APPENDIX D: COST ESTIMATES FOR STUDY REACHES

This appendix provides approximate quantity and cost information for the improvement measures identified in the reach tables in Appendix C. These estimates are for materials and installation costs only. They are approximate and should be considered order-of-magnitude level estimates. Project implementation will entail expenses for site-level plan design, engineering, permitting, monitoring, and maintenance in addition to the costs provided below. Additionally, the improvement measures included in the following tables are not intended to be exhaustive. It is anticipated that quantities and approaches may vary once site-specific design work is initiated for a given project or study reach.

Cost Assumptions

Estimates for each study reach are based on the unit cost assumptions listed in Table D1, which were derived from the unit costs listed in Table 4.6. Unit cost and quantity assumptions for specific improvement measures are described below. Unless otherwise noted below, the moderate unit cost values in Table D1 were typically used to generate the cost estimates for each study reach.

Stream Cleanup

The unit costs listed in Table D1 assume that cleanup events are completed using volunteer labor; the listed unit cost values are intended to partially cover the cost of supplies, disposal/landfill fees, and mileage to/from disposal sites. Low, moderate, and high cost values are provided to reflect the difference in expected disposal costs for reaches assessed as having low, moderate, or high amounts of trash.

Mechanized Trash Removal

The unit costs listed in Table D1 assume the use of paid labor; costs could be reduced via the use of in-kind government labor/equipment, or donated supplies. The "low" cost value reflects efforts that could be completed in less than 1 day and that would not involve significant disturbance for access. The "moderate" cost value reflects efforts that would require 2–3 work days to complete, involve use of heavy equipment, and require a moderate level of disturbance and revegetation. The "high" cost value reflects efforts that would require up to 1 week of work, extensive heavy equipment use, and extensive revegetation/stabilization measures after accessing the channel.

Invasive Plant Removal/Control

The per-acre unit cost from Table 4.6 ($750/acre) was used for the "moderate" cost value in Table D1. This cost was assumed to be appropriate for vegetation communities mapped as having a "moderate" invasive species class. Lower and higher costs ($600/acre and $900/acre, respectively) were assigned for use in areas with mapped invasive species classes of low or high/majority, respectively. Unit costs represent per-acre costs assuming three site visits (i.e., three separate mechanical and/or chemical treatments), which would cover 1 year of invasive plant removal/control work. Successful invasive plant removal and control typically requires 5–10 years of annual treatments.

Table D1. Unit cost assumptions used to generate cost estimates for each study reach.

IMPROVEMENT MEASURE	UNIT	UNIT COST [a]			SOURCE OF COST INFORMATION [b]
		Low	Moderate	High	
Invasive plant removal/control	acre	$600	$750	$900	BIO-WEST (2009)
Revegetation (seed)	acre	N/A	$3,000	N/A	BIO-WEST (2009)
Revegetation (erosion control blanket)	square yard	N/A	$3	N/A	UDOT 2008
Revegetation - live plant stakes	per stake	N/A	$3	N/A	BIO-WEST (2009)
Revegetation - 1-gallon containerized plants	per plant	N/A	$12	N/A	UDOT 2008
Revegetation - 5-gallon containerized plants	per plant	N/A	$75	N/A	UDOT 2008
Revegetation - 2-inch caliper trees	per plant	N/A	$250	N/A	UDOT 2008
Slope flattening or terracing	square yard	N/A	$5	N/A	UDOT 2008
Remove asphalt pavement	square yard	N/A	$4	N/A	UDOT 2008
Vegetated soil lifts	linear foot	N/A	$45	N/A	DPU (2009)
Vegetated rock revetment	linear foot	N/A	$65	N/A	DPU (2009)
Gabion basket retrofit	linear foot	N/A	$65	N/A	BIO-WEST (2010)
Rip rap retrofit	linear foot	N/A	$25	N/A	BIO-WEST (2010)
Stream cleanup	per event	$125	$250	$500	BIO-WEST (2009)
Mechanized trash removal	per event	$500	$3,000	$7,500	DPU (2009)
Storm drain improvement (rock outlet and swale)	per outfall	$900	$1,800	$2,800	DPU (2009)
Runoff management (vegetated rock-lined swale)	linear foot	$25	$77	N/A	DPU (2009), BIO-WEST (2010)
Runoff management (grading)	cubic yard	N/A	$10	N/A	UDOT 2008
Runoff management (coir fiber rolls)	linear foot	N/A	$6	N/A	UDOT 2008, UDOT 2009
Pre-fabricated bridge (30–45 feet long, 6–15 feet wide)	each	$30,000	$70,000	100,000	supplier estimate, BIO-WEST (2009)
Open-bottom box culvert (12 feet wide or greater)	linear foot	$2,500	$4,500	$6,500	DPU (2009)
Rock-lined tailwater pool	each	N/A	$20,000	N/A	DPU (2009)
Rock step pool	each	N/A	$4,000	N/A	Schueler and Brown 2004
Stream daylighting	linear foot	N/A	$200	N/A	Schueler and Brown 2004
Bank stabilization	linear foot	$35	$75	$110	DPU, BIO-WEST (2009)
Grade control (vortex rock weir)	each	N/A	$2,100	N/A	Schueler and Brown 2004
Floodplain re-establishment	cubic yard	N/A	$10	N/A	UDOT 2008
Access control (split rail fence)	linear foot	N/A	$10	N/A	supplier estimate, BIO-WEST (2009)
Access trail stabilization (steps)	linear foot	N/A	$50	N/A	BIO-WEST (2009)
Access trail stabilization (pervious access ramp)	each	$5,000	$7,500	$10,000	BIO-WEST (2010)
Access trail reclamation	linear foot	N/A	$8	N/A	BIO-WEST (2010)
Concrete mow strip	linear foot	N/A	$10	N/A	BIO-WEST (2010)
Interpretive display	each	$1,000	$2,500	$5,000	BIO-WEST (2010)

