

Appendix B-8

**LAKE TAHOE RESTORATION PROJECTS
ESTIMATED NECESSARY EXPENSES & KEY MILESTONE DATES**

Project Name: Restoration of Rosewood Creek, Area A Agency: Bureau of Reclamation
 Prepared by: Scott Brown, NTCD Phone: 775-586-1610 x31 EIP #: 562
 SNPLMA Project #: _____

Identify estimated costs of eligible reimbursement expenses:

1. Planning, Environmental Assessment and

Research Costs (specialist surveys, reports, monitoring, data collection, analysis, NEPA, etc.)

\$ 261,600 9.8 %

2. FWS Consultation—Endangered Species Act

\$ 0 0 %

3. Direct Labor (Payroll) to Perform the Project

\$ 243,290 9.1 %

4. Project Equipment (tools, software, specialized equipment, etc.)

\$ 1,200 0.0 %

5. Travel (including per diem where official travel status required to carry out project, such as serve as COR, experts to review reports, etc.)

\$ 0 0 %

6. Official Vehicle Use (pro rata cost for use of Official Vehicles when required to carry out project)

\$ 2,616 0.1 %

7. Cost of Contracts, Grants and/or Agreements to Perform the Project

\$ 1,775,046 66.8 %

8. Other Direct and Contracted Labor: Agency payroll for the Contracting Officer to do project procurement, COR, Project Inspector, Sec. 106 Consultation if required, NEPA Lead, Project Manager, Project Supervisor, and subject experts to review contracted surveys, designs/drawings, plans, reports, etc.; Also covered is the cost to contract for a Project Manager and/or Project Supervisor if contracted separately from other project contracts)

\$ 387,000 14.5 %

9. Other Necessary Expenses (See Appendix B-11)

\$ _____

TOTAL: \$ 2,670,730 100 %

Estimated Key Milestone Dates:

Milestones/Deliverables:	Date:
100% design documents, specifications, and bid documents	December 2009
Construct and vegetate new channel	October 2010
Introduce flows to new channel, fill, and revegetate	October 2011
Final Completion Date:	December 2011

COMMENTS:

Direct labor costs include construction contract management by NTCD and Washoe County, project management by NTCD, construction-related water quality monitoring and reporting by NTCD, and design and technical oversight management by NTCD.

ROUND 10 CAPITAL PROJECT NOMINATION FORM
LAKE TAHOE FEDERAL SHARE EIP CAPITAL PROJECTS
APPENDIX K

Project Name: Restoration of Rosewood Creek, Area A

Federal Agency Sponsor: Bureau of Reclamation

Contact: Scott Brown (Nevada Tahoe Conservation District (NTCD))
 Myrnie Mayville (Bureau of Reclamation)

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 (775) 589-5240 (Myrnie Mayville, BOR)

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Thresholds: Water Quality, WQ-4, Tributaries
 Soil Conservation, SC-2, Stream Environment Zones
 Fisheries, F-2, Stream Habitat

Threshold Standard:

WQ-4: TRPA threshold numeric standard: Attain applicable state standards for concentrations of dissolved inorganic Nitrogen (DIN), dissolved phosphorous (DP), and dissolved iron. Attain a 90th percentile value for suspended sediment concentration of 60 mg/L. Interpreted state standards: California: total nitrogen (0.15-0.22 mg/l), total phosphorus (0.010-0.030 mg/l), and total iron (0.015-0.03 mg/l), (annual average.); Nevada: Lake Tahoe standards for soluble phosphorus not to exceed 0.007 mg/l (annual average.); soluble inorganic nitrogen not to exceed 0.025 mg/l (annual average.). **Non-attainment.**

SC-2: Restore 25% of stream environment zones in urban or disturbed areas to attain a 5% increase in naturally functioning SEZs. **Non-attainment.**

F-2: Maintain 75 miles of excellent, 105 miles of good, and 38 miles of marginal stream habitat as indicated by the map on page 76 of the EIS for the Establishment of Environmental Thresholds (TRPA 1982b). **Attainment is unknown** because no data has been collected since 1986.

Total Project Cost: \$3,379,830 (Includes approximately \$709K of prior efforts)

<i>Item Description</i>	<i>Value</i>
Middle Rosewood Creek Geomorphic and Riparian Assessment (2005, BOR)	\$ 65,000
Middle Rosewood Creek Preliminary design (2005, BOR)	\$ 110,000
Rosewood Creek Area F Restoration Design (10% of total cost) (2007/2008, BOR)	\$ 69,100
Rosewood Creek Area A 90% Restoration Design (2008, BOR)	\$ 465,000
TOTAL	\$ 709,100

Funding Requested in this Round: **\$2,670,730** (includes \$896K in design and oversight, and \$1,775K for construction)

<i>Item Description</i>	<i>Value</i>
Generate final design documents, permits, and bid documents	\$ 261,600
Engineering oversight	\$ 327,000
Project and program management, construction monitoring	\$ 243,290
Bureau of Reclamation contract oversight	\$ 60,000
Mileage and Equipment	\$ 3,787
TOTAL	\$ 895,677

