Luther Burbank Park
Appendix
April 2006

The Berger Partnership PS
Landscape Architecture

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In preparing the Luther Burbank Master Plan and Report, a thorough inventory and analysis of the park's existing conditions was completed. As the design was developed, key issues that will affect further projects in the park were identified. This appendix is a compilation of much of that information, and provides detail regarding how the master plan was shaped and guidance for future decision-making about the park.

The inventory and analysis phase included review of the following existing reports and data from the Mercer Island archives:

- The 1972 Luther Burbank Master Plan Report (By JGM)
- The 1991 Luther Burbank Erosion Control Study (By Parametrix)
- The Spring/Summer 2000 Luther Burbank Play Area Assessment Study (By SVR)
- The February 2002 Luther Burbank Park Waterfront Evaluation (By Reid Middleton)
- The 2004 City Of Mercer Island Open Space Vegetation Plan

In addition to this historical data, the master plan effort documented the following reports (included in this appendix):

- Draft Shoreline Habitat Inventory Memorandum
- Luther Burbank Park Wetland Reconnaissance (memorandum and map)
- Draft Luther Burbank Park Permitting Process (memorandum)
- Luther Burbank Master Plan, Civil Narrative
- Luther Burbank Park, Shoreline Access and Restoration, Description of Prototypes
- Draft Phasing Strategy

The later three reports document considerations that have both shaped the master plan and will also shape the implementation the master plan in the future. It is important to note that the reports have not been updated to reflect all components of the final master plan, but are a "snapshot in time" during the design process.

The Berger Partnership and sub consultants have prepared all documents used as part of this process and included in this appendix.

Sub consultants:

ANCHOR ENVIRONMENTAL, L.L.C.

MAGNUSSON KLEMENCIC ASSOCIATES

In conjunction with:

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End of Report

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DRAFT Technical Memorandum

To: Guy Michaelson – The Berger Partnership

From: Ali Wick and Peter Hummel - Anchor Environmental, L.L.C.

Date: October 12, 2005

Re: Draft Shoreline Habitat Inventory Memorandum

Anchor Environmental, L.L.C. and The Berger Partnership are assisting the City of Mercer Island in Master Planning activities for Luther Burbank Park in Mercer Island, Washington. In the past, shoreline conditions have been evaluated for the purpose of visioning park improvements (Reid Middleton 2002) and addressing shoreline erosion (Parametrix 1991). However, the park's shoreline has not been evaluated relative to its habitat value. Thus, Anchor performed this shoreline habitat inventory to characterize existing shoreline conditions for an array of fish and wildlife, including juvenile and adult salmon, bald eagles, birds, and amphibians. In addition, this inventory presents an overview of restoration and conservation opportunities for the park, considering the feasibility of implementing the actions that could be applied to increase the habitat value of the park's shoreline.

INVENTORY AND RESULTS

To assess shoreline habitat conditions at the park, Anchor conducted a field site visit on September 29, 2005 to evaluate the park's approximately 4,280 lineal feet of shoreline (Figure 1). The shoreline of the park was divided into homogeneous shoreline segments ("reaches"), and conditions were identified based on key nearshore habitat parameters relevant to salmon and other species (Figure 1). Conditions were evaluated waterward between the ordinary low water (OLW) and ordinary high water (OHW) lines, and upland within 50 feet of the shoreline. Location data for the beginning and end of each reach were collected using a Differential Global Positioning System (DGPS). Data collected included physical habitat characteristics indicative of the natural shoreline habitat that would be present for fish and wildlife in this area (Table 1).

Shoreline conditions at Luther Burbank Park varied widely in almost all of the categories characterized in this inventory (Table 2). Conditions ranged from severe to little erosion, from

heavy vegetation to little or no vegetation, and from substrates of clay to cobble and boulder. Large woody debris (LWD) presence is limited along the shoreline, except where anchored wood exists in one short segment, and where several downed and standing poplar trees provide a source (Reaches 11-15).

Additional notable shoreline conditions include several small erosion pockets with sand/gravel substrate that are being created as a result of severe shoreline erosion on the eastern park shoreline in the areas south of the dog off-leash area (Reach 11) , as well as in the reaches between the two docks (Reach 18; Photo 1). In some of these pocket erosion areas, the mulch from the walking trail is sloughing down the slope, onto the shoreline, and into the water. Shoreline structures include two dock complexes which extend approximately 235 feet and 130 feet waterward from the shoreline (Reach 16, Reach 19), and six visible outfalls which range from approximately 3 to 8 inches in diameter. These outfalls were dry during the site visit, except where submerged.

Photo 1. Erosion pockets; trail mulch extending into water.