[a] Unit costs will typically be on the low end of the indicated range for large-scale projects that involve large quantities and on the high end of the range for small-scale projects. Unit costs will also vary depending on whether access for equipment is easy or difficult and whether constraints associated with infrastructure and utility lines are an issue.

[b] See Table 4.6 and text above for more details.

Storm Drain Improvement

The average Table 4.6 unit costs for "outlet protection using vegetated rock" and "vegetated rock-lined swale" were used to calculate approximate per-outfall costs for low, moderate, and high-cost storm drain improvements. For each outfall, the relevant per-outfall cost was assigned based on the assessed size and condition of the outfall. A low-cost outfall improvement includes 10 linear feet of swale and 1.25 square yards of vegetated rock outlet protection; a moderate-cost improvement includes 20 linear feet of swale and 2.5 square yards of vegetated rock outlet protection; a high-cost outlet improvement includes about 30 linear feet of swale and 5 square yards of vegetated rock outlet protection.

Pre-fabricated Bridge

The materials-only cost for either a railroad flatcar (89 feet long x 8.5 feet wide) or pre-fabricated pedestrian truss bridge (30 feet long x 6 feet wide) is about $23,000; this value was multiplied by three to provide an approximate order-of-magnitude estimate for materials and installation of this type of bridge. This value ($70,000/bridge) also includes removal of the old culvert, fill dirt excavation, and needed channel and bank work associated with bridge installation. For installations in areas with easy equipment access and fewer infrastructure constraints, costs will likely be lower and the low unit cost value in Table D1 may provide a more accurate estimate.

Open-bottom Box Culvert

Based on price estimates from suppliers, the materials-only cost for a 12-foot by 6-foot box culvert is about $625/linear foot. However, based on the experience of DPU engineering staff with a 2009 culvert replacement project on Emigration Creek, material costs tend to be a relatively minor proportion of the total project cost relative to installation costs. Installation costs at most crossings will be very high due to the depth of the existing culvert pipes, amount of fill material, challenging access conditions, and constraints associated with existing sewer lines, storm drain pipes, water lines, and other infrastructure. Therefore, based on input from DPU, a materials and installation unit cost of $4,500/linear foot was used for culvert replacement cost estimates (Table D1). For installations in areas with easy equipment access and fewer infrastructure constraints, costs will likely be lower and the low unit cost value in Table D1 may provide a more accurate estimate.

