

TABLE 1
ALTERNATIVES 1 AND 2 ECOSYSTEM RESTORATION - REACH 1
LOW RESTORATION EMPHASIS

Code	Description	Unit	Quantity	Unit Cost	Total Cost
1	Lands and Damages				
a.	Land Acquisition	Acres	25	\$ 5,000	\$ 125,000
				Subtotal	\$ 125,000
				Contingency and Unlisted Items (20%)	\$ 25,000
				Subtotal for Lands and Damages	\$ 150,000
6	Fish and Wildlife Facilities				
	High: Stream Banks				
	High: Riparian Vegetation				
	High: Exotic Vegetation Control				
	High: Geomorphic Restoration				
	Medium: Stream Banks				
	Medium: Riparian Vegetation				
	Medium: Exotic Vegetation Control				
	Medium: Geomorphic Restoration				
	Low: Stream Banks	Linear Feet	5305	\$ 10	\$ 53,050
	Low: Riparian Vegetation	Acres	9.3	\$ 600	\$ 5,580
	Low: Exotic Vegetation Control	Acres	9.3	\$ 1,000	\$ 9,300
	Low: Geomorphic Restoration				
				Subtotal	\$ 67,930
				Contingency and Unlisted Items (20%)	\$ 13,586
				Subtotal for Fish and Wildlife Facilities	\$ 81,516
SUBTOTAL					
30	Planning Engineering and Design	Lump Sum	1	\$ 9,782	\$ 9,782
31	Construction Management	Lump Sum	1	\$ 6,521	\$ 6,521
TOTAL FIRST COST					\$ 247,819

**TABLE 19
QUANTITIES AND COST ESTIMATES FOR STREAM BANKS**

<i>Reach 1: Totally Remove Riprap and Replace with Bioengineered Structures (All Alternatives, High Resolution Emphasis)</i>				
Description	Unit	Quantity	Unit Cost	Total Cost
Partial Riprap Removal (minimum mobilization)	LS	1	\$ 1,150	\$ 1,150
Bioengineered Structures	LF	481	\$ 50	\$ 24,050
			Total	\$ 25,200

<i>Reach 1: Partly Remove Riprap and Replant with Willows and Cottonwood (All Alternatives, Medium Restoration Emphasis)</i>				
Description	Unit	Quantity	Unit Cost	Total Cost
Partial Riprap Removal (minimum mobilization)	LS	1	\$ 1,150	\$ 1,150
Plant with Willow and Cottonwood	LF	481	\$ 13	\$ 6,253
			Total	\$ 7,403

<i>Reach 2: Totally Remove Riprap and Replace with Bioengineered Structures (All Alternatives, High Restoration Emphasis)</i>				
Description	Unit	Quantity	Unit Cost	Total Cost
Partial Riprap Removal (minimum mobilization)	LS	1	\$ 1,150	\$ 1,150
Bioengineered Structures	LF	100	\$ 50	\$ 5,000
			Total	\$ 6,150

<i>Reach 2: Partially Remove Riprap in Barren Locations and Replant with Willows and Cottonwood (All Alternatives, Medium Restoration Emphasis)</i>				
Description	Unit	Quantity	Unit Cost	Total Cost
Partial Riprap Removal (minimum mobilization)	LS	1	\$ 1,150	\$ 1,150
Plant with Willow and Cottonwood	LF	100	\$ 13	\$ 1,300
			Total	\$ 2,450

<i>Reach 2: Manage for Natural Regeneration on Partly Vegetated and Barren Banks on North Side of River. Apply Erosion Control Measures to Newly Created Benches on South Side of River (Alternative 3, Low Restoration Emphasis)</i>				
Description	Unit	Quantity	Unit Cost	Total Cost
Manage for Natural Regeneration	LF	2,802	\$ 13	\$ 36,426
Hydroseed South Bank Benches	AC	0.8	\$ 2,500	\$ 2,000
			Total	\$ 38,426

<i>Reaches 3 and 4: Use Bioengineered Structures to Stabilize and Vegetate Barren Banks (Alternatives 1 and 2, High Restoration Emphasis)</i>				
Description	Unit	Quantity	Unit Cost	Total Cost
Partial Riprap Removal (minimum mobilization)	LS	1	\$ 1,150	\$ 1,150
Bioengineered Structures	LF	2,645	\$ 50	\$ 132,250
			Total	\$ 133,400

