

Appendix D

Stream Habitat Restoration Conceptual Designs

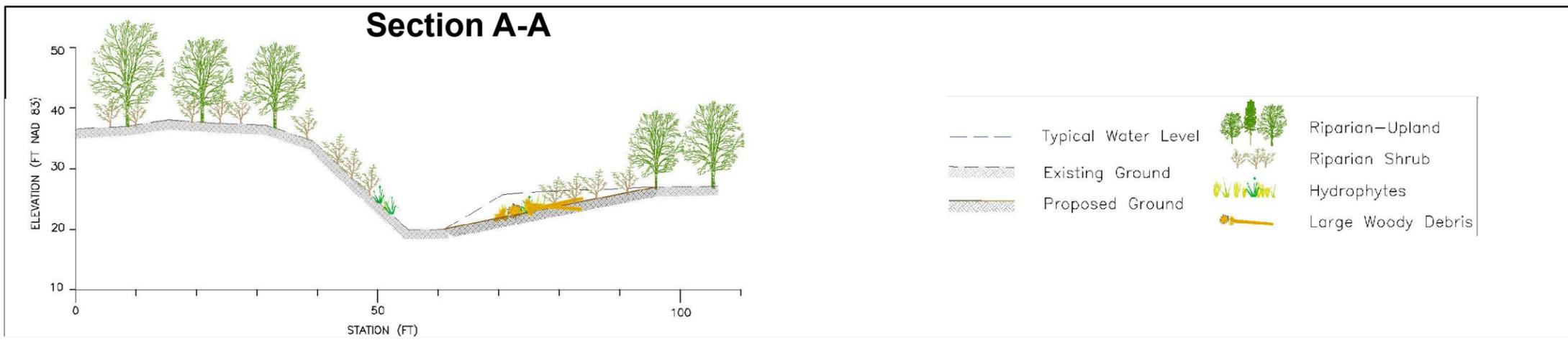
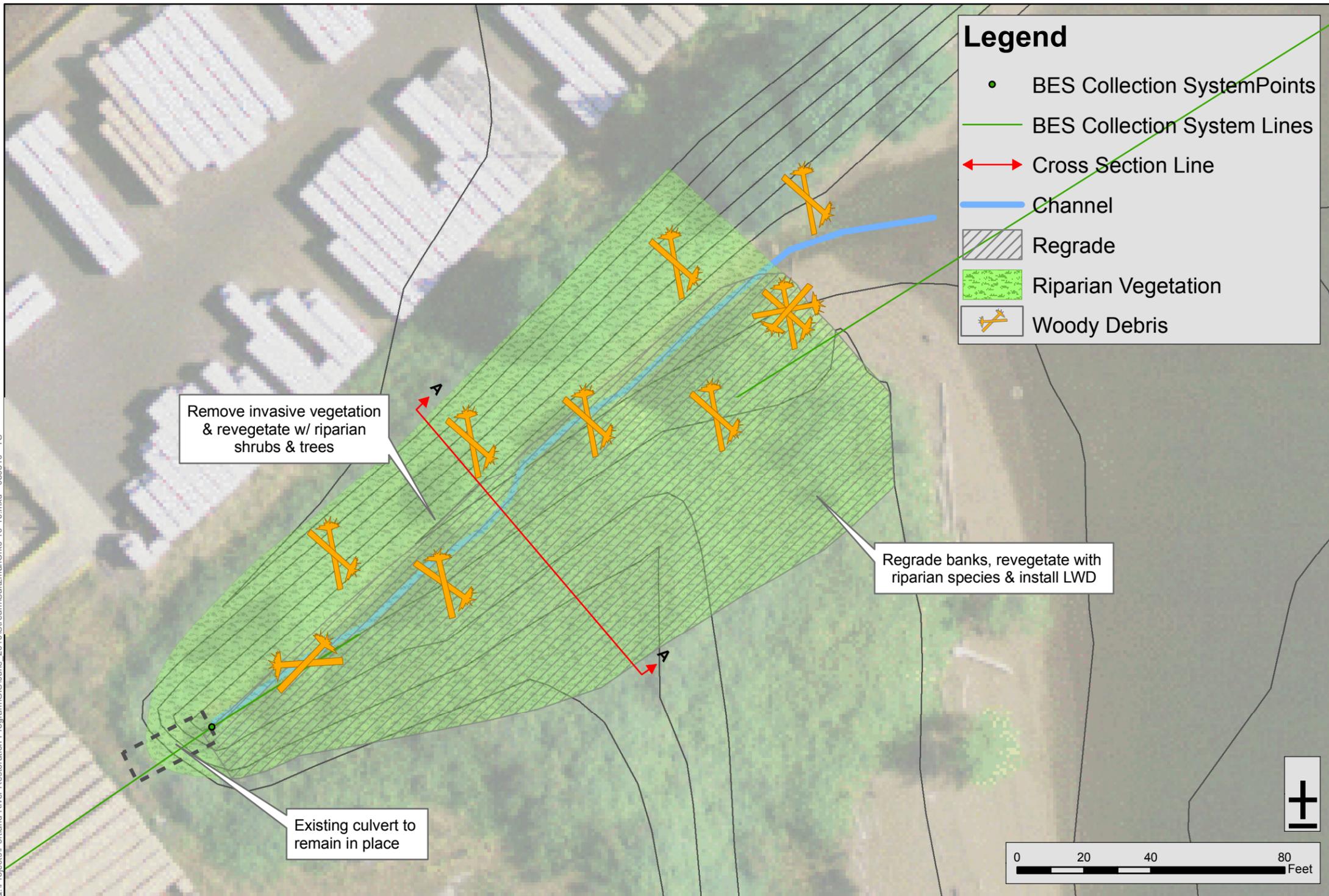
Saltzman Creek