<i>Item #</i>	<i>Item Description</i>	<i>Unit</i>	<i>Unit Cost</i>	<i>Year 1</i>		<i>Year 2</i>		<i>TOTAL Value</i>
				<i>Quantity</i>	<i>Value</i>	<i>Quantity</i>	<i>Value</i>	
1	Mobilization / Demobilization	LS	\$125,000	0.75	\$93,750	0.25	\$31,250	\$125,000
2	Traffic Control	LS	\$25,000	0.75	\$18,750	0.25	\$6,250	\$25,000
3	Filter Fence & Temporary Erosion Control	LF	\$4	2,000	\$8,000	-	\$0	\$8,000
4	Tree Protection & Construction Limit Fencing	LF	\$2	4,000	\$8,000	-	\$0	\$8,000
5	Dewatering/ Creek By-Pass	LS	\$63,000	0.75	\$47,250	0.25	\$15,750	\$63,000
6	Clearing and Grubbing	LS	\$70,000	0.75	\$52,500	0.25	\$17,500	\$70,000
7	Restoration of Disturbed Areas	LS	\$70,000	1.00	\$70,000	-	\$0	\$70,000
8	Revegetation	LS	\$70,000	-	\$0	1.00	\$70,000	\$70,000
9	Revegetation Maintenance / Establishment	LS	\$140,000	-	\$0	1.00	\$140,000	\$140,000
10	Construction Access	EA	\$4,500	4.00	\$18,000	1.00	\$4,500	\$22,500
11	Fill Removal/ Excavated Floodplain	CY	\$62	1,630	\$101,037	-	\$0	\$101,037
12	Install Culvert	LF	\$150	50	\$7,500	-	\$0	\$7,500
13	Grade Control (Rock Check Dams)	EA	\$6,500	8.00	\$52,000	-	\$0	\$52,000
14	Stormwater Treatment Areas (Basins)	EA	\$20,000	2.00	\$40,000	1.00	\$20,000	\$60,000
15	Construct New Main Channel	LF	\$200	2,000	\$400,000	-	\$0	\$400,000
16	Channel Abandonment / Fill in Existing Channel	LF	\$80	-	\$0	1,800	\$144,000	\$144,000
17	Berm Removal	LF	\$60	250	\$15,000	-	\$0	\$15,000
18	Backfill Secondary Channel	LF	\$80	100	\$8,000	-	\$0	\$8,000
19	Improve Secondary Channel	LF	\$35	100	\$3,500	-	\$0	\$3,500
20	Watering / Activate New Channel	LS	\$25,000	-	\$0	1.00	\$25,000	\$25,000
21	Remove / Abandon Existing Culvert	EA	\$2,500	-	\$0	1.00	\$2,500	\$2,500
Construction Cost Estimate Sub Total					\$943,287		\$476,750	\$1,420,037
25% Contingency					\$235,822		\$119,188	\$355,009
Construction Cost Estimate					\$1,179,109		\$595,938	\$1,775,046

Federal Share EIP rationale (select and describe appropriate EIP criteria from 5 items below – projects must meet one or more of these 5 items):

1. Does the project involve federal land?
 → No
 ➤ If so, is the federal land involved important to successful implementation of the project?
2. Does the EIP identify the federal funding for the EIP project (project #)?
 → Yes. EIP numbers 327, 443, 878, 879, and 562 pertain to the Third Creek Watershed and each indicates a source of federal funding.
3. Does the project involve the conservation of a federal or regional threatened, rare, endangered or special interest species?
 → No
4. Does the project involve an identified federal interest such as the detection and eradication of noxious aquatic or terrestrial invasive species?
 → Yes, an inventory of plant species will be conducted and noxious invasives will be eliminated. For example, tall whitetop was present on a parcel adjacent to the Rosewood Creek Restoration-Area F implemented in the summer of 2008. Eradication treatment was conducted in conjunction with the restoration.

5. Does the project otherwise directly support federal implementation of capital projects in the EIP (e.g. technical assistance, data management, resource inventories, etc.)?
→ No

List Capital Focus Area(s) (as described in the 2006 Federal Vision):

Watershed and Habitat Improvement
Forest Health

Circle all that apply (must meet a minimum of one category):

1. Continued emphasis on forest ecosystem health/fuels reduction projects considering the LTBMU Stewardship Fireshed Assessment and Lake Tahoe Basin Multi-Jurisdictional Fuel Reduction and Wildfire Prevention Strategy.

2. Continued implementation of projects approved in Rounds 5 through 9 which implement the EIP. Project proposal should identify the applicable project(s) from Rounds 5 through 9 and clearly describe the phase/product being produced along with the consequence of not completing the project phase proposed for Round 10.

3. Project is consistent with and contributes toward TMDL pollutant reductions within the four source categories (atmospheric, urban & groundwater, forested uplands, and stream channel). List source category being addressed and integrate into the project nomination the following TMDL considerations (*see attached TMDL references – page 6). Source Category:

a) Describe whether, and how, the project demonstrates advanced, alternative, or innovative practices.

→ This project is innovative in terms of unique stream restoration/bed stabilization practices and represents the incremental continuation of Rosewood Creek restoration. Lower Rosewood Creek was reconstructed in 2004 and Area F of middle Rosewood Creek was restored in 2008. However, the most important and challenging restoration effort is the section of creek described for this project. This project demonstrates innovative program management practices because it is to be implemented on private land. Conditions in this highly degraded reach of Rosewood Creek are so severe that the three land owners do not have sufficient capital or resources to engineer, permit, and construct this restoration. An innovative partnership between County, Conservation District, TRPA, and land owners was successfully piloted upstream within Area F of Rosewood Creek in 2008. This proposed project will continue efforts to effectively integrate landowners and innovative technical design and construction to facilitate implementation within the tight urban SEZ corridor. The project will feature efficient and creative measures to achieve immediate and long term reductions in TMDL pollutants.

b) If project includes project level monitoring, describe ability of proposed monitoring strategy to contribute to the state of TMDL knowledge. Also describe if purpose of the capital project is to conduct data collection and/or analysis related to Lake Tahoe clarity.