TABLE 19 (continued)
QUANTITIES AND COST ESTIMATES FOR STREAM BANKS

<i>Reaches 3 and 4: Remove Riprap and Replant with Willows and Cottonwoods (Alternatives 1 and 2, Medium Restoration Emphasis)</i>				
Description	Unit	Quantity	Unit Cost	Total Cost
Partial Riprap Removal (minimum mobilization)	LS	1	\$ 1,150	\$ 1,150
Plant with Willow and Cottonwood	LF	91	\$ 13	\$ 1,183
			Total	\$ 2,333

<i>Reaches 3 and 4: Manage for Natural Regeneration on Partly Vegetated and Barren Banks on North Side of River. Apply Erosion Control Measures to Newly Created Benches on South Side of River (Alternative 3, Low Restoration Emphasis)</i>				
Description	Unit	Quantity	Unit Cost	Total Cost
Manage for Natural Regeneration	LF	6,418	\$ 13	\$ 83,434
Hydroseed South Bank Benches	AC	1.7	\$ 2,500	\$ 4,250
			Total	\$ 87,684

TABLE 20
QUANTITIES AND COST ESTIMATES FOR RIPARIAN VEGETA

Reach 2: Retain all Existing Riparian Vegetation on the North Side of River. Hydroseed and Manage South Side of River (Alternative 3, Low Restoration Emphasis)

Description	Unit	Quantity	Unit Cost
Retain and Protect Existing Riparian Vegetation	AC	4	\$ 600
Hydroseeding on Benches	AC	62.2	\$ 2,500
Manage Natural Regeneration on Benches	AC	62.2	\$ 600
Total			

Reach 2: Interplant and Expand Existing Riparian Forest on North Side of River. Create New Riparian South Side of River Along Pioneer Ditch (Alternative 3, Medium Restoration Emphasis)

Description	Unit	Quantity	Unit Cost
Interplant and Expand Existing Forest	AC	3.1	\$ 8,840
Create New Riparian Forest	AC	11.2	\$ 8,840
Plant Benches on South Side of River	AC	62.2	\$ 8,840
Total			

Reaches 3 and 4: Interplant and Expand Forest on North Side of River. Plant Benches on South Side of River (Alternative 3, Medium Restoration Emphasis)

Description	Unit	Quantity	Unit Cost
Interplant and Expand Existing Forest	AC	17.1	\$ 8,840
Plant Benches on South Side of River	AC	146.2	\$ 8,840
Total			

Reaches 3 and 4: Retain all Existing Riparian Vegetation on North Side of River. Hydroseed and Manage Natural Revegetation on South Side of River (Alternative 3, Low Restoration Emphasis)

Description	Unit	Quantity	Unit Cost
Retain and Protect Existing Riparian Vegetation	AC	17.2	\$ 600
Hydroseeding on Benches	AC	146.2	\$ 2,500
Manage Natural Regeneration on Benches	AC	146.2	\$ 600
Total			

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<i>ge Benches on the</i>	
Total Cost	
\$	2,400
\$	155,500
\$	37,320
\$	195,220

<i>rian Habitat on</i>	
Total Cost	
\$	27,404
\$	99,008
\$	549,848
\$	676,260

<i>le of River</i>	
Total Cost	
\$	151,164
\$	1,292,408
\$	1,443,572

<i>image Benches for</i>	
Total Cost	
\$	10,320
\$	365,500
\$	87,720
\$	463,540

TABLE 21
QUANTITIES AND COST ESTIMATES FOR GEOMORPHIC RESTO

Reach 1: Riparian Planting Bench at Fisherman's Park (All Alternatives - High Restoration Empha

Description	Unit	Quantity	Unit Cost
Create Surface for Riparian Restoration	CY	21305.6	\$ 12
Bioengineering Structures	LF	2876.25	\$ 50
Total			

Reaches 2 and 3: Reconnect Riparian Habitat with Stream (All Alternatives, Medium Restoration Em

Description	Unit	Quantity	Unit Cost
Excavation	CY	89	\$ 12
Steel Pipe (48" x 12')	LF	12	\$ 96
Regulating Gate	LS	1	\$ 1,000
Back fill	CY	89	\$ 10
Total			
Reach 2 (one site): \$ 4,110			
Reaches 3 and 4 (two sites): \$ 8,220			

Reach 2: Benching on South Side of River (Alternative 3, Low Restoration Emphasis)

Description	Unit	Quantity	Unit Cost
Clearing and Grubbing	AC	62.2	\$ 3,000
Excavation	CY	875,842	\$ 12
Total			

Reach 2: Channel Reconfiguration (Alternatives 1 and 2, High Restoration Emphasis)