North Reach Mitigation Bank Stream Habitat Restoration



Cost Estimate

Line Item	Quantity	Units	Unit Cost	Cost
Site Preparation	1	LS	\$ 43,754	\$ 43,754
Dewatering & Turbidity Control	1	LS	\$ 21,000	\$ 21,000
Demo of Structures	-	TN	\$ 200	\$ -
Special Utility Protection/Relocation	-	LS	\$ 100,000	\$ -
Place Fish Passable Culvert	-	LF	\$ 2,000	\$ -
Place Streambed Material	260	TN	\$ 100	\$ 26,000
Regrade Banks	1,280	TN	\$ 35	\$ 44,800
Road Reconstruction	-	SF	\$ 30	\$ -
Plant Erosion Control Fabric	4,500	SY	\$ 3.50	\$ 15,750
Plant Near-Shore Vegetation	0.5	AC	\$ 18,000	\$ 7,713
Place Large Woody Debris	41	EA	\$ 1,000	\$ 41,000
General Markups	1	LS	\$ 330,029	\$ 330,029
Total Cost (Rounded)				\$ 531,000



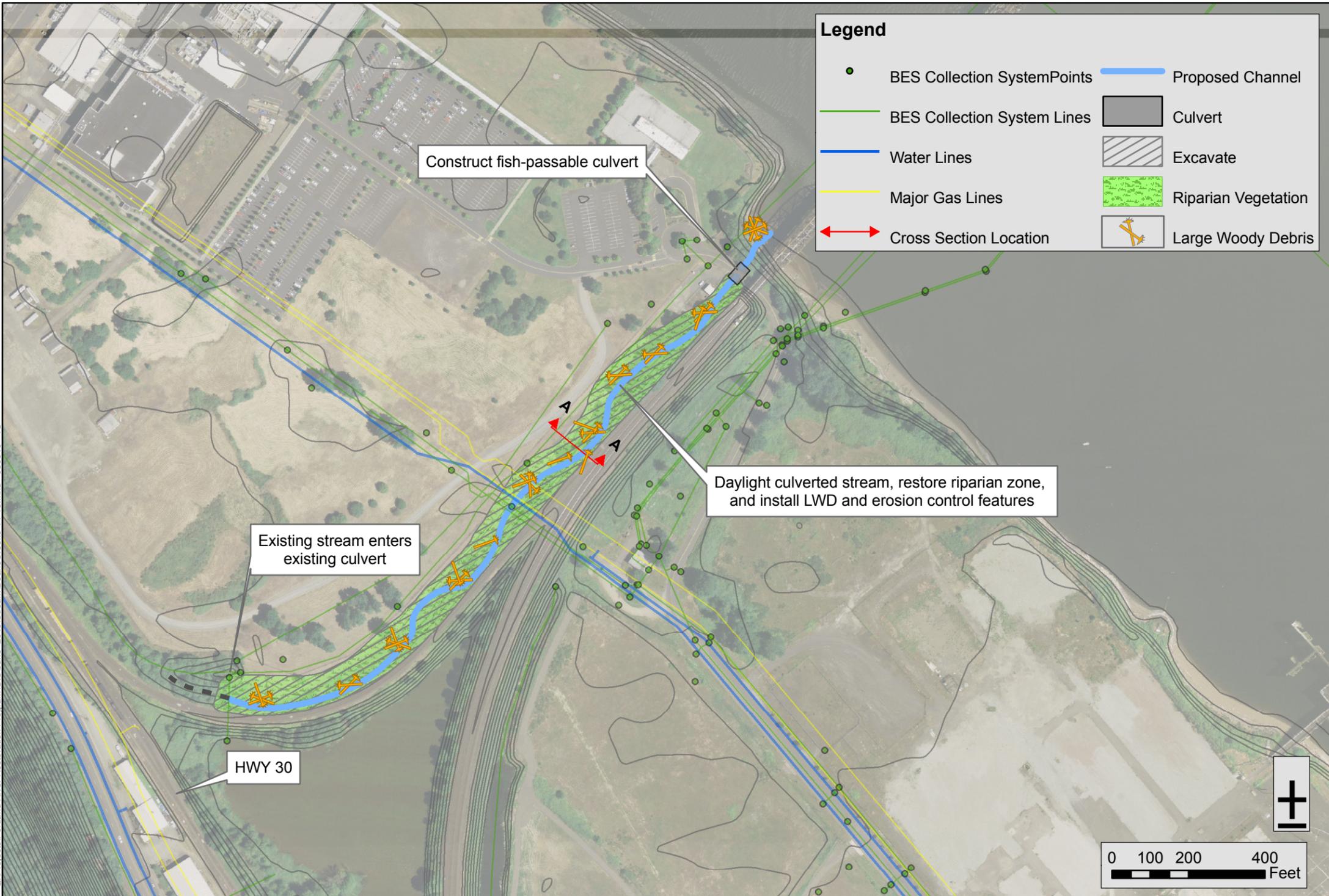
Doane Creek

North Reach Mitigation Stream Habitat Restoration

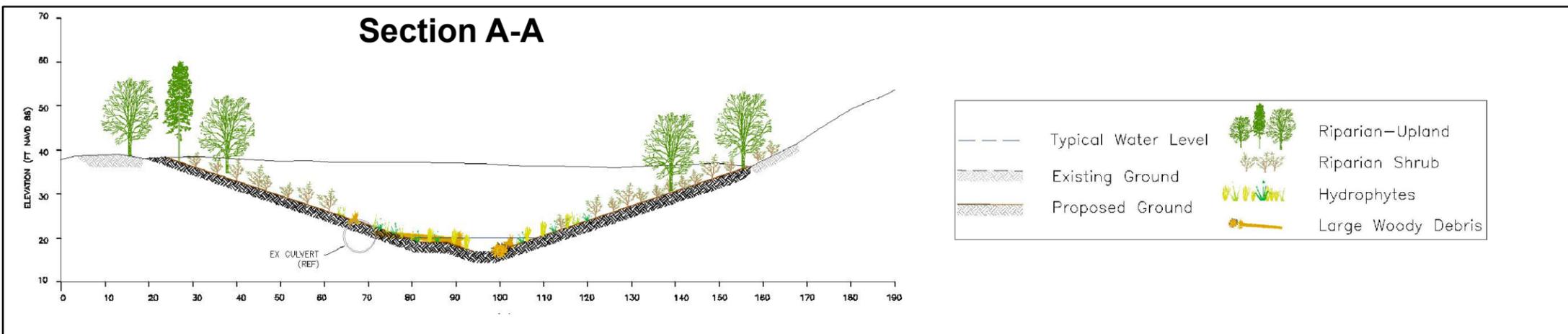


Cost Estimate

Line Item	Quantity	Units	Unit Cost	Cost
Site Preparation	1	LS	\$ 2,461,197	\$ 2,461,197
Dewatering & Turbidity Control	1	LS	\$ 1,147,000	\$ 1,147,000
Demo of Structures	1,700	TN	\$ 200	\$ 340,000
Special Utility Protection/Relocation	1	LS	\$ 100,000	\$ 100,000
