

Sound Watershed Consulting

Creating Functional Water Environments



Project Status Update


October 15, 2009



A Few Project Benefits

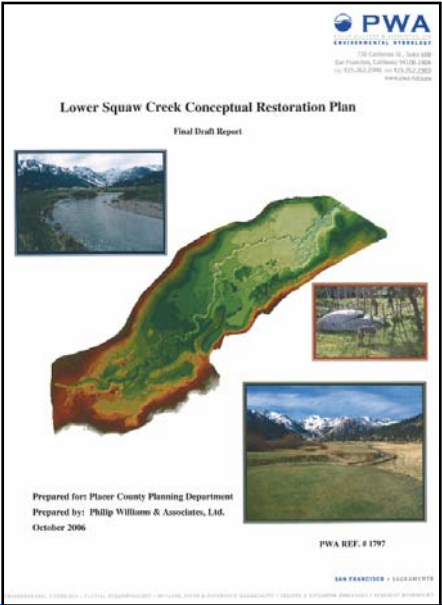
- Provide Regulatory Relief
- Reduce Costs to Landowners
- Improve Ecosystem Function
- Trap Fine Sediment
- Resolve TMDL Issues
- Regulate Bedload Effects on Channel Morphology
- Limit Bank Erosion
- Reverse Channel Incision
- Regulate Avulsion Potential
- Locally Improve Channel Stability
- Manage Flood Risk
- Improve Water Quality
- Raise Local Water Table (Floodplain Storage)
- Provide Surface Water Storage for Dry Season Release
- Resist Conifer Encroachment on Floodplain
- Reconnect Floodplain Channels
- Maintain Access and Egress to Floodplain Channels
- Restore/Improve Floodplain Wetlands
- Address Turf Grass Invasion
- Establish Cottonwood Gallery Forest
- Increase Shade for Nutrient Management
- Establish Native Riparian Vegetation Community
- Maintain Pool Quality/Density
- Improve/Maintain Cover Habitat]
- Improve Overall Aesthetics
- Maintain Spawning Gravel Availability

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Initial Project Study Report

- Developed Initial Studies
- Evaluated Project Opportunities & Constraints
- Identified 4 Basic Conceptual Alternatives