Though no studies have investigated shore drift at the park, previous research and observations made during the field visit suggest that shore drift at the park may shift seasonally and depend on shoreline exposure to wind and wave action. An earlier study examining shoreline erosion at the park concluded that waves from both wind and power boats contribute to erosion at the park, but that erosion is most severe at the northeastern shoreline (Calkins Point area) because of its exposure to refracted waves from both the east and west (Parametrix 1991)[1]. The erosion report also indicated that wave direction varies seasonally, with winds originating in the winter/spring from the south/southwest and in the summer/early fall from the north/northwest; winds average 15 mph with a typical maximum of 40 mph during winter storms (Parametrix 1991). Fetch distances range from a maximum of approximately 3.5 miles to the

[1] Calkins Point is approximately 3.5 miles from the Evergreen Point Floating Bridge (SR 520) and the park's eastern shoreline is approximately 0.7 miles from the mainland.

north/northwest ending at the 520 Bridge, to 1 to 1.5 miles to the southeast at the I-90 east channel bridge. Calkins Point is exposed to the longest fetch distances in either direction. During the course of this shoreline habitat inventory, it was noted that along the eastern shoreline south of the dog off-leash area, there were several scattered boulder piles with visible, but minor, sediment accumulations on the south side of the rocks (Reach 11; Photo 2); at this time, a strong southerly wind was blowing, and wave heights were approximately 0.5 feet.

Photo 2. Example of scattered boulders with minor sediment accumulation

CONCLUSIONS

Based on inventory results for reach condition, habitat restoration or conservation opportunities for each reach were identified, depending on whether the reach is more appropriate for restoration or conservation activity (Table 3). The relative priority of restoring or conserving each reach was then evaluated with respect to Capability (whether the habitat would be likely to be able to sustain the restored or conserved state without continued active management) and Feasibility (whether the existing habitat quality high enough to consider conserving this habitat rather than restoring it). Capability was assigned a value of Yes or No, and Feasibility was assigned 'Yes', 'No', or 'Yes, with design' (meaning constraints to feasibility could likely be overcome using relevant and practical design considerations for the reach), and Priority was assigned a value of High, Medium, Low, or None (Table 4). Generally, 'Yes, with design' values were considered slightly less valuable than 'Yes' values because of the additional monetary cost that would be incurred with the necessary design or construction considerations.

High Priority Restoration Reaches

Reaches 11-15, 18, 20, and 21 ranked as high priority for habitat restoration. In these reaches, the only use constraints are shoreline trail access and view corridors, and habitat benefits could be gained along continuous stretches of shoreline. In Reaches 11-15, major

problems to be addressed include erosion and poor substrate; the erosion here is moderate to severe, and the substrate is either clay hardpan or relatively large in places. The shoreline could be graded and/or beach nourishment substrate could be added to provide appropriate substrate. Key issues in Reach 18 include erosion pockets that have formed due to erosion, and mulch that is sloughing into the water. Reaches 20 and 21 have moderate shoreline erosion problems. In all of these high priority reaches, native vegetation is sparse or lacking and non-native vegetation is pervasive. To address this, non-native vegetation could be removed and existing vegetation could be supplemented with native plantings.

High Priority Conservation Reaches

Reaches with a high priority for conservation included Reaches 1, 2, and 23, which are in/adjacent to freshwater inputs with slightly modified but mostly intact wetlands.

As a final note, the context of reaches with respect to one another should be considered during the Master Planning decision-making process. It should be noted that the value of high priority restoration and conservation reaches would be slightly increased based on proximity to nearby high quality habitat areas. For example, although Reach 3 ranks as a low priority for restoration, it could be considered a high end of the low priority ranking because it is adjacent to higher quality habitat.

REFERENCES

Parametrix. 1991. Luther Burbank Erosion Control Study – Final Report and Recommendations. Prepared for King County Parks Division in association with TAMS Consultants, Inc., and Rittenhouse-Zeman & Associates. October 1991.

Reid Middleton. 2002. Luther Burbank Park – Waterfront Evaluation. Prepared for City of Mercer Island. February 2002.

TABLES AND FIGURES

Table 1
Shoreline Reach Data Collected

Habitat Parameter	Characteristic
Approximate Slope	Vertical, >5:1 OLW-OHW, <5:1 OLW, >5:1 OHW, <5:1 OLW-OHW
Armoring	None or Type (Riprap, Debris, Stacked Concrete, Vertical Concrete, Anchored Logs, Vertical Wood, Sheetpile, Other)
Approximate Toe Depth below OLW	(in feet)
Erosion[1]	None or Low, Moderate (<1-2' erosive height difference in water depth and shoreline), or Severe (>2-3' erosive height difference in water depth and shoreline)
Armor Notes	(qualitative)
Substrate (Primary and Secondary)	Type (Silt or Clay, Sand, Small Gravel (0.1-0.5" in diameter), Medium Gravel (0.6-1.5" in diameter), Large Gravel (1.6-3" in diameter), Cobble (6-12" in diameter), Boulder (>12" in diameter), Bedrock, Other
Substrate Notes	(qualitative)
Vegetation – approximate percent overhanging OHW	(Percent)
Vegetation Type	Type (Native, Non-Native, Invasive, Other [mixed])
Vegetation Notes	(list dominant plants)
LWD	Count of pieces below OLW, at OLW, above OLW
LWD Notes	(qualitative)
Reach Notes	(qualitative)
Photos	(numbered)
Docks and Piers	Length Waterward at OLW (in feet)
	Approximate Width at OLW (in feet)
	Number of slips
	Use type (day, marina, other)
	Dock Notes
Freshwater Inputs	Input characteristics (approximate diameter, angle, drop)
	Notes
	Adjacent outfall? (True/False)

[1] Erosion types applied from Parametrix (1991).