Place Fish Passable Culvert	50	LF	\$ 2,000	\$ 100,000
Place Streambed Material	1,520	TN	\$ 152,000	\$ 152,000
Regrade Banks	168,296	TN	\$ 35	\$ 5,890,370
Road Reconstruction	4,000	SF	\$ 30	\$ 120,000
Place Erosion Control Fabric	165,650	SY	\$ 3.50	\$ 579,775
Plant Near-Shore Vegetation	3.8	AC	\$ 16,000	\$ 60,845
Place Large Woody Debris	300	EA	\$ 1,000	\$ 300,000
General Markups	1	LS	\$ 18,564,459	\$ 18,564,459
Total Cost (Rounded)				\$ 29,816,000



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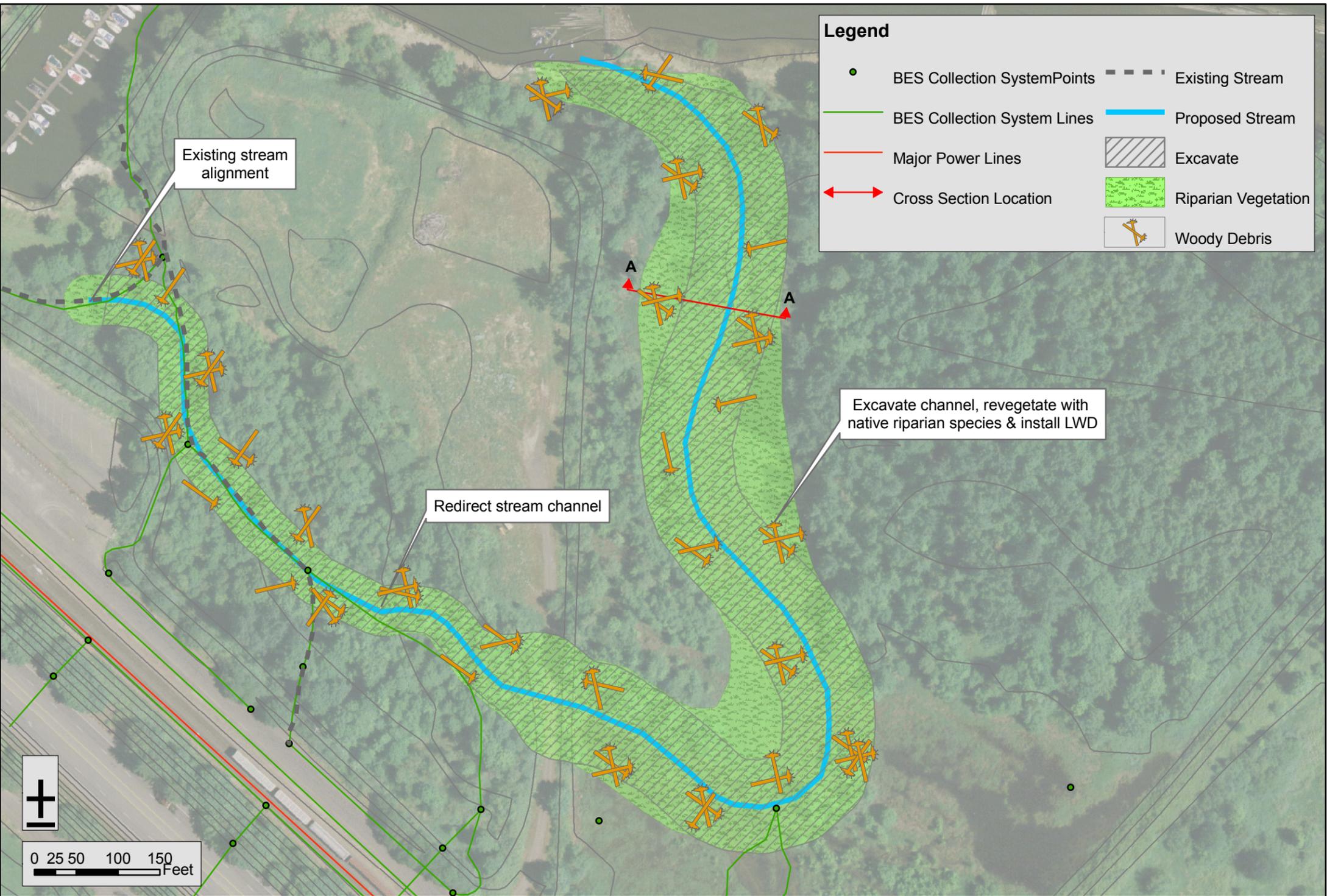
Miller Creek Confluence