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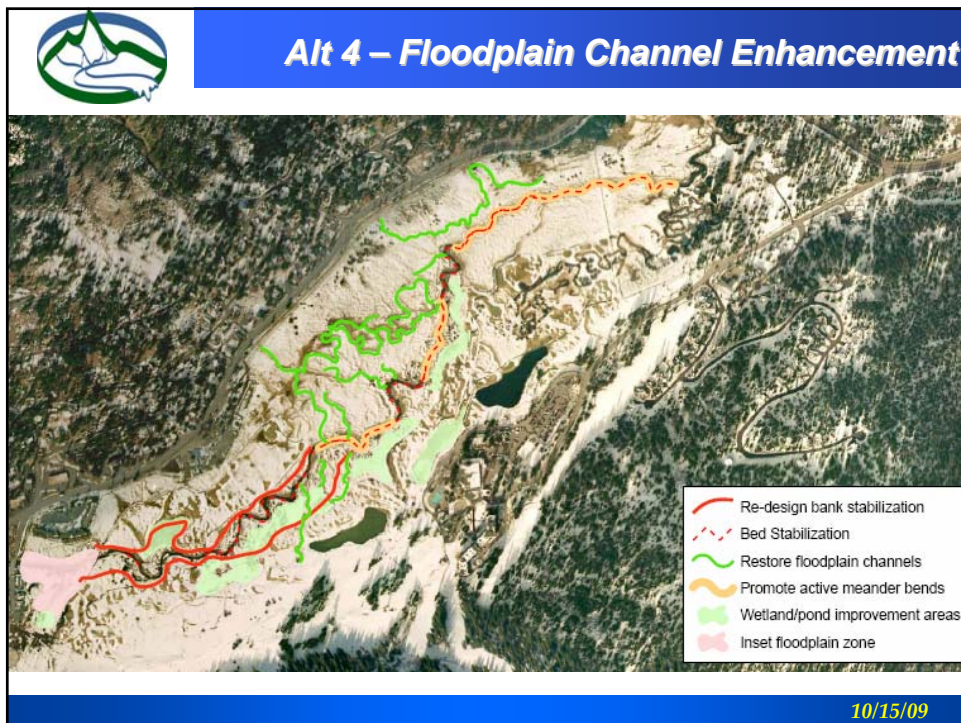
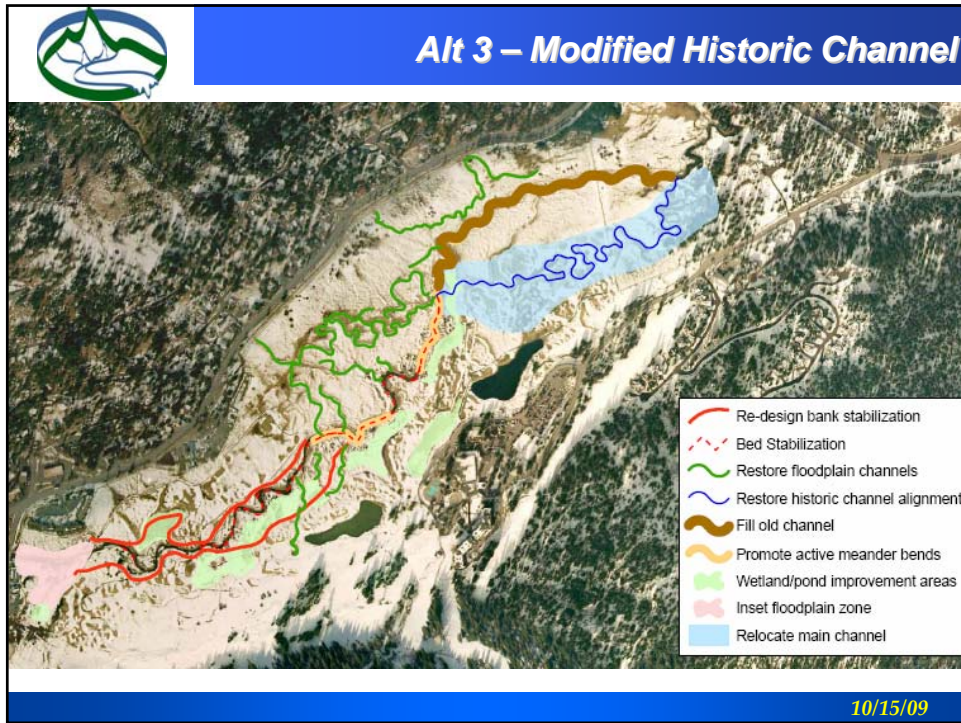