Table 2
Shoreline Reach Data Summary

Reach	Approximate Slope	Armoring	Approximate Armor Depth (in feet)	Erosion	Armor Notes	Primary Substrate	Secondary Substrate	Substrate Notes	Approximate Overhanging Vegetation Percent	Vegetation Type	Vegetation Notes (dominant vegetation)	LWD below OLW	LWD at OLW
1	<5:1OLW>5:1OHW	None	0	None or Low	some placed logs and riprap at start of reach	Sand	Large Gravel 1.5-3		20	Other (mixed)	shrubs	0	4
2	<5:1OLW-OHW	None	0	None or Low		Sand	Large Gravel 1.5-3		90	Native	willow	0	0
3	Vertical	None	0	Severe	single cement block present in water	Med Gravel 0.5-1.5	Silt or Clay		50	Native	hawthorn	0	0
4	<5:1OLW>5:1OHW	None	0	Severe	boulders	Sand	Small Gravel 0.1-0.5		0	Other (mixed)	turfgrass	0	0
5	Vertical	None	0	Severe	short bluffs	Silt or Clay	Large Gravel 1.5-3	some concrete blocks at end of reach	0	Other (mixed)	turfgrass	0	0
6	Vertical	None	0	Severe	short bluffs	Silt or Clay	Large Gravel 1.5-3		70	Native	hawthorn	0	0
7	Vertical	None	0	Moderate/Severe	short bluffs	Silt or Clay	cobble 6-12	clay offshore, sand inshore	90	Native	trees	0	0
8	<5:1OLW>5:1OHW	None	0	None or Low/Moderate		Sand	Large Gravel 1.5-3		50	Native	large trees and *Carex*	1	0
9	<5:1OLW>5:1OHW	None	0	None or Low/Moderate		Sand	Small Gravel 0.1-0.5	some med gravel offshore	20	Other (mixed)	large trees - also some willow and elderberry	0	0
10	<5:1OLW>5:1OHW	Riprap	0	None or Low/Moderate	riprap and wood steps ~20 feet long	Sand	Small Gravel 0.1-0.5	some med gravel offshore	0	Other (mixed)	none - this area is mulched	0	0
11	<5:1OLW>5:1OHW	None	0	Severe	some boulders and med gravel and cobble offshore	Sand	Med Gravel 0.5-1.5		30	Other (mixed)	some conifers, blackberry, horse chestnut, and downed live poplars	0	0
12	<5:1OLW>5:1OHW	None	0	Severe	some boulders and med gravel and cobble offshore	Med Gravel 0.5-1.5	Large Gravel 1.5-3	some clay hardpan offshore	75	Other (mixed)	large trees	0	0
13	<5:1OLW>5:1OHW	None	0	Moderate	some boulders and med gravel and cobble offshore	Med Gravel 0.5-1.5	Large Gravel 1.5-3	some clay hardpan offshore	10	Other (mixed)	poplars, turfgrass, blackberries, and downed live poplar	2	0
14	<5:1OLW>5:1OHW	None	0	Moderate	some boulders and med gravel and cobble offshore	Med Gravel 0.5-1.5	Large Gravel 1.5-3	some clay hardpan offshore	30	Other (mixed)	poplars, turfgrass, and blackberries	0	0
15	<5:1OLW>5:1OHW	None	0	Moderate	some boulders and med gravel and cobble offshore	Sand	Med Gravel 0.5-1.5	some clay hardpan offshore	10	Other (mixed)	poplars, turfgrass, and blackberries	0	0
16	Vertical	Vert. Concrete	3	Severe	seawall adjacent building	Boulder >12	Cobble 6-12		0	None	none - this area is mulched	0	0
17	<5:1OLW>5:1OHW	Riprap	0	Severe	some conc debris and anchored logs and failing riprap	Sand	Cobble 6-12	conc debris	40	Other (mixed)	blackberries, large trees	0	0
18	<5:1OLW>5:1OHW	None	0	Moderate		Med Gravel 0.5-1.5	Large Gravel 1.5-3	boulders offshore some sandy pockets	90	Other (mixed)	large decid trees, shrubs; English ivy, blackberries, and lots of holly	3	0
19	Vertical	Anchored Logs	0	Severe	logs above/at OHW	Large Gravel 1.5-3	Silt or Clay	clay hardpan offshore, quarry spall at start of reach	10	Other (mixed)	large decid trees, shrubs; English ivy, blackberries, and lots of holly	0	0
20	<5:1OLW>5:1OHW	None	0	Moderate		Large Gravel 1.5-3	Med Gravel 0.5-1.5	sand	80	Other (mixed)	large decid trees, shrubs; English ivy, blackberries, and lots of holly	0	0
21	<5:1OLW>5:1OHW	None	0	Moderate	short bluffs	Large Gravel 1.5-3	Med Gravel 0.5-1.5	sand and some boulders and concrete blocks offshore	0	No-Native	turfgrass, blackberries	0	0
22	<5:1OLW-OHW	None	0	None or Low	short swim beach seawalls present above OHW	Sand	Silt or Clay	med gravel at start of reach	0	No-Native	turfgrass	0	0
23	<5:1OLW>5:1OHW	None	0	None or Low		Sand	Small Gravel 0.1-0.5		60	Native	emergent marsh vegetation and some large trees	0	0

