Vegetation Treatment program in order to ascertain recovery rates from pile burning using various mitigation measures.

7.7 Mastication

If funding allows, a tracked excavator with a masticator head mounted on the boom will be used to implement fuels reduction treatments as part of the Northstar Riparian and Forest Enhancement Project in order to evaluate as wide of a range of vegetation treatments as possible. If mastication is not deemed to be an appropriate treatment for the areas being treated as part of the Northstar Riparian and Forest Enhancement Project, an effort will be made to implement mastication as part of fuels reduction treatments at Waddle Ranch instead. Evaluation of less common vegetation treatment methods will support the development of a more complete “toolkit” for the Forest Vegetation Treatment/Water Quality Protection Handbook. While no funding is currently allocated for this work item in the budget, it is expected that a small amount (2-4 acres) of mastication will be able to be funded from cost savings in other work items or from contingency funds.

7.8 Project Inspections and Forestry Management

Project inspection will be performed by the NFD Forestry Supervisor throughout the project’s five year timeframe. Inspections will be done a minimum of two times per day to ensure quality control and that state regulations are being followed. Inspections will consist of the following:

- All trees marked have been removed and a stump height no greater than 6 inches (where possible) is achieved.
- All areas that are flagged for boundary and protection measures are being respected.
- A daily recording of acres treated, burn piles created (pile size dimensions and projected emissions of PM¹⁰/pile). In addition, visual estimations of material chipped in cubic yards will be collected and entered into the NCSD Fuels Management Database.

7.9 Post Treatment Monitoring and Reporting

Project monitoring from Item 7.2 (Pre Treatment Monitoring) will be conducted annually. Actual implementation of various fuels reduction treatments will be mapped and quantified (in acres) after the work is completed. Monitoring will be conducted to assess relative changes in vegetation. This information and data will be used in PAEP documentation to determine success of treatments. Monitoring data will be compared to success criteria in order to provide qualitative measures of success. Monitoring will consist of soil and vegetation monitoring and water quality monitoring using existing water quality monitoring stations. These data sources will provide a baseline and will be compared with post project water quality data in order to assess differences. Post-

treatment monitoring tends to be more time-consuming and thus, more expensive, due to the variability following treatment.

A complete description of monitoring activities and metrics will be provided in the PAEP, QAPP, and Monitoring Plan documents.

Work Item 8: Project Implementation and Monitoring Contingency

Approximately \$42,100 has been set aside as a contingency over the five year lifecycle of this SEP project. Given the long lifecycle of this project and given the many variables and complex elements of this SEP project, both known and unknown, this contingency is believed to be adequate to provide for unknown issues that may arise. Contingency will only be allocated as requested by IERS on behalf of NMP if approved by the SEP Advisory Group, SBC, and the LRWQCB Executive Officer or designee assigned to oversee this SEP project.

All SEP Fund monies shall be distributed before June 30, 2014, unless the schedule for the SEP project is extended as provided below. Any funds remaining in the SEP Fund as of June 30, 2014, or the time for completion of the SEP project as extended below, will be paid to the State Water Board's Cleanup and Abatement Account (80%) and the State Water Board's Waste Discharge Permit Fund (20%) (or other fund(s) that the applicable California Water Codes directs payment to at the time). NMP may make a written request to the Executive Officer to extend any SEP project deadline by up to one year for good cause. The Executive Officer may approve extensions of the SEP project of up to one year, which approval shall not be unreasonably withheld. The LRWQC Board may in its discretion approve an extension of more than one year for implementation of the SEP project, if requested in writing by NMP.

General

Transfer of funds between and among work items

Given the nature of this project and the uncertainty at this point regarding exactly where and how much restoration work will be done, and in an attempt to accurately and reasonably target costs, the following guidelines for funding allocation will be adhered to:

Wherever specific work items do not use all funds allocated to that work item, those funds will be: 1) reallocated within the overall work item, or 2) reallocated to field implementation wherever possible. If a particular work item is underfunded, reallocation may occur if approved by the SEP Advisory Group, SBC, and the LRWQCB Executive Officer or designee assigned to oversee this SEP project. In any event, the cost of the work items and work in total will not exceed the total budget of this SEP project.

Finalization of task and work items

This project, if approved, will be planned during the spring of 2009. Specific elements of work items will be finalized by field assessment and site visits. The current plans have been developed in cooperation with individuals who are familiar with Waddle Ranch, including TDLT, TTAD, Don Triplat, Gerald Rockwell, and others, and the plans can be considered as accurate as possible.

Part 4: Project Team and Administration

The project team, the technical groups and the advisory group are well balanced in background and capabilities. Given the nature of Waddle Ranch ownership, as well as the nature of water quality monitoring in the Martis Valley, the project team includes members that can guide implementation of the elements of the proposed SEP project.