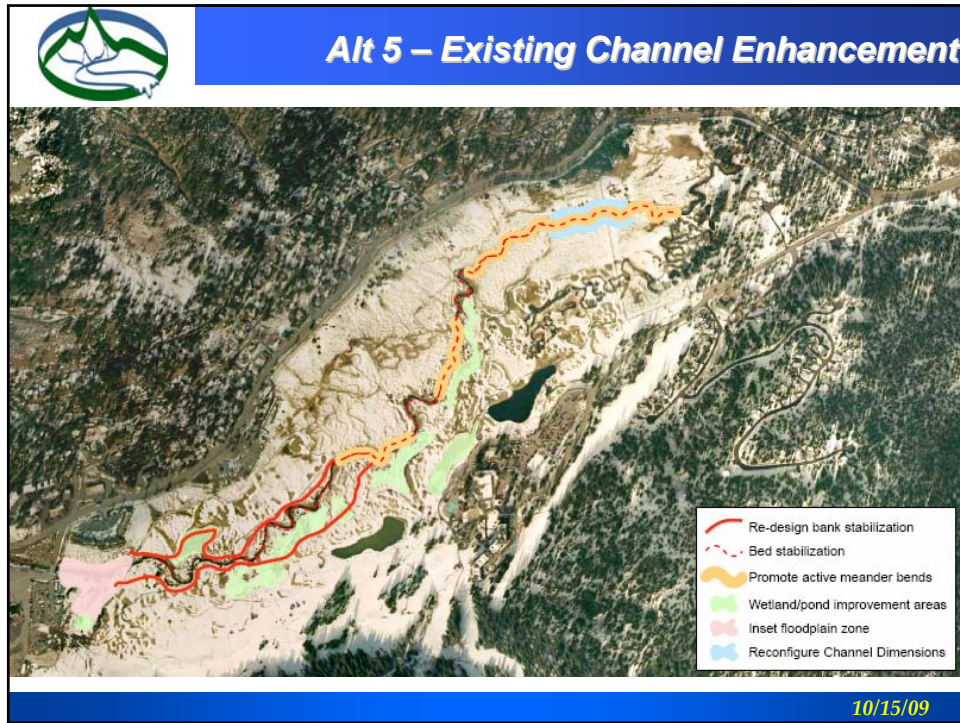
Alt 2 – Restored Pre-European Channel



- Restore historic channel system
- Fill old channel
- Re-design bank stabilization
- - - Bed Stabilization
- Wetland/pond improvement areas
- Inset floodplain zone
- Relocate main channel

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Project Reports & Updates


- Lower Squaw Creek Restoration Floodplain Technical Workshop Report (September 19, 2008)
- Lower Squaw Creek Restoration Preliminary Phase 2.2 PRELIMINARY DRAFT Scope of Work v1.2 (May 19, 2009)
- Lower Squaw Creek Restoration Public Workshop (May 15, 2008)
- Lower Squaw Creek Restoration Technical Workshop Report (January 16, 2009)
- Creek Restoration Project REVISED DRAFT Working Project Master Plan and Scope of Work Version 1.1 (October 6, 2009)

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Public Workshop

- Broad support for Alternative 2
- Concerns about the Trapezoidal Channel
- Desire for increased public access
- Upland Storage Ideas



**Lower Squaw Creek Restoration
Public Workshop**

for
**The Friends of Squaw Creek
Truckee River Watershed Council
Sierra Nevada Conservancy**

Prepared by:
Mike Liguori


May 15, 2008

Funding for this project has been provided by the Sierra Nevada Conservancy, an agency of the State of California.

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Floodplain Workshop

Conclusions

- Unlikely to restore historical hydrology
- Floodplain connectivity important
- SVPSD study will provide more info
- Channel likely drives floodplain issues
- No single source of water available



**Lower Squaw Creek Restoration
Floodplain Technical Workshop Report**

for
**The Friends of Squaw Creek
Truckee River Watershed Council**

Prepared by:
Mike Liguori
Chris Boules

September 19, 2008

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Floodplain Workshop


Conclusions

- Unlikely to restore historical hydrology
- Floodplain connectivity important
- SVPSD study will provide more info
- Channel likely drives floodplain issues
- No single source of water available

Recommendations

- Expand Project Footprint
- Identify Additional Off-Channel Storage
- Feasibility Evaluations
- Floodplain Characterization Study
- Floodplain Water Budget
- Piezometer Transects

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Alternative Sources of Storage

- Identified several potential sources
 - Provides less than $\frac{1}{2}$ of pre-European storage

Site	Length (ft)	Avg Width (ft)	Depth (ft)	Volume (ft ³)	Volume (ac-ft)	Avg discharge for 120 days (cfs)
North Bank Wetland (upper)	269	120	1.0	32,280	0.74	0.003
North Bank Wetland (lower)	350	150	1.0	52,500	1.21	0.005
Olympic Channel Wetland	700	100	1.0	70,000	1.61	0.007
Searchlight Pond	158	100		267,458	6.14	0.026
Trapezoidal Channel	2100	60	12	1,512,000	34.71	0.146
Confluence Delta	360	200	10	720,000	16.53	0.069
Combined Lower North Fork	1270	85	7.1	766,445	17.60	0.074
Total				3,420,683	78.53	0.330