➔ Project level monitoring is not included in this proposal as a funding request because the US Forest Service (Lake Tahoe Basin Management Unit (LTBMU)) and Nevada Division of State Lands (NDSL) are currently funding three sophisticated automatic water quality samplers along Rosewood Creek. One station is above the project area, one immediately below, and another 0.5 miles below. The monitoring was begun in 2004 to assess the incremental effects of restoration in various reaches (e.g., lower Rosewood, Area F). Continued monitoring will allow the project baseline and post-project performance to be examined relative to the estimates made for the TMDL.

c) Describe treatment approach for reducing pollutants, and/or measures to address connectivity between pollutant sources and Lake Tahoe or its tributaries. Identify target pollutants, and, to the degree feasible, provide quantitative estimates of project effectiveness at reducing pollutant loads (and/or a commitment to provide post-project estimates).

➔The anticipated approach involves constructing sections of new geomorphically functional channel, then deactivating and filling old incised channels. The construction activities will clear stands of dense even-aged willows and alders, restoring species, age, and structural diversity within the SEZ. The completed project will dramatically reduce bank and bed erosion. Geomorphic analyses (Mainstream 2005) estimate well over 2,000 yd³ have already been generated from this reach and another 10,000 yd³ has the potential to be eroded if the channel adjustments continue unchecked. The project area comprises a portion of the estimated stream channel load reduction for Third Creek made for TMDL (Lahontan and NDEP 2008). This system has been identified as having some of the most cost-effective stream channel load reduction opportunities. Since the project implement a full stream restoration approach in this reach, the benefits will include increased water quality 'treatment' of runoff in this urbanized watershed. It will reduce the stream bank source and not just stabilize the channel, but reconstruct a small functional active floodplain with sediment and nutrient net retention potential.

d) If appropriate, describe whether, and how, the project can be combined or coordinated with other TMDL implementation projects.

The project is one of the 'next' steps for implementing on the NV side of the basin within the Third Creek watershed, which has already had some initial restoration efforts in other reaches funded by the US Army Corps of Engineers.

4. Control of aquatic invasive species and prevention and/or detection of new aquatic invasive species.

Provide an overall Project Summary (maximum 200 words): (describe ONLY this Round 10 project):

Generate 100% design documents, complete permitting, construct a new channel, and fill in the old channel for Rosewood Creek from 100 feet above Northwood Blvd. to State Route 28 in Incline Village, Nevada. Restoration of this 2,200 foot reach will prevent an

additional 10,000 yd³ of stream bed and bank material from being eroded, mobilized, and transported to Lake Tahoe, will improve downstream water quality, and reduce the load of TMDL pollutants. The secondary objective is to enhance the functionality of the Stream Environment Zone and reduce downstream flood risk by reconnecting the stream with the floodplain. A tertiary focus will be the reduction of fuel load within the SEZ and the mitigation of catastrophic wildfire risk to Incline Village and US Forest land up-gradient. The project area comprises a portion of the estimated stream channel load reduction for Third Creek made for TMDL (Lahontan and NDEP 2008). This system has been identified as having some of the most cost-effective stream channel load reduction opportunities.

Please provide clear and concise written responses to each of the items below. Please state “not applicable” if you believe the item or question is not applicable to your project.

Is this project proposed as a multi-round project (previous or future)? (If yes, for previous or future projects describe in the Detailed Project Description below number of years or phases and which year the requested funding will cover).

➔ Yes. Project development began in 2004 with restoration of the lower reach and long term stream water quality monitoring. Subsequent development efforts include the 2005 Geomorphic and Riparian Assessment of the middle reach, preliminary design of the middle reach in 2006, completed design and construction of Area F of middle Rosewood Creek in 2007 and 2008, and the 90% design of Area A started in 2008.

It is anticipated the 90% design will be completed by summer 2009. The 100% design, final permits, construction specifications, and bid documents are to be funded by this grant and should be completed by May 2010. Construction of the new stream channel should commence by July 2010. Transfer of flows from the old channel to the new and fill of the old channel is scheduled for August 2011.

Although there are two phases of construction, Washoe County and regulatory agencies cannot risk a gap in funding halfway through the project. As a result, funding for the entire project must be assured before construction begins on phase 1 (building the new channel).

Detailed Project Description (focuses on what Round 10 is funding; list the number of years the requested funding will cover; briefly describe how this project links into previous and future projects).

➔ Rosewood Creek is a tributary of Third Creek, located in the Lake Tahoe Basin within Incline Village, Washoe County, Nevada (Figure 1). The Rosewood Creek watershed encompasses a total area of 1.15 square miles with the headwaters located at an elevation of approximately 8,500 feet in the Carson Range. The middle reach of Rosewood Creek extends from State Route (SR) 431 to SR 28 and ranges in elevation from 6,371 to 6,835 feet. The proposed Area A project site (Figure 1) is a 2,200 foot portion of the middle reach between SR 28 and 100 ft upstream of Northwood Blvd.

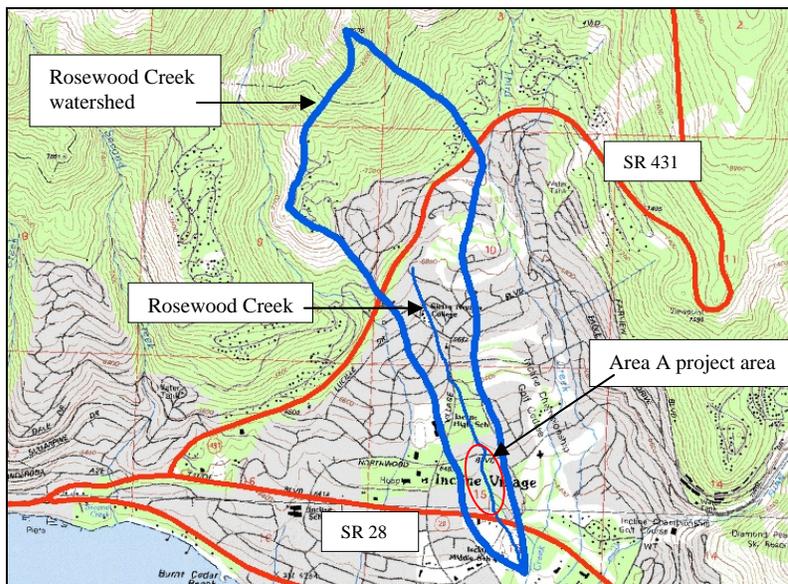


Figure 1. Rosewood Creek watershed and Area A project area in Incline Village, NV.