North Reach Mitigation Bank Stream Habitat Restoration

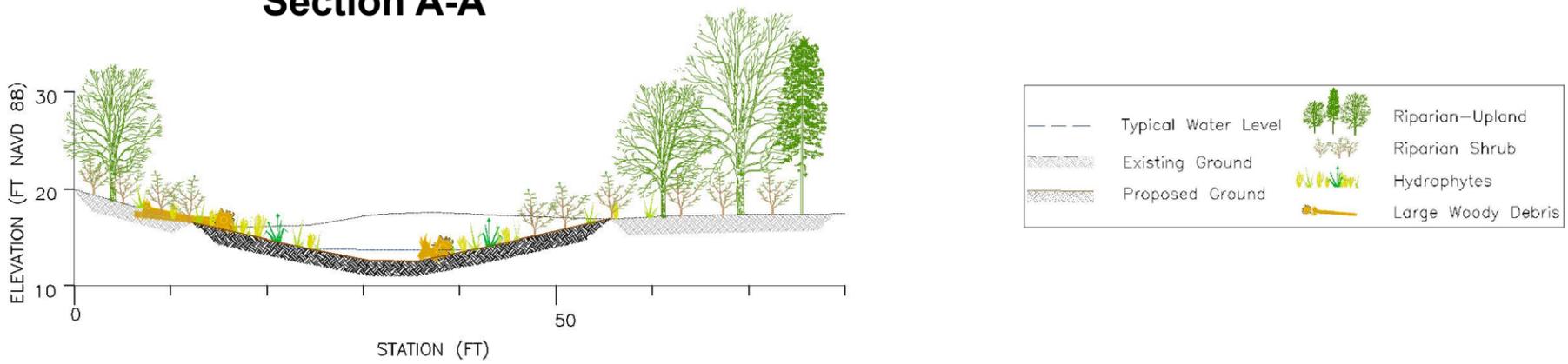


Cost Estimate

Line Item	Quantity	Units	Unit Cost	Cost
Site Preparation	1	LS	\$ 565,732	\$ 565,732
Dewatering & Turbidity Control	1	LS	\$ 242,000	\$ 242,000
Place Streambed Material	1,670	TN	\$ 100	\$ 167,000
Regrade Banks	14,341	TN	\$ 35	\$ 501,926
Plant Erosion Control Fabric	197,550	SY	\$ 3.50	\$ 691,425
Plant Near-Shore Vegetation	5.5	AC	\$ 16,000	\$ 88,121
Place Large Woody Debris	330	EA	\$ 1,000	\$ 330,000
General Markups	1	LS	\$ 4,267,237	\$ 4,267,237
Total Cost (Rounded)				\$ 6,854,000



Section A-A



Appendix E

Updated Restoration Site Cost Estimates



— CITY OF PORTLAND —
ENVIRONMENTAL SERVICES



1120 SW Fifth Avenue, Room 1000, Portland, Oregon 97204 ■ Dan Saltzman, Commissioner ■ Dean Marriott, Director

M E M O R A N D U M

June 9, 2009

TO: Sallie Edmunds
Bureau of Planning and Sustainability

FROM: Paul Ketcham, Kristen Acock
Watershed Services Group

RE: Updated Restoration Site Cost Estimates
North Reach Plan

The purpose of this memo is to further clarify cost estimates for the restoration sites identified in the North Reach Plan. Direct construction costs are defined as the amount paid to a contractor to construct projects according to plans and specifications. Other project costs include acquisition and clean-up to pre-design and design through construction, maintenance and monitoring. Although a small portion of the overall budget, monitoring is an important and often forgotten component of restoration budgets.

BES Watershed Services staff have not provided estimates for acquisition or clean-up. These items are being addressed by North Reach Plan staff.

Using unit prices provided primarily by North Reach Plan staff and quantity estimates by BES staff¹, we developed construction cost estimates for each site. The unit prices were for construction activity costs only and did not include costs for other phases or for City staff time that occurs during the construction phase. It is typical to apply a contingency to the cost estimate commensurate with the level of confidence in the design. As a design progresses, the contingency factor decreases. The descriptions at these North Reach potential restoration sites are highly conceptual at this stage and have not been vetted by a feasibility analysis.

¹ See 2/27/09 Memorandum from Sallie Edmunds, Bureau of Planning and Sustainability to Planning Commissioners, "River Plan / North Reach Acquisition and Restoration Cost Estimates."

A high contingency of 75% was applied to reflect this early stage of project development.²

To estimate the costs for the remaining project phases (predesign, design, construction oversight, maintenance and monitoring), we compiled and compared life budgets from information readily available on seven BES restoration projects. We calculated the cost of these remaining phases as a percentage of the construction contract and initial revegetation work. This calculation produced a multiplier to be used to estimate restoration costs.