Description	Unit	Quantity	Unit Cost
Excavation	CY	27,426	\$ 12
Bioengineered Structures	LF	4,000	\$ 50
Total			

Reach 3: Major Geomorphic Project at Steamboat Creek (Alternatives 1 and 2, High Restoration Em

Description	Unit	Quantity	Unit Cost
Channel Reconfiguration (3,000 feet)	CY	277,777	\$ 12
Riparian Planting	AC	105	\$ 8,840
Bioengineered Structures	LF	6,000	\$ 50
Total			

Reaches 3 and 4: Bench on South Side of River (Alternative 3, Low Restoration Emphasis)

Description	Unit	Quantity	Unit Cost
Clearing and Grubbing	AC	146.2	\$ 3,000
Excavation	CY	1,778,225	\$ 12
Total			

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<i>sis)</i>	
Total Cost	
\$	255,667
\$	143,813
\$	399,480

<i>nphasis)</i>	
Total Cost	
\$	1,068
\$	1,152
\$	1,000
\$	890
\$	4,110

Total Cost	
\$	186,600
\$	10,510,104
\$	10,696,704

Total Cost	
\$	329,112
\$	200,000
\$	529,112

<i>nphasis)</i>	
Total Cost	
\$	3,333,324
\$	928,200
\$	300,000
\$	4,561,524

Total Cost	
\$	438,600
\$	21,338,700
\$	21,777,300

BASIS OF COST ESTIMATE

Planning and engineering design was estimated at 12 percent of account 06 (fish and wildlife facilities). Construction management was estimated at 8 percent of account 06 (fish and wildlife facilities). Estimated costs for high restoration emphasis include implementation costs of restoration measures at low and medium emphasis. Estimated costs for medium restoration emphasis include the implementation cost of restoration measures at a low emphasis. The following information provides the basis of cost estimates for values provided in the accompanying tables.

A. Stream Bank Measures

1. Manage natural regeneration on partially vegetated and barren banks:
Unit Cost: \$10/linear foot
Basis of Cost:
 - Moderate level of management (irrigation, herbivore protection, fertilization and weed control during three-year establishment period)

2. Partial riprap removal:
Unit Cost: \$2.30/linear foot
Basis of Cost:
 - 1,000 feet of bank per day could be removed
 - Cost of excavator (73000 lbs) and operator = \$1550/day
 - Cost of truck rental = \$80/hour – 10 hours
 - A portion of the riprap would be removed under medium restoration emphasis; the remaining riprap would be removed under high restoration emphasis.
 - Minimum mobilization = \$1,150

3. Streambank plantings of native riparian vegetation (willows and cottonwood):
Unit Cost: \$13/ linear foot
Basis of Cost:
 - One tree per linear foot of bank at \$10/tree
 - Moderate level of management (irrigation, fertilization and weed control during three-year establishment period) and availability of planting stock (willow cuttings from study area or nursery-grown cottonwoods from local seed).
 - Replant 30 percent to achieve ultimate survival rate of 80 percent.

4. Install bioengineered structures:
Unit Cost: \$50/linear foot
Basis of Cost:
 - Gabion structures, willow wattles, straw wattles.

5. Erosion control seeding (Hydro-seeding):
Unit Cost: \$2,500/acre

B. Riparian Forest Restoration Measures

1. Retain all existing native riparian trees. Manage for natural revegetation. Protect existing and future regeneration:
Unit Cost: \$600/acre
Basis of Cost:
 - Weeding, thinning, and herbivore protection over three-year period.

2. Interplant and expand forest boundaries or create riparian forests:
Unit Cost: \$8,840/acre
Basis of Cost:
 - 8 foot by 8 foot spacing or 680 trees/acre, at \$10/tree.
 - Moderate level of management (irrigation, fertilization and weed control during three-year establishment period) and availability of planting stock (willow cuttings from study area or nursery-grown cottonwoods from local seed).
 - Replant 30 percent to achieve ultimate survival rate of 80 percent.

3. Erosion Control Seeding (Hydro-seeding):
Unit Cost: \$2,500/acre

C. Exotic Species Control Measures

1. Remove all exotics, sources of exotics and white top control:
Unit Cost: \$1,000/acre
Basis of Cost:
 - Mechanical removal and herbicide treatment (e.g. garlon, rodeo, roundup).
 - Initial treatment and follow-up treatments for three years.

2. Replanting following removal of exotics:
Unit Cost: \$200/acre
Basis of Cost:
 - Plant approximately 15 trees per acre, @ \$10 each with moderate level of management (irrigation, fertilization and weed control during three-year establishment period), and 30 percent replanting.