Incline Village, on the Nevada side of Lake Tahoe, experienced heavy development in the 1960s and 1970s that caused excessive sediment erosion to the Lake.¹ Since that time period, urban development has slowed and sediment erosion rates have subsequently decreased.² However, watersheds within Incline Village still have high rates of erosion and nutrient flux relative to background conditions where the Third Creek watershed (encompassing Rosewood Creek) is still rated as the fifth highest contributor of sediment load to the Lake.^{3,4} Research for the Lake Tahoe TMDL determined that the Third Creek watershed was the fifth highest contributor of fine sediment to Lake Tahoe (from perennial streams) and largest contributor on the Nevada side.⁵

Because of sediment and nutrient loading concerns, a completely new channel was constructed for Lower Rosewood Creek (between State Route 28 and Lakeshore Blvd.) in the summer of 2003. The objectives of the project were to reduce sediment and nutrient loading to the Lake and create a functioning SEZ.⁶ Initial results from monitoring efforts

¹ Glancy, P. 1988. Streamflow, sediment transport, and nutrient transport at Incline Village, Lake Tahoe, Nevada, 1970-73. US Geological Survey Water Supply Paper 2313. 53 p.

² Rowe, T., D. Saleh, S. Watkins, and C. Kratzer. 2002. Streamflow and water-quality data for selected watersheds in the Lake Tahoe Basin, California and Nevada, through September, 1998. US Geological Survey WRIR 02-4030. 116 p.

³ Simon, A., E. Langendoen, R. Bingner, R. Wells, A. Heins, N. Jokay, and I. Jaramillo. 2003. Draft Final Lake Tahoe Basin Framework Implementation Study: sediment loadings and channel erosion. USDA Agricultural Research Service, Channel and Watershed Processes Research Unit, National Sedimentation Laboratory, Oxford, Mississippi.

⁴ Simon, A. 2006. Estimates of fine-sediment loadings to Lake Tahoe from channel and watershed sources. USDA-ARS National Sedimentation Laboratory Research Report No.52. 59p.

⁵ Lahontan Regional Water Quality Control Board and Nevada Department of Environmental Protection 2007. Lake Tahoe Basin TMDL Technical Report.

⁶ Nevada Tahoe Conservation District. April 15, 2004. Nevada Division of State Lands Water Quality and Erosion Control Grants Program: Rosewood Creek Restoration Project Final Report, EIP #562 (Third Creek). 11p.

indicate the project may reduce sediment loading over time.⁷ However, there are indications of excessive sediment delivery from higher in the watershed and observations strongly suggest the source is from the middle reach.

A 2005 geomorphic and riparian assessment found Area A is unstable and actively degrading.⁸ Overall, Area A represents 24% of middle Rosewood Creek, but 75% of very unstable sections subject to extreme erosion in the future. In fact, if left unchecked, an additional 16,000 yd³ of soil and sub-soil material could be eroded from middle Rosewood Creek with the majority of it originating from Area A.⁸

In 2006, the Nevada Tahoe Conservation District led a team of consultants, land owners, regulatory agencies, and Washoe County engineers to design, permit, and construct a stream restoration project on 700 feet of middle Rosewood Creek between College Dr. and Village Blvd (known as “Area F”). Funded primarily with Bureau of Reclamation funds, with additional funding provided by Washoe County and the land owners, this project was the first publicly funded stream restoration project primarily on private residential property. Construction was completed in October 2008.

In September, 2008, Bureau of Reclamation established a \$465,000 grant with NTCD to complete the majority of engineering, design, and permitting required to restore Area A of Rosewood Creek. The grant, from non-SNPLMA appropriated funds, will generate 90% design documents, Environmental Assessment documents, and other local, regional, and federal permit documents. This funding does not provide for final permits, design documents, specifications, design reports, or construction. NTCD has letters of support from the affected land owners and is actively pursuing formal rights of entry, memorandums of understanding, and easements necessary to complete construction and long term monitoring and inspections.

Area A detailed description:

Beginning at SR 28 and working upstream, the first 400 ft of creek is incised over 10 ft and the width of incision is over 30 ft wide (Figure 2). The incision is nearly complete, in large part because of the culvert at SR 28 prevents further down cutting, but the stream banks continue to fail, widening the channel (Figures 3 through 6). It is estimated that 1,800 yd³ of material have been moved from this area to the lower reach of Rosewood Creek, to Third Creek, and into Lake Tahoe. The landowner of this reach recalls that during the 1970s and 1980s, a grass meadow existed in the current channel location and that in the 1960s he and his son fished in this stream (D. Craig Robinson, landowner, personal communication).

⁷ Susfalk, R. B. November, 2004. Effectiveness of the Rosewood Creek Restoration Project at reducing suspended sediment loading to Lake Tahoe: 2002 to 2004. Desert Research Institute Draft Publication for Agency Review. 40p.

⁸ Nevada Tahoe Conservation District. November 30, 2005. Middle Rosewood Creek Geomorphic and Riparian Vegetation Assessment. Prepared by Mainstream Restoration, Inc.