- Lisa Wallace: The TRWC is the main watershed coordination group in the Truckee region and is involved in many of the watershed efforts that are underway.
- TTAD Staff Dave Gotschall and Phred Stoner
- NCSD Fire Department Staff, Chief Mark Shadowens or Joe Barron
- Perry Norris: The TDLT holds the Conservation Easement on the Waddle Ranch property and is also involved in many of the watershed efforts occurring in the Truckee region.
- IERS has a track record of successful planning, implementation and monitoring of environmental restoration and improvement projects throughout the Tahoe Truckee region and has a solid history of cooperative work with the LRWQCB, TRWC, Placer County, and TDLT. IERS team members include:
 - Michael Hogan, MS, Soil Scientist, Restoration Specialist, Principal
 - Jerry Dion, MS, Ecologist, GIS Specialist
 - Kevin Drake MS, Planner, Associate Project Coordinator
 - Don Triplat, BS, Forestry, Restoration Coordinator
 - Rachel Arst, MS, Environmental Engineer, Monitoring Coordinator
 - Gerald Rockwell (USGS, Ret.) Water quality monitoring, associate

The IERS team will be supplemented as needed. IERS consists of over 20 individuals and four work groups (Planning, Implementation, Monitoring/Research, and general Consulting) which provide adequate resources to complete most of the tasks involved in this SEP project.

- Dr. Mark Grismer, Ph.D, UC Davis, Consulting Research Associate, Hydrology and Environmental Engineering. Dr. Grismer has teamed with IERS on a number projects including the Forested Upland element of the Lake Tahoe Basin TMDL

Pollutant Reduction Opportunities Analysis and Report. He will help develop monitoring plans.

- Dr. Susan Clark, Ph.D, Dynamic Competence. Dr. Clark will serve as a process facilitator to ensure high-level communication and coordination occurs between the project partners and outside stakeholders.

Third Party Oversight

Third Party Oversight will be provided by SBC. Specific arrangements will be made during or immediately following the finalization of this agreement. Steve Frisch (530.582.4800) has been contacted and has agreed to provide this oversight. SBC is well-suited to provide these services because the SBC is already providing similar services for a SEP project in the Victorville area and has been working as liaison and contact administrator for the 319 grant-funded Ski Area Erosion Control Guidelines project with IERS and the LRWQCB.

Part 5: Deliverables Table

The deliverable dates are based on a June 1, 2009 project start date. That assumption is based on the possibility that this SEP project will be approved at the March LRWQCB meeting and that contracting and finalization of the project agreements will take an additional two months. If another start date is implemented, due dates will be revised and adjusted accordingly.

Deliverable	Work Item	Due
Meeting agendas, Notes, Minutes of advisory group, Membership list, etc.	1.1-1.4	30 days following end of each quarter, through project life
Quarterly reports, draft and final report.	2.1-2.3	30 days following end of each quarter, through project life Draft format and outline, Feb 2013 Final, Feb 2014
PAEP table, supporting PAEP document, monitoring plan, and QAPP documentation.	3.1-3.4	October 15 th , 2009
Ongoing: yearly PAEP implementation report	3.2	January 30 th of each year
Watershed Evaluation summary document	4.1	Sequential, each

Deliverable	Work Item	Due
		season by July 30th. See budget. Bulk of effort in yrs 1, 2
Project designs and environmental documentation	4.2-4.4	Design: February prior to construction season, Environmental Doc: Each year, by 60 days prior to construction
Completed Treatments	4.5-4.11	Oct-Nov 2010, 2011, 2012, 2013. Work is dependant on weather and season
Monitoring reports	N/A	Feb 2012, 2013, 2014
Public Outreach and Tours	4.12-4.13	By November 2010, 2011, 2012
Draft Watershed Evaluation, Treatment, and Monitoring Handbook	5.2-5.4	December 2010
Final Watershed Evaluation, Treatment, and Monitoring Handbook	5.5-5.8	December 2013
Group minutes, agreements, goals, and outcomes documentation	6.1-6.2	30 days following end of each quarter, through project
Literature report in CD-Rom format	6.3	February 2009 and updated where appropriate
Draft copy Forest Vegetation Treatment/Water Quality Protection Handbook	6.7	December 2008 - Feb 2009
Treatment options documented	6.5	August 2008, 2009
As-builts for test treatments		December 2010, 2011

Deliverable	Work Item	Due
Draft toolkit document		Feb 2010, 2011
Monitoring report		Feb 2010,11,12
Review copy, Forest Vegetation Treatment/Water Quality Protection Handbook	6.9	December 2011
Final draft, Forest Vegetation Treatment/Water Quality Protection Handbook	6.10	March 2012
Distribution of Forest Vegetation Treatment/Water Quality Protection Handbook	6.11	June 2012-2013
Forest Enhancement Project Permitting and Notification	7.1	July 2009
Pre-treatment Monitoring	7.2	September 2013
Field Work	7.3-7.7	October 2013
Project Inspections	7.8	October 2013
Post-treatment Monitoring	7.9	October 2013
Project Implementation and Monitoring Contingency	8.0	June 2014

Cost Estimate and Budget

See:

Attachment 1: Gantt Chart

Attachment 2: SEP Project Budget

Attachment 3: Waddle Ranch Water Quality Monitoring Costs

Attachment 4: SEP Advisory Group Costs

Attachment 5: Watershed Technical Group Costs

Attachment 6: Forestry Technical Group Costs