Rock-lined Tailwater Pool

The Table 4.6 per-cubic yard costs for "rock-lined tailwater pool" and "vegetated rock revetment" were used to calculate an approximate per-pool cost for this improvement measure. The Table D1 value of $20,000 per pool assumes installation of 60 linear feet of vegetated rock revetment and about 170 cubic yards of excavation and rock installation (adequate for a rock-lined tailwater pool approximately 30 feet long and wide). For culvert outlets assessed as having particularly high outlet velocities and scour/erosion problems, one to two additional rock step-pools at $4,000/step-pool (Table 4.6) were included in the culvert outlet protection cost estimate for the reach.

Runoff Management/Vegetated Rock-Lined Swale

In certain Parleys Creek study reaches, problems associated with roadway drainage such as rills and gullies were observed. In these reaches, installation of a vegetated rock-lined swale is generally recommended as a rill repair technique. In some cases a more comprehensive investigation of roadway drainage needs would be beneficial but

was beyond the scope of the RCS study. For reaches where long lengths of vegetated rock-lined swale are recommended, the "low" unit cost value (Table D1) was used because such installations involve large material quantities. This same unit cost value was also used for estimating the cost of restoring tributary spring channels because such efforts would require less rock than a typical vegetated rock-lined swale.

Bank Stabilization

Bank stabilization projects should be implemented at a reach-scale and require site-specific design and engineering to select the most appropriate combination of techniques. Selection of specific techniques is beyond the scope of this study; therefore, some general assumptions were used to generate the cost estimates provided in the tables in this appendix. In areas where equipment access is good, side slopes are gentle, and stability problems do not threaten infrastructure, a "low" unit cost value of $35/linear foot was used. The $35/linear foot value is in the cost range for "softer" stabilization techniques such as soil lifts or slope terracing. For reaches assessed as having stability problems that would likely require incorporation of "harder" techniques such as toe protection, a "moderate" unit cost value of $75/linear foot was used. For reaches where equipment access is challenging, slopes are steep and confined, or nearby infrastructure must be protected, a "high" unit cost value of $110/linear foot was used. This value is in the cost range for techniques such as A-jacks toe protection and vegetated modular block retaining walls (Table 4.6). To determine costs for each study reach, the relevant unit cost values were typically applied to one-third or one-half of the total bank length (i.e., both left and right banks) depending on the assessed need for stability improvements within the study reach.

No-mow Buffer Establishment

On Parleys Creek, establishment of no-mow buffer areas is recommended for stream reaches within the Country Club golf course and Sugar House Park where the riparian corridor includes or is adjacent to areas of manicured turf. In the tables estimating costs for each study reach, costs associated with establishing native plants within the no-mow buffer areas are included under the revegetation line items. For the Sugar House Park reaches, costs to install a concrete mow strip to delineate the edge of the no-mow buffer are also included. Within the Country Club reaches, no costs for a concrete mow strip are included because existing paved golf cart paths adjacent to the streambank could be used to delineate the edge of the no-mow buffer.

Cost Estimates by Reach

The following tables (D2–D16) provide approximate cost information for each study reach. As discussed above, the cost values provided in this appendix include materials and initial installation, but do not include site-specific design, engineering, permitting, monitoring, or maintenance costs. Maintenance and monitoring costs can be significant, particularly for projects involving invasive species control and revegetation (see Table 4.8). The tables below provide costs for each type of improvement measure and are also totaled for each reach.

Cost Summaries

Total costs for each reach are summarized in Table D17.

Table D2. Estimated approximate costs for reach UPC_R16A (Upper Suicide Rock).

IMPROVEMENT MEASURE	QUANTITY	UNIT	APPROXIMATE COST
Invasive plant removal/control	2.2	acres	$1,700
Revegetation - understory (seed)	0.4	acre	$1,200
Revegetation - understory (erosion control blanket)	1,860	square yards	$5,580
Stream cleanup	1	event (low cost)	$125
Mechanized trash removal	1	event (high cost)	$7,500
Slope stabilization (terracing)	1,860	square yards	$9,300
Remove/replace concrete flume (full-span bridge)	1	each	$70,000
Remove/replace concrete flume (restore natural channel)	75	linear feet	$15,000
Access trail stabilization (steps)	40	linear feet	$2,000
Access control (fence)	80	linear feet	$800
Access trail reclamation	525	linear feet	$4,200
		TOTAL	$117,405

Table D3. Estimated approximate costs for reach UPC_R16B (Lower Suicide Rock).