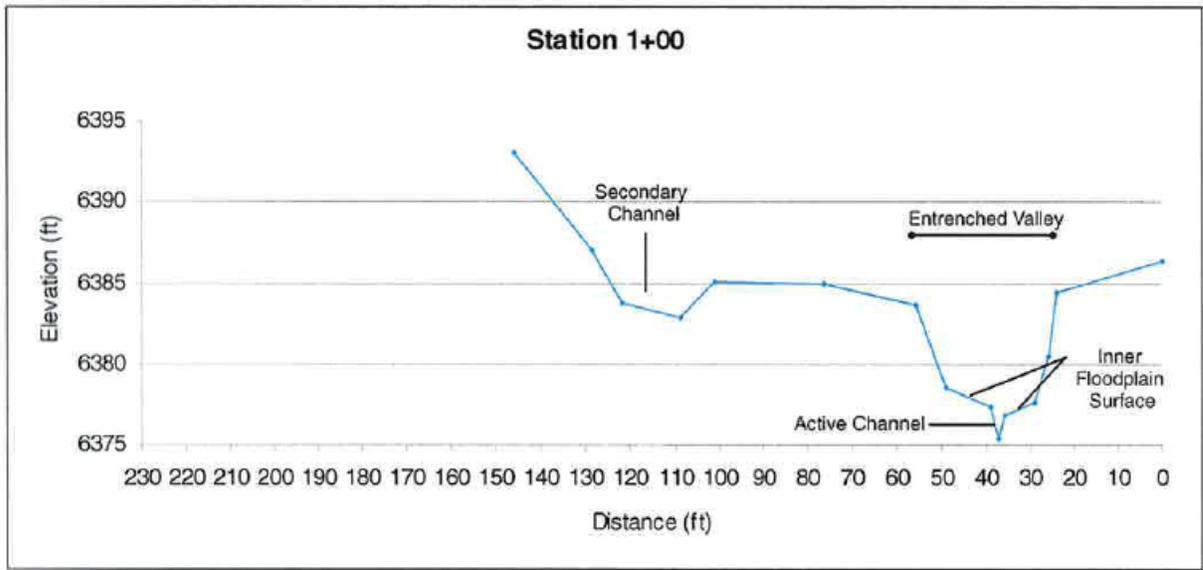


Figure 2. Profile of RWC above SR 28.



Figure 3. Bank failure near SR 28



Figure 4. Deep incision at lower section of Area A



Figure 5 and 6. Vertical bank at lower section of Area A.

The dramatic headcut is moving upstream. The next 200 ft of Rosewood Creek the channel is nearly 6 ft deep with vertical or undercut banks. The potential for additional incision and bank failure is very high. If this incision is allowed to progress it will affect a relatively stable upstream section of creek. The section of creek 600 ft to 880 ft from SR 28 represents an ideal stream configuration and a potential model for restoration of the entire Area A of Rosewood Creek. However, the next 900 ft to Northwood Blvd. “exhibits extreme, severe incision, generally reflecting the initial stages of rapid downcutting with vertical banks”⁸ (Figures 7 through 9). This section of the creek appears to have been relocated out of its original channel, west to a channel higher on the floodplain.

The 100 feet of stream above Northwood Blvd. would be realigned to a new culvert under Northwood Blvd. The new alignment would abandon a deeply incised stream section and move the stream to more stable location.

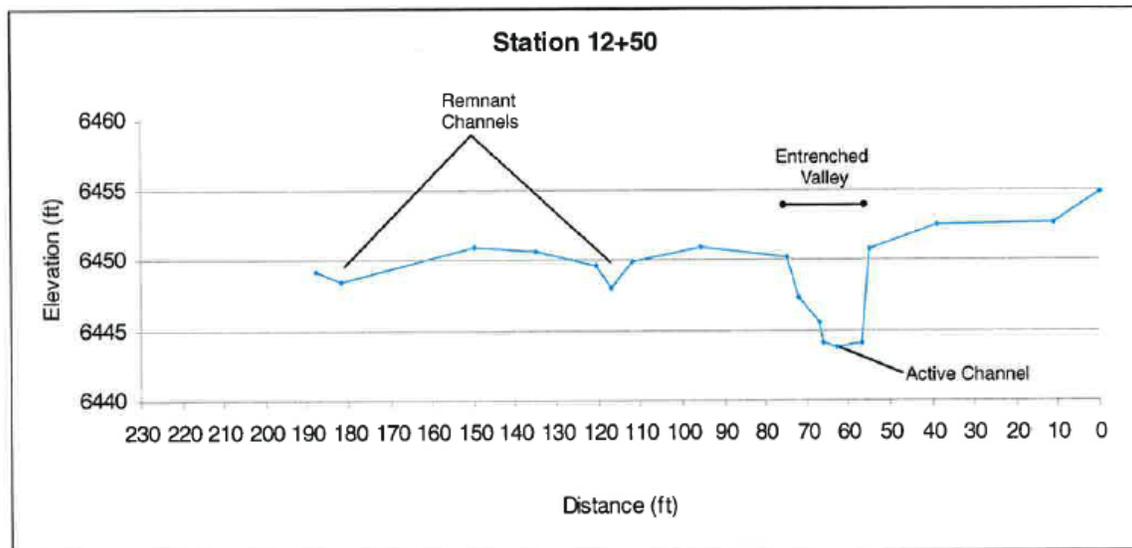
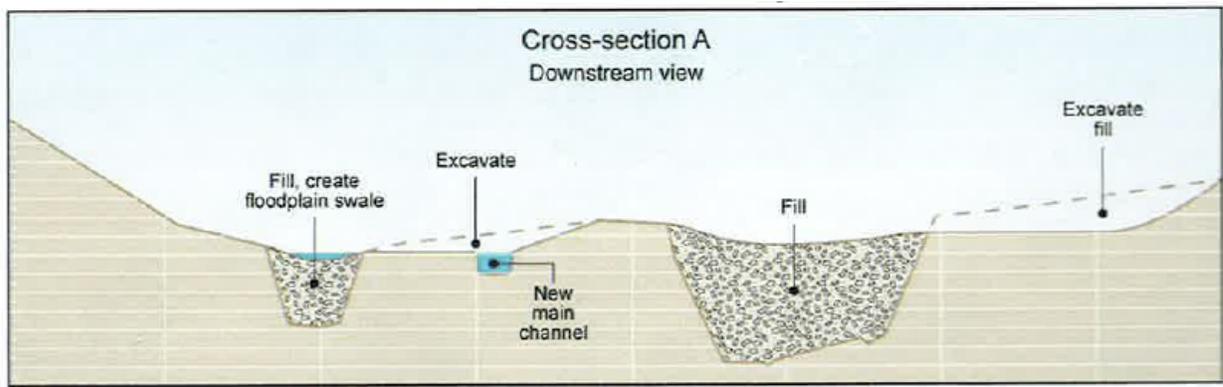