Table 2
Shoreline Reach Data Summary

Reach	LWD above OLW	LWD Notes	Reach Notes	Dock Present?	Dock Length Waterward	Approximate Dock Width at OLW	No. of dock slips	Use Type	Dock Notes	Freshwater Input?	F/W Input diameter	F/W Input Angle	F/W Input Drop	Adjacent Outfalls?	F/W Input Notes	Reach Length (in feet)
1	0	placed lwd	woody debris and soil pile, old beaver dam? evidence of beaver cuts on debris	No						No						166
2	0			No						No						151
3	0			No						No						74
4	0		homogenous pebble rock; boulders forming small jetty-like structure at point	No						No						115
5	0			No						No						44
6	0			No						No						96
7	0			No						No						158
8	0			No						Yes	5	5	0	No	dry	208
9	1			No						Yes	5	10	0	No		146
10	1		erosion severe except where riprap exists	No						No						95
11	2		some pocket beaches	No						No						506
12	0			No						No						215
13	0			No						No						155
14	0			No						Yes	3	Not visible	Not visible	No	catch basin	126
15	2			No						No						150
16	0			Yes	235	8		Day Use	some derelict	Yes, 2	3,8	5,5	0,0	Yes, Yes	dry, dry	224
17	0		riprap and wood steps ~20 feet long	No						Yes	8	5	0	No	submerged	80
18	0		some pocket beaches created by erosion	No						No						536
19	0			Yes	132	8		Day Use		No						49
20	0			No						No						118
21	2			No						No						187
22	0		swim beach; slope steeper than <5:1 at start of reach	No						No						118
23	10	scattered pieces		No						No						561