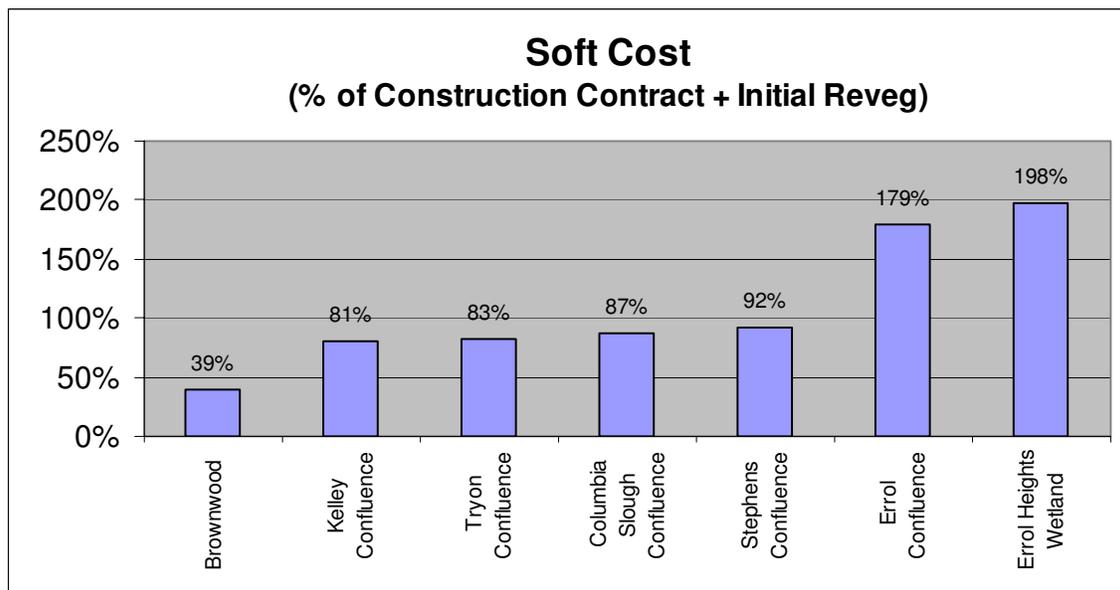
In the North Reach Plan cost estimates developed thus far, this multiplier has been called a “Management Fee,” although it encompasses much more than project management such as design, maintenance, and monitoring. As this may be a source of confusion in the future, we recommend changing the name to a more industry standard term, Soft Cost. This is a construction industry term for expenses not considered direct construction costs. Such costs include architectural, engineering, surveying, testing, permitting, and other pre- and post-construction expenses. The Soft Costs for the BES projects reviewed ranged from 39% to 198% of the sum of the costs for the construction contract and the first year of revegetation work.

The tables below provide more detailed information about the life budgets for the seven projects by project phase. In some cases updated budget information was used to construct the tables below.³