Figure 7. Stream profile near Northwood Blvd.



Figure 8 and 9. Incised channels near Northwood Blvd.

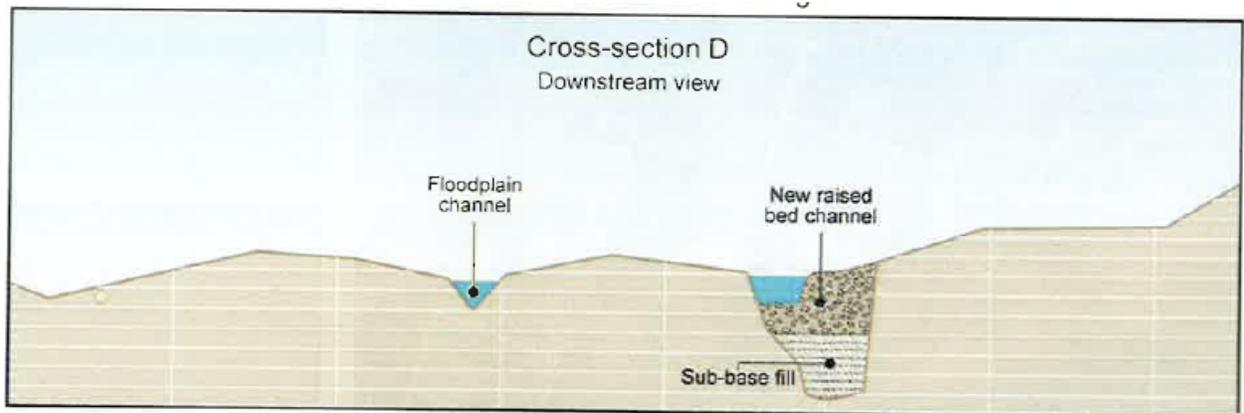
Following the 2005 geomorphic and riparian assessment, a team funded by the Bureau, led by NTC, and coordinated by Valley and Mountain Consulting, generated a 25% design for the restoration of middle Rosewood Creek (Figure 10). This effort divided middle Rosewood Creek into implementation areas, with the section of creek between 100 ft upstream of Northwood Blvd and SR 28 as Area A. For each implementation area, conceptual strategies for restoration were identified, along with opportunities and constraints. For example, the plan recommends filling the incised channel near SR 28 with adjacent material and to restore active channel back on the now-abandoned terrace surface to re-establish a functional floodplain (Figure 10). A rock cascade would be constructed to control the channel bed drop from the floodplain surface to the culvert inlet under SR 28. This approach allows for a more normal stream channel slope throughout the reach, while eliminating the need to adjust the elevation of the culvert under the highway.



Vertical exaggeration = 3:1

Figure 10. Profile of a restored section of Rosewood Creek (RWC) near SR 28 (25% Design, NTCD, 2006).

The remainder of the Area A would be similarly restored (Figure 11) with an emphasis of stopping headcuts, rewetting remnant channels, and reconnecting the channel with the surrounding floodplain. The goal would be to avoid the potential erosion and transmission of about 10,000 yd³ of sediment to Lake Tahoe over the next 50 years.⁹



Vertical exaggeration = 3:1

Figure 11. Profile of a restored section of RWC near Northwood Blvd (25% Design, NTCD, 2006).

The 25% design identified realignment of the culvert under Northwood Blvd to a location approximately 50 ft west of its current location and at a higher elevation to reconnect the channel with existing remnant channels on the terrace surface.

Restoration of Area A will dramatically improve habitat for aquatic species and improve fish passage within the reach.

Permits required: Area A would require TRPA “EIP” project approval, likely using an expanded checklist approach and de-watering plan. The US Army Corps of Engineers (USACE) would require a General Permit 16, Nevada Division of Environmental Protection (NDEP) would require a Temporary Working in Waterways Permit and Water Quality Planning (State 401 Water Quality Certification), and Washoe County would require Grading/Dust Control. Bureau of Reclamation will require compliance with the

⁹ Nevada Tahoe Conservation District. November 30, 2005. Middle Rosewood Creek Geomorphic and Riparian Vegetation Assessment. Prepared by Mainstream Restoration, Inc.

National Environmental Policy Act (NEPA). The NEPA Environmental Assessment (EA) prepared for Implementation of Area F provides a template, but a stand alone EA for Area A would be required. No USFS administered parcels are within or downstream of Area A, so no Special Use Permit (SUP) from the USFS is anticipated. Proposed improvements (culvert crossings, SWT facilities) within the Nevada Department of Transportation's (NDOT) or Washoe County public right-of-way (ROW) will require Encroachment Permits. In addition, rights of entry and easements from the local property owners will be required. Each property owner has signed a letter of support (attached) as an indication of their willingness to participate in the restoration process.

We are not aware of any threatened or endangered species in the project area.

Resources Available to Complete the Construction of Area A:

The 2005 Middle Rosewood Creek assessment funded by the Bureau of Reclamation and managed by NTCD cost approximately \$65,000.