Table 3
Shoreline Habitat Summary and Restoration Opportunities

Reach	**Reach Condition** (summary)	**Habitat Improvement Restoration Opportunities** (what could change to benefit habitat?)	**Reach-Appropriate Measure** (Restoration or Conservation)	**Capability** (is the habitat likely to be able to sustain the restored or conserved state without continued active management (Y/N)?)	**Feasibility** (is the existing habitat quality high enough to consider conserving this habitat rather than restoring it?)	**Conservation or Restoration Priority** (Low, Med, High, None)	**Justification and Restoration Recommendations**
1	Moderate steep slope, no armoring, sm/lg substrate, mixed native/non-native veg w/ little cover	None	C	Yes - habitat is intact wetland	Yes	High	Reaches 1-2 are in/adjacent to a freshwater input with a modified but mostly intact wetland. Conservation is recommended.
2	Gentle slope, no armoring, sm/lg substrate, native veg with high cover	None	C	Yes - habitat is intact wetland	Yes	High	
3	Vertical slope (2-3'), no armoring, med and scoured (hardpan exposed) substrate, native veg w/ med cover	Beach nourishment (sand/gravel), plant natives to increase overhanging vegetation	R	No - shoreline would likely require periodic renourishment	Yes, but constraints could be overcome with design (lake views)	Low	Reaches 3-7 are near an existing stream/wetland but have low cut-banks from erosion. Most of these reaches have a clay hardpan substrate and would require beach nourishment to provide a new and adequate substrate, but grading would not be recommended because there is little existing shoreline vegetation to stabilize the bank. Park uses for lake viewing limit the potential to restore vegetation here, and exposure to continued erosion would need to be addressed in light of any restoration action.
4	Moderate steep slope, no armoring, sm substrate, mixed veg w/ no cover	Beach nourishment (sand/gravel), plant natives to increase overhanging vegetation	R	No - shoreline would require periodic renourishment due to erosive forces	Yes, but constraints could be overcome with design (lake views)	Low	
5	Vertical slope (2-3'), no armoring, scoured (hardpan exposed) and med substrate, native veg w/ no cover	Beach nourishment (sand/gravel), plant natives to increase overhanging vegetation	R	No - shoreline would require periodic renourishment due to erosive forces	Yes, but constraints could be overcome with design (lake views)	Low	
6	Vertical slope (2-3'), no armoring, scoured (hardpan exposed) and med substrate, native veg w/ med cover	Beach nourishment (sand/gravel), plant natives to increase overhanging vegetation	R	No - shoreline would require periodic renourishment due to erosive forces	Yes, but constraints could be overcome with design (lake views)	Low	
7	Vertical slope (1-3'), no armoring, scoured (hardpan exposed) and med substrate, native veg w/ high cover	Beach nourishment (sand/gravel), plant natives to increase overhanging vegetation	R	No - shoreline would require periodic renourishment due to erosive forces	Yes, but constraints could be overcome with design (lake views)	Low	
8	Moderate steep slope, no armoring, sm/lg substrate, native veg w/ med cover	Beach nourishment (sand/gravel), plant natives where possible to increase overhanging vegetation - outfall present ~5" diam.	R	No - erosion would still be moderate and heavy foot traffic would affect substrate stability	Yes, but constraints could be overcome with design (partly in dog off-leash area, also shoreline access)	Low	Reaches 8, 9, and 10 are part of dog-off leash area as well as experience heavy erosion (Reach 8 is partly out of the area). In the northern area, the vegetation cover is moderate and mostly native; reach 10 is barren and mulched. Substrate restoration in parts of this area would be valuable to increase value of adjacent habitats near wetland at north end of park, balanced with dog-off leash uses (shoreline access and viewpoints). Although habitat restoration of Reach 10 conflicts with the dog off-leash use, some stabilizing measures could be completed which would increase the habitat value of this area and also provide for shoreline use and access (terrace/grade slope, remove armor, add sand/gravel).
9	Moderate steep slope, no armoring, sm substrate, mixed veg w/ low cover	Terrace or grade, plant natives where possible to increase overhanging vegetation - outfall present, ~5" diam.	R	No - erosion would still be moderate and heavy foot traffic would affect substrate stability	Yes, but constraints could be overcome with design (dog off leash area and shoreline access)	Low	
10	Moderate steep slope, riprap armor, sm substrate, no vegetation, mulch	Terrace or grade slope, remove armor, increase native veg cover where possible, replace mulch with plantings and sand/gravel where possible	R	No - erosion would still be moderate and heavy foot traffic would affect substrate stability	No - restoration conflicts with dog-park use. However, see Justification column at right.	None	
11	Moderate steep slope, no armoring, sm/med substrate, mixed veg w/ some cover	Beach nourishment (sand/gravel), plant natives to increase overhanging vegetation	R	Yes - placed substrate and existing/new vegetation would likely be sustainable	Yes, but constraints could be overcome with design (shoreline trail and views)	High	Reaches 11-15 represent areas where the only use constraints are access and view corridors, and much habitat could be gained along a continuous stretches of shoreline. Erosion is mostly moderate, and the substrate is either clay hardpan or relatively large in places, and (with exception of Reach 12), shoreline vegetation is sparse and heavy on non-natives. Shoreline could be graded and beach nourishment could provide appropriate substrate in these areas; existing vegetation could be supplemented with natives. The end of Reach 15 abuts the historic boiler building and bulkhead, so restoration would have to be integrated into existing uses here.
12	Moderate steep slope, no armoring, lg substrate, mixed veg w/ high cover	Beach nourishment (sand/gravel), plant natives to increase overhanging vegetation	R	Yes - placed substrate and existing/new vegetation would likely be sustainable	Yes, but constraints could be overcome with design (shoreline trail and views)	High	
13	Moderate steep slope, no armoring, lg substrate, mixed native/non-native veg w/ little cover	Beach nourishment (sand/gravel), plant natives to increase overhanging vegetation	R	Yes - placed substrate and existing/new vegetation would likely be sustainable	Yes, but constraints could be overcome with design (shoreline trail and views)	High	
14	Moderate steep slope, no armoring, lg substrate, mixed native/non-native veg w/ little cover	Beach nourishment (sand/gravel), plant natives to increase overhanging vegetation - catch basin present	R	Yes - placed substrate and existing/new vegetation would likely be sustainable	Yes, but constraints could be overcome with design (shoreline trail and views)	High	
15	Moderate steep slope, no armoring, sm substrate, mixed native/non-native veg w/ little cover	Beach nourishment (sand/gravel), plant natives to increase overhanging vegetation	R	Yes - placed substrate and existing/new vegetation would likely be sustainable	Yes, but constraints could be overcome with design (shoreline trail, shoreline access, and views)	High	