IMPROVEMENT MEASURE	QUANTITY	UNIT	APPROXIMATE COST
Invasive plant removal/control	2.9	acres	$2,270
Stream cleanup	1	event (high cost)	$500
Mechanized trash removal	1	event (high cost)	$7,500
Storm drain improvement	2	outfalls	$3,600
Biotechnical slope stabilization (rock revetment)	60	linear feet	$3,900
Biotechnical slope stabilization (terracing)	120	square yards	$600
Access control (fence)	130	linear feet	$1,300
Access trail stabilization (steps)	80	linear feet	$4,000
Access trail stabilization (pervious access ramp)	1	each	$7,500
Access trail reclamation	40	linear feet	$320
Runoff management (fiber rolls)	200	linear feet	$1,200
Runoff management (two stabilized outfalls)	2	outfalls	$1,800
		TOTAL	$34,490

Table D4. Estimated approximate costs for reach LPC_R01A1B (Upper Parleys Park).

IMPROVEMENT MEASURE	QUANTITY	UNIT	APPROXIMATE COST
Invasive plant removal/control	10.40	acres	$7,390
Revegetation - understory (seed)	3.92	acres	$11,760
Revegetation -understory (erosion control blanket)	7,590	square yards	$22,770
Biotechnical slope stabilization (high cost)	200	linear feet	$22,000
Access control (fence)	3,416	linear feet	$34,160
Access trail stabilization (steps)	100	linear feet	$5,000
Access trail stabilization (pervious access ramp)	1	each	$7,500
Access trail reclamation	760	linear feet	$6,080
Strom drain improvement	1	outfall (high cost)	$2,800
Stream/graffiti cleanup	1	event (moderate cost)	$250
Mechanized trash removal	1	event (moderate cost)	$3,000
Runoff management (vegetated rock-lined swale)	400	linear feet	$10,000
Fill removal/ floodplain re-establishment	980	cubic yards	$9,800
Bank stabilization at fill removal	180	linear feet	$6,300
Restoration/protection of spring	100	linear feet	$2,500
		TOTAL	$151,310

Table D5. Estimated approximate costs for reach LPC_R02 (Middle Parleys Park).

IMPROVEMENT MEASURE	QUANTITY	UNIT	APPROXIMATE COST
Invasive plant removal/control	5.9	acres	$2,930
Revegetation - understory (seed)	3.8	acres	$11,430
Revegetation -understory (erosion control blanket)	7,370	square yards	$22,110
Rip rap retrofit	190	linear feet	$4,750
Access control (fence)	3,318	linear feet	$33,180
Access trail stabilization (steps)	100	linear feet	$5,000
Access trail stabilization (pervious access ramp)	1	each	$7,500
Access trail reclamation	790	linear feet	$6,320
Mechanized trash removal	1	event (low cost)	$500
Fill removal/floodplain re-establishment	920	cubic yards	$9,200
Bank stabilization	830	linear feet	$29,050
Restoration/protection of springs (vegetated swale)	75	linear feet	$1,875
Restoration/protection of springs (fence)	150	linear feet	$1,500
		TOTAL	$135,345

Table D6. Estimated approximate costs for reach LPC_R03 (Lower Parleys Park).

IMPROVEMENT MEASURE	QUANTITY	UNIT	APPROXIMATE COST
Invasive plant removal/control	4.0	acres	$3,260
Revegetation - understory (seed)	1.1	acre	$3,300
Revegetation - understory (erosion control blanket)	2,720	square yards	$8,160
Revegetation (shrub)	163	1-gallon plants	$1,960
Access control (fence)	815	linear feet	$8,150
Access trail stabilization (steps)	25	linear feet	$1,250
Access trail stabilization (pervious access ramp)	2	each	$15,000
Access trail reclamation	430	linear feet	$3,440
Floodplain re-establishment (excavation)	450	cubic yards	$4,500
Floodplain re-establishment (bank stabilization)	410	linear feet	$14,350
Retrofit/remove metal grate structure	1	event	$7,500
		TOTAL	$70,870

Table D7. Estimated approximate costs for reach LPC_R04A (Country Club - Above 2300 East).