In 2006 a preliminary design was funded by the Bureau and developed by NTCD for the entire 7,400 foot reach of Middle Rosewood Creek. Area A constitutes approximately 30% of this study and cost approximately \$110,000. From this preliminary design, specific project focus areas were delineated and detailed design was initiated for Area F, a 700 foot section of Rosewood Creek between College Dr. and Village Blvd. upstream from Area A.

In 2007/2008, the Bureau granted NTCD \$691,024 to generate the final permitted design and construct the restoration for Area F. Restoration of Area F was completed in October 2008. Many of the study and permit efforts for Area F encompassed the entire middle reach of Rosewood Creek and these resource are available to move the design and implementation of Area A forward from concept level.

In 2008, the Bureau established a \$465,000 grant with NTCD to generate the majority of design, environmental assessment, and permit documentation necessary to restore Rosewood Creek Area A. Several of the resources developed in previous steps and are being updated or expanded in the design development work now underway. These resources are:

- The *Delineation of Jurisdictional Resources* encompassed the entire Middle Reach, including Area A, was verified by the USACE in January 2007, and is valid for five years. The existing wetland delineation is valid for Area A impact assessment and to obtain a USACE General Permit 16.
- The Stream Environment Zone (SEZ) study encompassed the entire Middle Reach, including Area A, and was verified by the TRPA. This delineation is still valid for Area A impact analysis and TRPA permit application, and will be reviewed with TRPA staff during the 50-90 % design phase.
- The *Preliminary Geotechnical Investigation* (prepared by Wood Rodgers, Inc. in October 2006) included three bank profiles within Area A and identified five locations recommended for test pit analysis within that study area. The existing data would be

useful for developing the 50% design, but auger hole descriptions and soils sample analyses are being conducted to provide geotechnical information for the 90% design and to support the geology/hydrology report for TRPA.

- The vegetation, wildlife, and noxious weed assessments in 2007 covered the entire Middle Reach, including Area A, and included up-to-date information for the purposes of TRPA and NEPA evaluation. A site-specific tree survey and pre-construction noxious weed survey are being performed in Area A as part of the BOR funded design development.
- The cultural resources inventory in 2006 (Zeier and Associates) covered the entire Middle Reach, including Area A. Project specific impact analysis and Nevada State Historic Preservation Office (SHPO) concurrence would be addressed in the NEPA compliance document for BOR.
- The topographic cross sections surveyed in 2006 throughout the entire Middle Reach included 9 valley-spanning cross sections within the Area A section—these data are being supplemented by detailed field survey (Nov 2008) to updated the base map and hydraulic analyses as part of the BOR funded design development.
- The hydrologic analysis and dewatering plan prepared for Area F project will be updated and tailored for Area A. Continued hydrology and water quality monitoring along Rosewood Creek by NTCDD and the Desert Research Institute under NDSL and USFS funding will inform the design and permit documents.
- Hydraulic modeling for design and flood hazards will be needed, and since the plan is to move water out of the incised channel and back onto its floodplain, there may be a need to demonstrate compliance with FEMA standards.

Although updates or modifications will be needed to all the items below, there are several materials prepared for Area F that provide a suitable template and have shared background/overview information to help streamline the costs for Area A:

1. Bureau NEPA Environmental Assessment
2. TRPA Initial Checklist
3. NDEP, USACE and TRPA Permit Applications
4. Dewatering/BMP Plan
5. Standard Specifications

Table 2: General Schedule for Area A Implementation

Middle Rosewood Creek Geomorphic and Riparian Assessment	2005
Preliminary Design for Middle Rosewood Creek	2006
Final Design and construction of Area F, Rosewood Creek	2007/2008
90% design and initial permitting of Area A, Rosewood Creek	2009
Final design, permits, and specifications for Area A, Rosewood Creek	2010
Construct new channel in Area A	2010
Dewater, fill and revegetate old channel	2011

Describe the specific goals and objectives of the project and describe how fulfilling those objectives will contribute to the achievement of one more environmental thresholds (air quality, water quality, soil conservation, vegetation, fisheries, wildlife, scenic, noise, recreation).



1. Water quality:
 - Reduce total sediment and fine sediment load to lower reaches of Rosewood Creek and Lake Tahoe.
 - Improve the hydrologic connection between the stream and adjacent floodplain to allow some areas of net deposition within the reach. This change will promote a more healthy vegetation structure, reduce flood risk downstream, and prevent catastrophic stream bank failures.
2. Soil conservation:
 - Prevent the future loss of approximately 10,000 yd³ of soil from the project area and restore soil moisture regimes through improved floodplain processes and groundwater support.
3. Vegetation:
 - Reduce the fuel load and risk of catastrophic wildfire in the project area. This will be obtained through the direct effects of clearing and improving density and age classes and structure of the vegetation. And also a more functional floodplain will improve vegetation recruitment and change on the active floodplain.
4. Fisheries:
 - Improve stability of stream banks and bed in the project area to provide a stable habitat for aquatic life.
 - Construct and enhance pool/riffle, and step/pool physical habit within the project reach, that would be sustained by natural processes without the historic degree of sedimentation and debris jam degradation.
 - Improve resident fish movement by elimination of several large nickpoints and shallow, debris blockage areas, and potentially improve upstream and downstream fish passage at the Northwood culvert crossing, and permit access to habitat in adjacent stream reaches.
5. Wildlife habitat:
 - Improve the vegetation species, structure and age class distribution. Current large areas of even-age and same structure vegetation will be improved through selective removal and revegetation efforts. This will improve avian and mammal habitat, as well as reduce the risk of wildfire (as discussed above).