Table 3
Shoreline Habitat Summary and Restoration Opportunities

Reach	**Reach Condition** (summary)	**Habitat Improvement Restoration Opportunities** (what could change to benefit habitat?)	**Reach-Appropriate Measure** (Restoration or Conservation)	**Capability** (is the habitat likely to be able to sustain the restored or conserved state without continued active management (Y/N)?)	**Feasibility** (is the existing habitat quality high enough to consider conserving this habitat rather than restoring it?)	**Conservation or Restoration Priority** (Low, Med, High, None)	**Justification and Restoration Recommendations**
16	Vertical concrete bulkhead (water depth at bulkhead toe = 3'), dock, and boiler building, sm/med substrate, no vegetation	Remove bulkhead and dock, grade slope, plant natives to increase overhanging vegetation - 2 outfalls present, ~3" and ~8" diam.	R	No - distance between building and beach would be too short for unarmored habitat.	No - removal of historick building, bulkhead, and dock not feasible	None	Reaches 16 and 17 represent highly modified shorelines around the historic boiler building. It is assumed that the removal of this building, bulkhead and functioning dock would not be feasible and would preclude restoration actions in these reaches. However, actions could be taken to increase habitat value in nearby reaches.
17	Moderate steep slope, riprap armor, mixed substrate, concrete debris, mixed veg w/some cover	Grade slope, remove armor and debris, plant natives to increase overhanging vegetation - outfall present, ~8" diam.	R	No - distance between building and beach would be too short for unarmored habitat.	No - removal of historick building, bulkhead, and dock not feasible	None	
18	Moderate steep slope, no armor, med/lg substrate, mixed veg w/ high invasive cover	Beach nourishment (sand/gravel), plant natives to increase overhanging vegetation	R	Yes - placed substrate and existing/new vegetation would likely be sustainable	Yes	High	Reach 18's shoreline has shoreline erosion problems with varying severity; pocket beaches have formed due to erosion and mulch is sloughing into the water. Like Reaches 11-15, this reach is an area where the only use constraints here are access and view corridors, and much habitat benefit could be gained along a continuous stretch of uninterrupted shoreline.
19	Vertical anchored-log bulkhead and dock (2-3'), mixed native/non-native veg with large substrate and clay hardpan offshore	Remove bulkhead and dock, fill or grade slope, remove invasives, plant natives to increase cover	R	Yes - placed substrate and existing/new vegetation would likely be sustainable	No - removal of bulkhead and dock not feasible	None	It is assumed that the removal of Reach 19's bulkhead and dock is not feasible and would preclude restoration actions here.
20	Moderate steep slope, no armor, lg/med substrate, mixed veg w/ high invasive cover	Beach nourishment (sand/gravel), remove invasives, plant natives to increase overhanging vegetation	R	Yes - placed substrate and existing/new vegetation would likely be sustainable	Yes	High	Reaches 20 and 21 are similar to Reach 18 in representing areas where the only access constraints are view corridors.
21	Moderate steep slope, no armor, lg/med substrate, mixed veg w/ no cover	Beach nourishment (sand/gravel), remove invasives, plant natives to increase overhanging vegetation	R	Yes - placed substrate and existing/new vegetation would likely be sustainable	Yes	High	
22	Swim beach; gentle slope, no armor below OLW, sm and scoured (hardpan exposed) substrate, no veg cover	Beach nourishment (sand/gravel), remove invasives, plant natives to increase overhanging vegetation	R	No - erosion would still be moderate and heavy user traffic would affect substrate stability	Yes - but constraints could be overcome with design (swim beach)	Low	Swim beach in Reach 22 receives high use and requires access and view corridors. It is assumed that this use precludes vegetation restoration actions here; however, substrate renourishment would provide some habitat benefit for nearshore fish species.
23	Moderate steep slope, no armor, small substrate, native veg w/ med/high cover	None	C	Yes - habitat is intact wetland	Yes	High	Reach 23 is in/adjacent to a freshwater input with a modified but mostly intact wetland complex. Conservation is recommended.

Table 4
Decision Process for Restoration and Conservation Priorities

Restoration			Conservation		
Capability (Y or N)	**Feasibility (Y, N, or Y w/design)**	**Priority (High, Med, Low, or None)**	**Capability (Y or N)**	**Feasibility (Y, N, or Y w/design)**	**Priority [1] (High, Med, Low, or None)**
Y +	Y =	High	Y +	Y =	High
Y +	Y w/design =	High	Y +	N =	None
N +	Y =	Med	N +	N =	None
N +	Y w/design =	Low			
Y +	N =	None			
N +	N =	None			

1 Not all of the combinations of the table values existed or made sense. For restoration, the last two combinations for restoration would be non-starter projects. Also, the combination of N (Capability) and Y (Feasibility) did not exist at the park. For conservation, the combination of N (Capability) and Y (Feasibility) does not make sense; if the habitat is not capable of sustaining a conserved state, then it would not be under consideration for conservation. Also, design would not be a consideration if reaches were to be conserved because construction and design would not be necessary.

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ANCHOR ENVIRONMENTAL, L.L.C.

0 75 150 300
Scale in Feet

Figure 1
Shoreline Habitat Reaches
Luther Burbank Park Shoreline Habitat Inventory

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Memorandum

To: Guy Michaelsen, The Berger Partnership P.S.