The bar graph below (“Soft Costs”) shows the soft costs for the seven BES projects reviewed. The bars represent soft costs as a percentage of the construction contract including initial revegetation.

² Amendment No. 1 to the Implementation Procedures for Capital Projects, Amendment 1, August 2006, Bureau of Environmental Services, “Project Estimate Confidence Level Rating Index Defined.”

³ See: 4/9/09 Memorandum to Sallie Edmunds, Bureau of Planning and Sustainability from Paul Ketcham and Kristen Acock, Bureau of Environmental Services, “Restoration Site Cost Estimates: North Reach Plan.”



Soft Costs calculations for the seven projects:

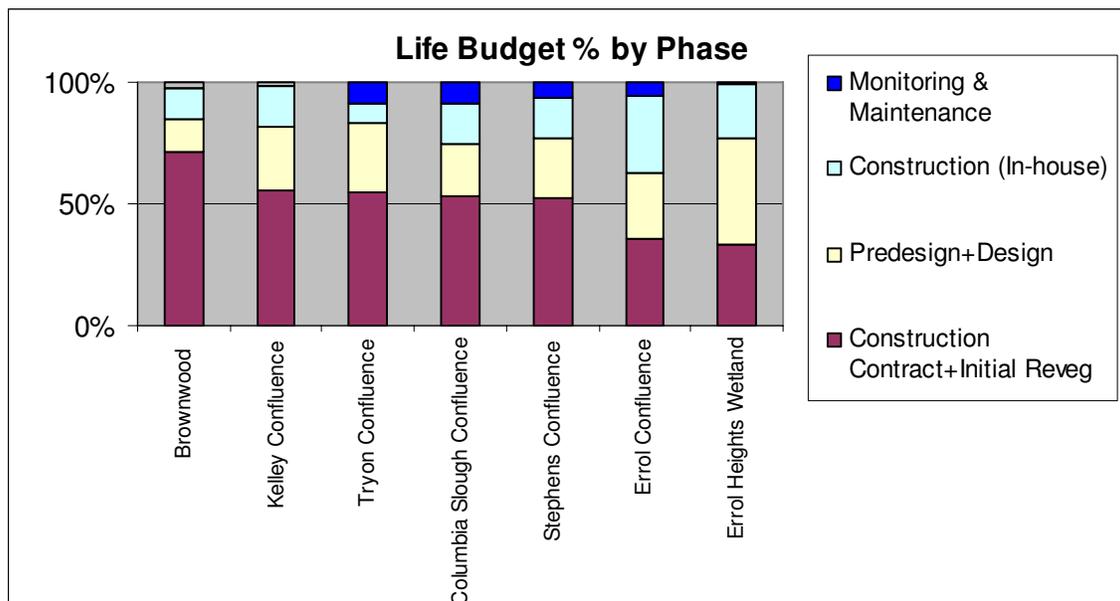
- Average of all seven projects: 108%
- Average without highest and lowest: 104%
- Average without 2 highest and 1 lowest: 86%
- Without the 1 high and 1 low: 104%