IMPROVEMENT MEASURE	QUANTITY	UNIT	APPROXIMATE COST
Invasive plant removal/control	5.7	acres	$4,680
Revegetation (canopy)	5	2-inch caliper trees	$1,250
Revegetation (shrub)	6	1-gallon plants	$70
Restoration of native understory plants (seed)	1.1	acres	$3,300
Restoration of native understory plants (erosion control blanket)	2,000	square yards	$6,000
Stream cleanup	1	event (high cost)	$500
Mechanized trash removal	1	event (high cost)	$7,500
Replace concrete diversion weir	2	rock step-pools	$8,000
Storm drain improvement	2	outfalls	$1,800
Gabion basket retrofit	786	linear feet	$51,090
Rip rap retrofit	45	linear feet	$1,130
Biotechnical slope stabilization	200	linear feet	$15,000
Establish "no-mow" buffer	N/A	N/A	N/A [a]
Avoid placing grass clippings on banks	N/A	N/A	N/A
		TOTAL	$100,320

[a] Costs included under revegetation/native understory restoration line items.

Table D8. Estimated approximate costs for reach LPC_R04B (Country Club - Below 2300 East).

IMPROVEMENT MEASURE	QUANTITY	UNIT	APPROXIMATE COST
Invasive plant removal/control	2.90	acres	$2,440
Revegetation (canopy)	30	2-inch caliper trees	$7,500
Revegetation (shrub)	350	1-gallon plants	$4,200
Restoration of native understory plants (seed)	0.20	acre	$600
Restoration of native understory plants (erosion control blanket)	1,000	square yards	$3,000
Bank/slope stabilization	725	linear feet	$54,380
Stream cleanup	1	event (high cost)	$500
Mechanized trash removal	1	event (high cost)	$7,500
Storm drain improvement	2	outfalls	$4,600
Access trail stabilization (steps)	30	linear feet	$1,500
Access trail reclamation	80	linear feet	$640
Implement storm water BMPs	N/A	N/A	N/A
Replace stream crossing with full-span structure	6.5	linear feet	$29,250
Replace stream crossing with full-span structure	12.5	linear feet	$56,250
Establish "no mow" buffer	N/A	N/A	N/A [a]
		TOTAL	$172,360

[a] Costs included under revegetation/native understory restoration line items.

Table D9. Estimated approximate costs for reach LPC_R04C (Country Club - Above 2000 East).

IMPROVEMENT MEASURE	QUANTITY	UNIT	APPROXIMATE COST
Invasive plant removal/control	5.40	acres	$4,550
Revegetation (canopy)	40	2-inch caliper trees	$10,000
Revegetation (shrub)	796	1-gallon plants	$9,550
Mechanized trash removal	1	event (moderate cost)	$3,000
Storm drain improvement	3	outfalls	$8,400
Bank stabilization	550	linear feet	$41,250
Grade control	9	vortex rock weirs	$18,900
Remove obsolete bridge	1	event	$3,000
Rip rap retrofit	140	linear feet	$3,500
		TOTAL	$102,150

Table D10. Estimated approximate costs for reach LPC_R04D (Country Club - Below 2000 East).

IMPROVEMENT MEASURE	QUANTITY	UNIT	APPROXIMATE COST
Invasive plant removal/control	5	acres	$3,550
Revegetation - canopy	63	2-inch caliper trees	$15,750
Revegetation - shrub	252	1-gallon plants	$3,020
Restoration of native understory plants (seed)	0.60	acre	$1,800
Restoration of native understory plants (erosion control blanket)	2,770	square yards	$8,310
Culvert outlet protection	1	rock step-pool	$4,000
Stream cleanup	1	event (low cost)	$125
Mechanized trash removal	1	event (low cost)	$500
Storm drain improvement	4	outfalls	$8,300
Gabion basket retrofit	158	linear feet	$10,270
Slope flattening/bank stabilization	200	linear feet	$15,000
Establish "no mow" buffer	N/A	N/A	N/A [a]
		TOTAL	$70,625

[a] Costs included under revegetation/native understory restoration line items.

Table D11. Estimated approximate costs for reach LPC_R04E (Country Club - Above 1700 East).