From: Calvin Douglas and John Small, Anchor Environmental, L.L.C.

Date: October 10, 2005

Re: Luther Burbank Park Wetland Reconnaissance Map
Mercer Island, Washington

The City of Mercer Island (the City) is developing a Master Plan for Luther Burbank Park. Anchor Environmental, L.L.C. (Anchor) is performing a variety of tasks in support of the City's Master Plan preparation. This memorandum describes the methods used during an on-site wetland and stream reconnaissance and development of a map identifying approximate wetland habitat and stream boundaries within Luther Burbank Park (Attachment A). This work has been conducted in accordance with Anchor's proposal to the City dated August 30, 2005.

The area investigated during the wetland reconnaissance included two parcels of City park property in Luther Burbank Park: one parcel north of Interstate 90 (I-90), and an approximately 18-acre forested parcel located south of I-90 (see Attachment A).

METHODS

Prior to performing the wetland reconnaissance, Anchor ecologists reviewed topographic maps and color aerial photography of the property. In addition, the City's Environmentally Critical Areas (ECA) Ordinance for wetlands and shorelines was reviewed (Mercer Island 2005).

To assess wetland and hydrologic conditions, Anchor ecologists visited the City park property on September 30, 2005, to perform a reconnaissance-level inspection to evaluate sensitive areas. The majority of Luther Burbank Park was accessible during the site visit by walking the variety of trails and roads located within the Park. Access within the forested parcel south of I-90 was limited due to dense vegetation and steep slopes associated with ravines.

Wetland conditions were identified based on observed plant communities and hydrologic conditions. Wetland delineations or surveys were not performed as part of this analysis. The general locations and approximate boundaries of all potential wetland habitat observed during the site visit were located using a differential global positioning system (DGPS), for subsequent transfer to an AutoCAD topographic survey map (Attachment A). Potential wetland classifications and buffer widths were identified based on observations during the wetland reconnaissance. The City's ECA Ordinance does not identify wetland rating and buffer width criteria. According to the City's Planning Department (Salzman 2005), wetland ratings are determined using the Washington State Department of Ecology (Ecology) *Washington State Wetland Rating System – Western Washington* (2004) and buffer widths are determined using Ecology's *Guidance for Protecting and Managing Wetlands* (2005). This guidance provides three options for determining wetland buffer widths: buffer widths based on land use and wetland function scores, buffer widths based on land use, and buffer widths without incorporating land use or functions information. For this analysis, buffer widths were based on land use criteria. Approximate potential wetland boundaries, wetland ratings, and wetland buffers are presented on the map in Attachment A.

Because no on-site surveys or delineations of potential wetlands were conducted, further field investigations would be necessary to confirm the presence, absence, boundaries, functions, and values of wetland systems within the City park property. To confirm wetland boundaries, wetland delineations should be conducted according to the methods defined in the 1987 *U.S. Army Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) and the 1997 *Washington State Wetland Identification and Delineation Manual* (Ecology 1997).

In addition to the wetland habitat analysis, drainages in the forested parcel south of I-90 were evaluated to identify stream classifications according to the Washington State stream typing system, as defined in Chapter 222-16-030 of the Washington Administrative Code (WAC 2005). Stream habitat characteristics assessed during the reconnaissance included potential fish usage, hydrologic functions, channel bed and bank conditions, substrate composition, and riparian vegetation. Approximate stream channel boundaries and classifications are presented on the map in Attachment A.

REFERENCES

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ANCHOR ENVIRONMENTAL, L.L.C.

0 100 200 300 400
Scale in Feet

Notes:
Potential wetland habitat conditions were evaluated based on a reconnaissance-level site visit performed on September 30, 2005. Wetland delineations or surveys were not performed as part of this analysis. To confirm the presence, absence, boundaries, functions, and values of wetland systems, wetland delineations should be conducted according to the methods defined in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual and the 1997 Washington State Department of Ecology Wetland Identification and Delineation Manual.

Figure 1
Guy Michaelsen
October 5, 2005
Luther Burbank Park Wetland Reconnaissance Map Mercer Island, Washington

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Memorandum

To: Guy Michaelsen, The Berger Partnership

From: Gisele Sassen and Peter Hummel, Anchor Environmental, L.L.C.

Date: December 13, 2005

Re: Draft Luther Burbank Park Permitting Process

Anchor Environmental, L.L.C. and The Berger Partnership are assisting the City of Mercer Island (City) in Master Planning activities for Luther Burbank Park in Mercer Island, Washington. This memorandum outlines and evaluates the environmental approvals that are anticipated for future improvements at Luther Burbank Park. The full suite of aquatic-related permits would likely be necessary from local, state, and federal authorities for several elements of the anticipated work; however, all of these approvals would not be required for each of the proposed improvements. The scope of work and location of proposed activities would determine which approvals are required. The attached matrix provides a list of environmental approvals that would need to be considered for each of the proposed improvements.
The lead agency for these approvals would depend on the activity being permitted. Lead agencies for the various permits and approvals are discussed in the following sections.