Recommendation: continue to use 90% Soft Cost multiplier in estimating restoration costs in the North Reach Plan

We are using this methodology to assist North Reach Plan staff in quickly developing cost estimates for numerous sites without detailed information. In conclusion, we recommend continuing to use a Soft Cost of approximately 90% of the construction cost with contingency to the cost estimates developed. This assumes the City is overseeing all phases of work from predesign through monitoring.

Additional Information on Project Costs

The bar graph below (“Life Budget % by Phase”) compares the proportion of the life budget spent by phase for the seven BES projects reviewed. This provides another way of looking at “soft costs” as a proportion of the total life budget. For example, the four confluence projects Kelly, Tyron, Columbia Slough, and Stephens are good examples of the kind of restoration work to be undertaken in the North Reach.



Definitions of project descriptions:

- Construction contract – amount paid to contractor to construct projects per plans/specs.
- Initial Reveg (w/o maintenance): First year of revegetation; typically includes invasives and planting work. This is done by the BES Revegetation group on our projects. (this is why it is listed separate from the contractor’s payment. Other jurisdictions would include reveg as part of the contractor’s work.)
- Pre-design & Design – including but not limited to staff time, consultant in some cases, survey, testing, permitting, archaeological investigations, public involvement, advertising, bidding
- Construction (in-house) – costs during construction phase other than construction contract amount. Including but not limited to staff time and/or consultant time for inspection, construction contract management, response to contractors’ requests for information, review of contractor submittals, public involvement, survey staking
- Monitoring & Maintenance budget: we assumed a minimum 3% of construction contract for this category. Many projects have more. Effectiveness monitoring should be based on objectives of project: could include gages, testing, survey, and staff time for fish counts, sampling, sedimentation, photo monitoring, bird counts, macroinvertebrates, and vegetation. Adaptive maintenance should be employed. Natural systems are dynamic.



CITY OF PORTLAND ENVIRONMENTAL SERVICES



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Soft Cost Project Comparison Table

Project Name	Construction Contract + Initial Reveg	Predesign + Design	Construction (in house)	Monitoring & Maintenance (min. 3%)	Life Cost	Soft Cost (% of Construction Contract + Initial Reveg)
Brownwood	\$ 4,151,110	\$ 771,777	\$ 738,666	\$ 119,583	\$ 5,781,136	39%
Kelley Confluence	\$ 699,604	\$ 336,584	\$ 209,876	\$ 19,458	\$ 1,265,522	81%
Tryon Confluence	\$ 614,000	\$ 317,851	\$ 92,000	\$ 98,000	\$ 1,121,851	83%
Columbia Slough Confluence	\$ 293,000	\$ 113,610	\$ 94,558	\$ 45,776	\$ 546,944	87%
Stephens Confluence	\$ 504,000	\$ 240,298	\$ 164,475	\$ 60,500	\$ 969,273	92%
Errol Confluence	\$ 239,000	\$ 178,865	\$ 214,121	\$ 34,798	\$ 666,784	179%
Errol Heights Wetland	\$ 41,319	\$ 53,343	\$ 27,700	\$ 680	\$ 123,042	198%



THE RIVER PLAN
NORTH REACH

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