IMPROVEMENT MEASURE	QUANTITY	UNIT	APPROXIMATE COST
Invasive plant removal/control	2.65	acres	$2,340
Restoration of native understory plants (seed)	0.8	acre	$2,400
Restoration of native understory plants (erosion control blanket)	2,440	square yards	$7,320
Stream cleanup	1	event (low cost)	$125
Mechanized trash removal	1	event (moderate cost)	$3,000
Storm drain improvement	2	outfalls	$3,600
Biotechnical slope stabilization (rill repair)	40	linear feet vegetated swale	$3,080
Gabion basket retrofit	336	linear feet	$21,840
Bank stabilization	731	linear feet	$80,410
Grade control	7	vortex rock weirs	$14,700
Retrofit concrete wingwall protection (concrete removal)	1	event	$3,000
Retrofit concrete wingwall protection (install vegetated rock)	60	linear feet	$3,900
		TOTAL	$145,715

Table D12. Estimated approximate costs for reach LPC_R05A (Upper Sugar House Park).

IMPROVEMENT MEASURE	QUANTITY	UNIT	APPROXIMATE COST
Invasive plant removal/control	1.5	acres	$1,360
Restoration of native understory plants (seed)	0.8	acre	$2,400
Restoration of native understory plants (erosion control blanket)	1,030	square yards	$3,090
Stream cleanup	1	event (low cost)	$125
Retrofit concrete wingwall protection (concrete removal)	1	event	$3,000
Retrofit concrete wingwall protection (install vegetated rock)	60	linear feet	$3,900
Storm drain improvement	3	outfalls	$6,400
Bank stabilization (toe protection/shrub planting)	619	linear feet	$46,425
Grade control	6	vortex rock weirs	$12,600
Access control (fence)	1,238	linear feet	$12,380
Access trail stabilization (steps)	60	linear feet	$3,000
Access trail stabilization (pervious access ramp)	1	each	$7,500
Access trail reclamation	40	linear feet	$320
Establish "no mow" buffer (install concrete mow strip)	1,238	linear feet	$12,380 [a]
		TOTAL	$114,880

[a] Other no-mow buffer costs included under revegetation/native understory restoration line items.

Table D13. Estimated approximate costs for reach LPC_R05B (Sugar House Park - Near Highland High Track).

IMPROVEMENT MEASURE	QUANTITY	UNIT	APPROXIMATE COST
Invasive plant removal/control	2.2	acres	$1,750
Restoration of native understory plants (seed)	1.1	acres	$3,300
Restoration of native understory plants (erosion control blanket)	1,320	square yards	$3,960
Stream cleanup	1	event (moderate cost)	$250
Storm drain improvement	2	outfalls	$3,600
Bank stabilization (toe protection)	520	linear feet	$39,000
Grade control	8	vortex rock weirs	$16,800
Access control (fence)	993	linear feet	$9,930
Access trail stabilization (steps)	40	linear feet	$2,000
Access trail reclamation	793	linear feet	$6,340
Establish "no mow" buffer (install concrete mow strip)	793	linear feet	$7,930 [a]
Retrofit concrete headwall (concrete removal)	1	event	$3,000
Retrofit concrete wingwall protection (install vegetated rock)	60	linear feet	$3,900
		TOTAL	$101,760

[a] Other no-mow buffer costs included under revegetation/native understory restoration line items.

Table D14. Estimated approximate costs for reach LPC_R05C (Middle Sugar House Park).

IMPROVEMENT MEASURE	QUANTITY	UNIT	APPROXIMATE COST
Invasive plant removal/control	3.3	acres	$2,450
Restoration of native understory plants (seed)	2.5	acres	$7,500
Restoration of native understory plants (erosion control blanket)	2,870	square yards	$8,610
Culvert replacement with open-bottom box (eastern road crossing)	75	linear feet	$337,500
Stream cleanup	1	event (low cost)	$125
Mechanized trash removal	1	event (low cost)	$500
Replace pedestrian crossing with full-span structure	12	linear feet	$54,000
Storm drain improvement	1	outfall	$1,800
Access control (fence)	2,294	linear feet	$22,940
Access trail stabilization (steps)	80	linear feet	$4,000
Access trail stabilization (pervious access ramp)	2	each	$15,000
Access trail reclamation	120	linear feet	$960
Bank stabilization (toe protection/shrub planting)	757	linear feet	$56,780
Grade control/retrofit bed structures (remove existing)	1	event	$7,500
Grade control/retrofit bed structures	12	vortex rock weirs	$25,200
Establish "no mow" buffer (install concrete mow strip)	2,294	linear feet	$22,940 [a]
		TOTAL	$567,805

[a] Other no-mow buffer costs included under revegetation/native understory restoration line items.