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Creek Workshop

Unanimous Consensus

- Diagnoses are correct
- Right Approach
- Expand Footprint to include Trapezoidal Channel
- Proceed with Design
- Develop Alt 2 PLUS refinements

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**Lower Squaw Creek Restoration
Creek Technical Workshop Report**

for
*The Friends of Squaw Creek
Truckee River Watershed Council*

Prepared by:
Mike Liawori
Chris Bowles (cbec)

January 16, 2009

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Creek Workshop


Unanimous Consensus

- Diagnosis is correct
- Right Approach
- Expand Footprint to include Trapezoidal Channel
- Proceed with Design
- Alt 2 PLUS

Recommendations

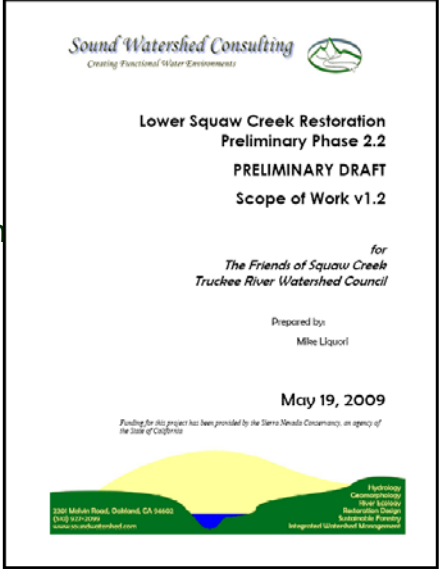
- Bedload Issues
- Hydro & Hydraulics
- Detailed Stream Alignment Map
- Cases Studies & Literature Review
- Implement in phases with Adaptive Management

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Draft Scope of Work

- Conceptual streamflow improvement alternatives
- Conceptual refinements & preliminary restoration design
- Recommended Analytical Tasks



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Lower Squaw Creek Restoration
Preliminary Phase 2.2
PRELIMINARY DRAFT
Scope of Work v1.2

for
The Friends of Squaw Creeks
Truckee River Watershed Council

Prepared by
Mike Ligori


May 19, 2009

Funding for this project has been provided by the Sierra Nevada Conservancy, an agency of the State of California.

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Restoration Design
Accountable Priority
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Draft Scope of Work

- Conceptual streamflow improvement alternatives
- Conceptual refinements & preliminary restoration design
- Recommended Analytical Tasks
- **Tentative support for Alt 2 PLUS**
- **Preference for more *on-the-ground* actions**

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Overall Project Approach

Refine Plan on Parallel Pathway

- Subject to available funding

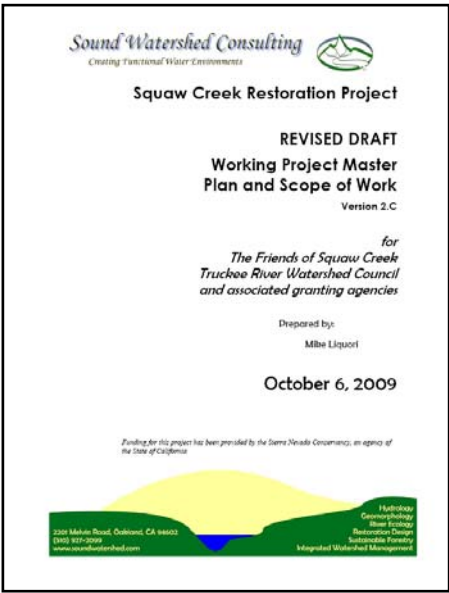
1. Continue to Develop a Comprehensive & Integrated Project (Master Plan)
 - ID Project Elements & Costs
 - Basic Conceptual Design Improvements
 - Additional Technical Analysis
 - feasibility & design studies
 - Select Preliminary Design Elements
2. Identify Smaller Phased Projects
 - For faster implementation

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Working Draft Master Plan

- Compiles scope elements into a single document
- Outlines status of preferred alternative concept
- Seeks to develop common agreement on scope for ~\$50K in available funding



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Squaw Creek Restoration Project

REVISED DRAFT
Working Project Master
Plan and Scope of Work
Version 2.C

for
The Friends of Squaw Creek
Truckee River Watershed Council
and associated granting agencies