Describe the anticipated project accomplishments (i.e. products or identifiable environmental benefits being produced or implemented under this project):



- Decrease existing and future fine sediment load to Lake Tahoe and contribute to an improvement in lake clarity.
- Continue the successful private/ government partnership demonstrated along Rosewood Creek to-date.
- Reduce risk of wild fire moving through the urban SEZ.
- Improve aesthetics along the narrow creek corridor.
- Provide high visibility evidence of commitment to multi-objective SEZ restoration and sediment source reduction.

Describe the “readiness” of this project to move forward (urgency, capacity, capability, environmental documentation, interagency agreements, etc.):

➔ This project is currently funded through 90% design. The proposed team of project managers and engineers recently completed a similar restoration upstream at Area F of Rosewood Creek. The Area F effort successfully completed all environmental documentation and land owner agreements and will use the lessons learned from that experience to promote an efficient project at Area A.

There are a few aspects to the urgency and readiness for this project. First, Area A is actively degrading and the potential for dramatic sediment delivery during a large runoff event is extreme. Second, the relationships between the design team, project managers, and land owners are established. These relationships of trust and experience can help provide cost-effective and schedule-efficiencies through project completion. Finally, the background technical studies, prior environmental documents, and customized permit package materials developed for the overall Rosewood Creek system or Area F, are still appropriate to work from with minor updates, and represent a significant cost savings compared to starting from scratch.

Describe partnerships for this project. (if applicable, project should identify committed/secured partner funding and/or other partner contributions (describe) and how it is integrated into the project):

➔ **Partnerships:**

- Bureau of Reclamation will sponsor this activity and help generate/review the NEPA Environmental Assessment.
- Washoe County Public Works will act as official project proponent during the permitting, bidding, and construction contracting phase.
- Nevada Tahoe Conservation District acts as overall program and project manager to guide the design, coordination, permitting, funding, and construction. NTCD directly interfaces with land owners and establishes access agreements to private land.
- Land owners provide design input, access, and other logistical support as negotiated with NTCD. There is potential for direct fiscal support for this project by the land owners, but it would be minor compared to the over project cost.
- Consultants: Valley and Mountain Consulting manages a team of engineers, environmental planners, revegetation specialists, and geomorphologists.

Describe the estimated environmental risks from unintended consequences of the proposed project:

➔ The primary environmental risk involves short term risk of high flows through the project area during or immediately after active construction. Premature high flows could cause significant erosion. To mitigate that risk, the project proposes to construct and season the new channel segments one year before full flow is introduced, and proposes specific construction timing restrictions, dewatering approaches, and temporary BMPs for work in the active channel.

Describe the project monitoring that will be implemented as part of this project including:

➔ Long term water quality monitoring is not proposed to be funded by this project. However, long term water quality monitoring is active above and below the project area

and is currently funded by Nevada Division of State Lands (NDSL) and US Forest Service, Lake Tahoe Basin Management Unity (USFS LTBMU).

Other long term monitoring will likely be required by TRPA related to success of the revegetation in the project area for a period of five years. This project will provide funds for revegetation monitoring, but will be a relatively insignificant sum.

1) The questions the monitoring program is designed to answer.

➔ The water quality monitoring began in 2004 and is continuing with three automatic water quality samplers along the length of Rosewood Creek jointly managed by NTCO and the Desert Research Institute. The objective is to assess the collective and incremental benefits of stream restorations on Rosewood Creek in terms of TMDL pollutants of concern. Continued NDSL and LTBMU grant funds are anticipated for the duration of this project.

2) Describe the methods and strategies (i.e. monitoring, research, or both) that will be used to verify whether the project goals and objectives have been met? (Note, a detailed monitoring plan and/or research plan is not required, however, enough detail must be provided to allow someone that is unfamiliar with the project to understand and evaluate the proposed methods and strategies)

➔ Water quality monitoring will assess the long term reduction in fine sediment load to Third Creek and Lake Tahoe.

Revegetation monitoring would involve photo and video documentation regarding the success of the stream bank and floodplain revegetation. Some statistical-based methods to assess percent coverage will likely be employed.

3) Describe whether the monitoring or research associated with this project fits into or is part of a larger monitoring or research program

➔ Revegetation monitoring will satisfy regulatory requirements only. However, the water quality monitoring will likely be incorporated into basin-wide water quality assessment efforts.

4) Describe how information from the monitoring and/or research will be used to improve the continued performance of the proposed project or future similar projects

➔ Revegetation monitoring will directly educate the methods and material used in future efforts. Water quality monitoring can help support justification for continued stream restoration projects.

Describe how the project results will be communicated and made available to the public.

➔ Preproject communication is primarily through the permitting process and generally involves organizations and individuals directly associated with granting permission for the construction (although the Environmental Assessment is available for public comment). A project summary will be submitted to the local paper for publishing. Posters and presentations will be made to area environmental conferences.



Figure 12. 25% design plans showing Area A of middle Rosewood Creek

*** TMDL References**
**Contributions of Project to Lake Tahoe Sediment and Nutrient Total Maximum
Daily Load (TMDL)**

Project nominations that fit the category of being consistent with and contributing to TMDL pollutant load reductions should provide additional rationale under items 3a – 3d of Appendix K. Supporting documentation to assist in providing responses to these items may be found at:

1. Lake Tahoe TMDL Pollutant Reduction Opportunity Report

(http://www.swrcb.ca.gov/rwqcb6/water_issues/programs/tmdl/lake_tahoe/docs/presentations/pro_report_v2.pdf), and

2. Integrated Water Quality Management Strategy Project Report

(http://www.swrcb.ca.gov/rwqcb6/water_issues/programs/tmdl/lake_tahoe/docs/iwqms_proj_report.pdf).

[These reports may also be accessed at Nevada Division of Environmental Protection's website, <http://ndep.nv.gov/bwqp/tahoe.htm>]