Table D15. Estimated approximate costs for reach LPC_R05D (Sugar House Park - Below Pond).

IMPROVEMENT MEASURE	QUANTITY	UNIT	APPROXIMATE COST
Invasive plant removal/control	0.53	acre	$480
Restoration of native understory plants (seed)	0.26	acre	$780
Restoration of native understory plants (erosion control blanket)	290	square yards	$870
Remove existing concrete outlet/bank protection	1	event	$3,000
Replace with biotechnical outlet/bank protection (vegetated rock)	120	linear feet	$7,800
Access control (fence)	176	linear feet	$1,760
Access trail stabilization (steps)	40	linear feet	$2,000
Access trail reclamation	40	linear feet	$320
Revegetate pond shoreline near inflow (shrub plantings)	70	1-gallon plants	$840
Revegetate pond shoreline near inflow (wetland seed)	0.20	acre	$600
Revegetate pond shoreline near inflow (erosion control blanket)	970	square yards	$2,910
Naturalize pond shoreline near inflow (grading)	970	cubic yards	$9,700
Establish "no mow" buffer (install concrete mow strip)	352	linear feet	$3,520 [a]
		TOTAL	$34,580

[a] Other no-mow buffer costs included under revegetation/native understory restoration line items.

Table D16. Estimated approximate costs for reach LPC_R06 (Hidden Hollow).

IMPROVEMENT MEASURE	QUANTITY	UNIT	APPROXIMATE COST
Invasive plant removal/control	2.5	acres	$2,000
Revegetation -native understory (seed)	0.93	acre	$2,790
Revegetation -native understory (erosion control blanket)	2,680	square yards	$8,040
Biotechnical slope stabilization (soil lifts)	275	linear feet	$12,380
Stream cleanup	1	event (moderate cost)	$250
Mechanized trash removal	1	event (low cost)	$500
Storm drain improvement	3	outfalls	$5,400
Resolve erosion at flood control access point	N/A	N/A	N/A
Access trail stabilization (steps)	80	linear feet	$4,000
Access control (fence)	803	linear feet	$8,030
Access trail reclamation	60	linear feet	$480
Grade control/retrofit bed structures (remove existing)	1	event	$7,500
Grade control/retrofit bed structures	5	vortex rock weirs plus two step-pools	$18,500
		TOTAL	$69,870

Table D17. Summary of estimated approximate costs for improvement measures by reach.

REACH NUMBER	REACH DESCRIPTION	REACH LENGTH (feet)	APPROXIMATE COST ESTIMATE FOR INITIAL IMPLEMENTATION OF IMPROVEMENT MEASURES [a]
UPC_R16A	Upper Suicide Rock [b]	667	$117,405
UPC_R16B	Lower Suicide Rock	832	$34,490
LPC_R01A01B	Upper Parleys Park	1,487	$151,310
LPC_R02	Middle Parleys Park	1,659	$135,345
LPC_R03	Lower Parleys Park	815	$70,870
LPC_R04A	Country Club - Above 2300 East	1,681	$100,320
LPC_R04B	Country Club - Below 2300 East [c]	1,748	$172,360
LPC_R04C	Country Club - Above 2000 East	1,285	$102,150
LPC_R04D	Country Club - Below 2000 East	1,661	$70,625
LPC_R04E	Country Club - Above 1700 East	731	$145,715
LPC_R05A	Upper Sugar House Park	619	$114,880
LPC_R05B	Sugar House Park - Near Highland High Track	793	$101,760
LPC_R05C	Middle Sugar House Park [d]	1,147	$567,805
LPC_R05D	Sugar House Park - Below Pond	176	$34,580
LPC_R06	Hidden Hollow	803	$69,870
		TOTAL FOR PARLEYS CREEK CORRIDOR	$1,989,485

[a] Estimated cost values include materials and installation but do not include site-specific design, engineering, permitting, monitoring, or maintenance costs.
[b] Cost for this reach includes $85,000 for replacement of flume/pedestrian bridge; see Table 5.2 for details.
[c] Cost for this reach includes $85,500 for replacement of two stream crossing structures; see Table 5.2 for details.
[d] Cost for this reach includes $391,500 for replacement of two stream crossing structures; see Table 5.2 for details.