Prepared by:
 Mike Liquori


October 6, 2009

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Current Conceptual Design Components


- Detention Storage Areas
- Bedload Management Zone
- Inset Floodplain
- Wetland/Pond Improvement Areas
- Olympic Channel Improvements
- Searchlight Pond Conveyance Improvements
- Bank Stabilization
- Setback Floodway Controls
- Restore Floodplain Channels
- Restore Historic Channel Alignment
- Grade Control Structures
- Constructed Swale
- Various Habitat Enhancements

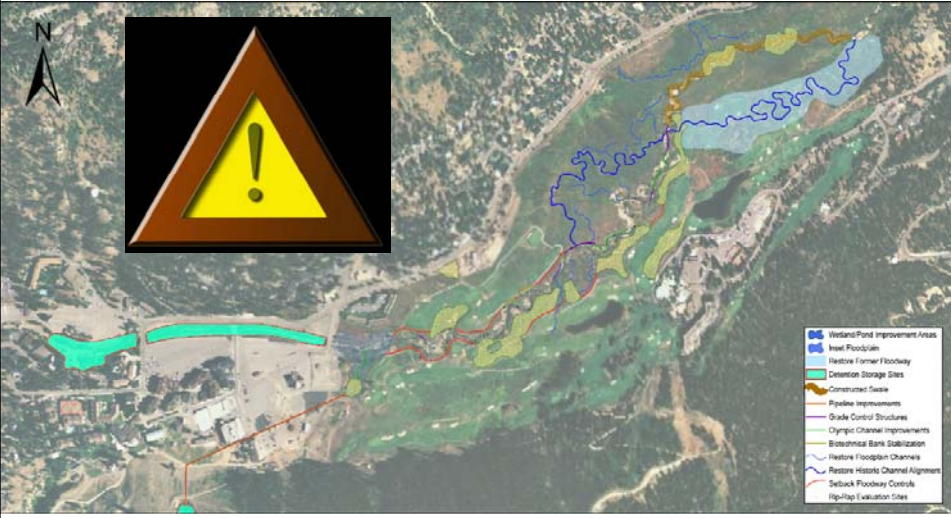


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Working Map





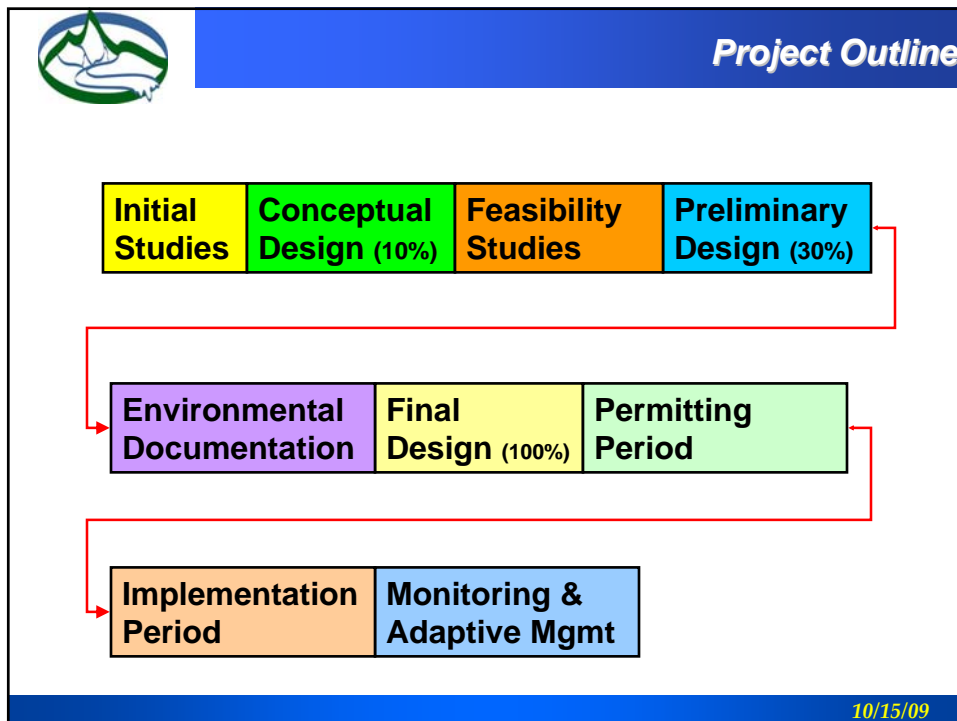
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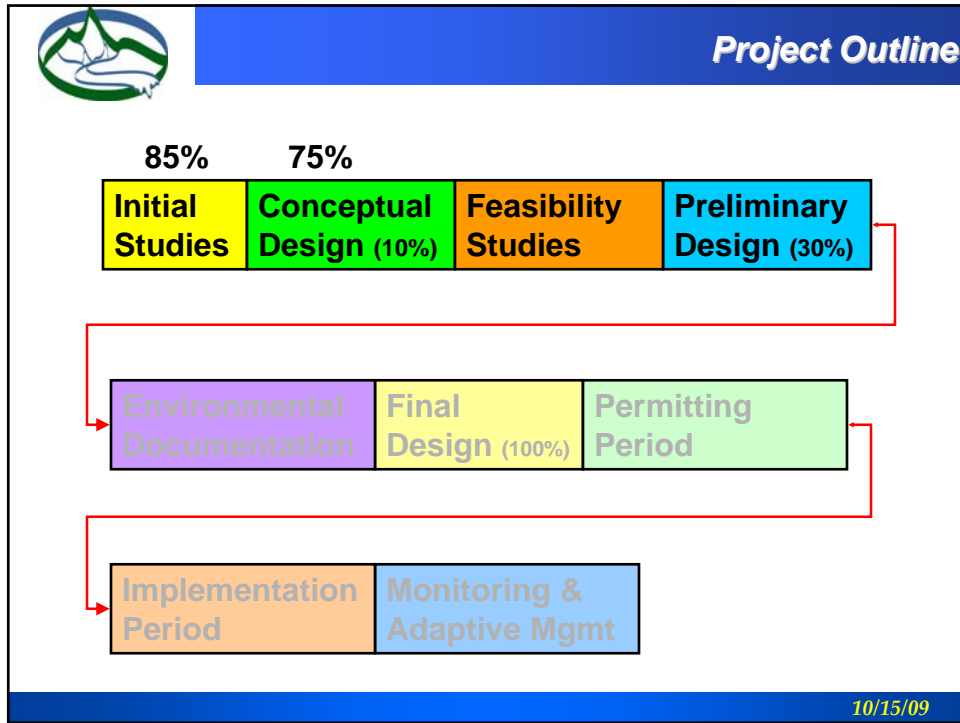
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Scope of Work Discussion

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Recommended Scope Priorities

#	Proposed Tasks	Budget	Sub-Total
	Remaining Available	\$ 43,520	
	Remaining Authorized	\$ 56,507	
Recommended Tasks			
1	Coordinate with Key Stakeholders	\$ 9,080	
2	Review Existing Studies	\$ 1,440	
3	Streamflow Monitoring Stations	\$ 16,000	
4	Water Detention Storage Feasibility	\$ 7,710	
	Sub-Total		\$34,230
Contingent Tasks			
5	Select Bank Stabilization Design	\$ 16,400	
6	Searchlight Pond	\$ 7,700	
7	Reach 6A Improvement Alternatives	\$ 9,600	
	Sub-Total		\$33,700
Other Priority Tasks			
8	Case Studies of Similar Projects	\$ 6,000	
9	Bank Stabilization Priorities	\$ 7,800	
	Sub-Total		\$13,800
	Total		\$ 81,730

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 **Bank Stabilization Design**

- Restoration Components
 - Biotechnical Bank Stabilization Design
 - Instream flow diversion structures??
 - Preliminary design suitable for permitting & construction in 2010




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 **Searchlight Pond**

- Investigate Alternatives for:
 - Connecting searchlight pond to Reach 6A
 - Improving Pond Outlet
 - Potential Feasibility
 - Operational
 - Water Rights
 - etc

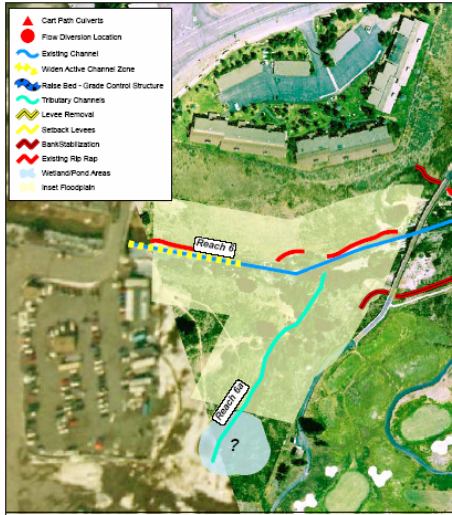


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Reach 6A - Potential Components

- Preliminary Design for
 - Tributary Improvements
 - Inset Floodplain (partial)
 - Bank Stabilization



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Current Funding

• Placer County	\$18,500
• Lahontan RWQCB	\$20,000
• Sierra Nevada Conservancy	
– Currently Available	\$ 0
– Pending Authorization	\$12,987
• Squaw Valley PSD	
– Monitoring Equipment	\$1.

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Other Potential Tasks

- Case Studies of Similar Projects
 - Merrill-Davies and/or other Plug & Pond sites

- Bank Stabilization Priorities
 - Detailed survey & classification of failing bank locations

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Urgency

Timely Decisions on Scope are Critical for Several Tasks

- Stream Monitoring
- Design Fieldwork

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Future Budget Projections

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Potential Funding Sources

- Lahontan RWQCB
 - Remaining Red-Dog Monies \$50,000
- Sierra Nevada Conservancy
 - Funds to cover CEQA ~\$500,000ish
- National Fish & Wildlife Foundation
 - Keystone Project Matching grant \$??
- Other Short-Term Potential Sources
 - North American Wetlands Conservation Act
 - Drinking Water Program Section 75025 Funding

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Conceptual Refinements & Prelim Design

- **Expand The Project Footprint \$5-15k**
- **Preliminary Designs to Mitigate for the Hydraulic and Bedload Transport Effects of the Trapezoidal Channel \$20-50k**
- **Preferred Channel Alignment For Restoring Relict Secondary Channels \$12-20k**
- **Conceptual Designs for Integrating Late-Season Flows from Surface Detention Facilities \$??**
- **Identify Wetland & Pond Restoration Priorities \$8-20k**

Total	\$75,000-115,000+
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Additional Technical Analysis

- **Extended Project Area Topographic Survey \$4-15k**
- **Hydrologic Analysis \$8-15k**
- **Flow Routing Model and Water Budget \$3-10k**
- **Basic Hydraulic Modeling \$25-40k**
- **Detailed 2D Hydrodynamic Modeling \$35-80k**
- **Preliminary Sediment Supply Evaluation \$10-30k**
- **Bedload Transport Study \$40-75k**
- **Identify Optimal Flow Levels \$16-20k**
- **Updated stream cross-sections ~\$15k**
- **Floodplain Characterization Study \$12-20k**
- **Revise Conceptual Drawings & Maps (variable)**
- **Project Management & Reporting (~\$10-15k/year)**

Total	\$178,000-335,000
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Other Future Tasks

- **Permitting Tasks**
 - Botanical & Biological Surveys \$30-60k
 - Permitting Strategy \$10-15k
 - Environmental Documents & Permitting \$225-\$600k

- **Detailed Design & Construction Opps**
 - Phased Implementation Plan \$15-20k
 - Detailed Design & Specifications \$200-400k

Total \$480,000-1,100,000

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Cost Projection

Current Priorities	\$82,000
Conceptual Refinements	\$75,000-115,000
Additional Technical Tasks	\$178,000-335,000
Permitting & Detailed Design	\$480,000-1,100,000
Total Design & Permitting	
	\$815,000 to \$1,632,000

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