PERMIT AND APPROVAL PROCESS

Federal Approvals

U.S. Army Corps of Engineers

A Section 10 permit from the Rivers and Harbor Act of 1899 would be required for dredging or placement of structures in waters of the U.S.—including wetlands—from the U.S. Army Corps of Engineers (Corps). A Section 404 approval would be required from the Corps for fill activities below the ordinary high water (OHW)[1] line of Lake Washington, in streams, and in wetlands. Section 404 pertains to the Clean Water Act and is intended to protect chemical and biological integrity of waters of the U.S. Regulated activities under Section 10/404 include such things as dredging or the placement of fill material (riprap, beach enhancement, bulkheads, etc.)

[1] At Lake Washington, the OHW line is 21.8 feet (COE), equal to 18.67 feet OHW (NAVD 88).

in water or wetlands. Depending on the nature of the proposed project, it may be possible to apply for Nationwide Permit(s) (NWPs), which are permits that cover a range of activities included under Section 10 and Section 404. For example, a NWP 3 is for routine repairs and replacement of structures, and as long as the proposed activity complies with the national and regional conditions associated with that NWP, a NWP could be issued. A Joint Aquatic Resources Permit Application (JARPA) would be used to apply for the permits. A set of design-level plans (typically 30%), including cross-sections, would need to accompany the JARPA.

For permit approvals, the Corps is required to comply with the National Environmental Policy Act (NEPA). Except for major project actions (those that require an Environmental Impact Statement), the Corps typically handles NEPA internally by preparing a memorandum for the file demonstrating how the proposed project complies with NEPA. They use NEPA regulations and information in the JARPA to complete their NEPA analysis.

National Marine Fisheries Service and U.S. Fish and Wildlife Service

The permit approval required by the Corps would provide the federal nexus that triggers the need to address Endangered Species Act (ESA) requirements. Projects that receive federal funding are also required to comply with ESA. If ESA compliance is required, a Biological Assessment (BA) that addresses the existing habitat and the effects of the project on species listed for protection under ESA and designated critical habitat would need to be prepared. The Corps would use the BA to initiate consultation under Section 7 of ESA with the National Marine Fisheries Service (NMFS) and with the U.S. Fish and Wildlife Service (USFWS). These two agencies oversee the protection of various fish and wildlife species listed under ESA and designated critical habitat; they would need to concur with the findings of the BA. The BA would include an assessment of Essential Fish Habitat, which is also required by NMFS under the Magnuson-Stevens Fishery Conservation and Management Act.

State Approvals

Washington Department of Fish and Wildlife

A Hydraulic Project Approval (HPA) would likely be required from the Washington Department of Fish and Wildlife (WDFW) for any work that uses, diverts, obstructs, or changes the natural flow or bed of state waters. The JARPA would also be used to apply for this permit.

Prior to submitting the JARPA to WDFW, a State Environmental Policy Act (SEPA) determination would need to be issued by the City (see City Approvals below).

Washington State Department of Ecology

401 Water Quality Certification

A 401 Water Quality Certification is required from the Washington State Department of Ecology (Ecology) when applying for a federal permit to conduct any activity that might result in a discharge of dredge or fill material into water or wetlands, or any excavation in water or wetlands. This approval is the state component of the Clean Water Act. The JARPA would also be submitted to Ecology for this certification. Ecology would provide input to the City for both the shoreline permit and SEPA review processes (see City Approvals below).

Coastal Zone Management Act Consistency Determination

In addition, project activities that require a federal permit or receive federal funding require a determination of consistency with the Coastal Zone Management Act (CZMA). A Coastal Zone Management Certification will be issued by Ecology for non-federal agency projects.
In the case of Luther Burbank Park, the Corps permit will likely trigger the CZMA process. If the CZMA is approved as part of a NWP, no further action will be required.

Washington Department of Natural Resources

An Aquatic Use Authorization by the Washington Department of Natural Resources would be required for a project that affects state-owned aquatic lands, including the bedlands of Lake Washington. It includes activities such as pile replacement, over-water coverage, and dredging and filling below OHW.

Local Approvals

City of Mercer Island

A SEPA review would be required for the City to formally adopt the Luther Burbank Park Master Plan. The City would act as the lead agency for SEPA review. Based on project information provided in an SEPA environmental checklist, the City would evaluate the proposal's likely environmental impacts. The City would issue a threshold determination – Determination of Non-Significance (DNS), Mitigated Determination of Non-Significance

(MDNS) or a Determination of Significance (DS). If a DS were issued for the project, an Environmental Impact Statement (EIS) would need to be prepared.

PROJECT APPROACH AND TIMING

Upon preliminary review, we do not think that the elements included in the proposed Luther Burbank Master Plan would generate probable significant adverse environmental impacts that cannot be mitigated. We would expect that a DNS/MDNS process would be appropriate for a project of this anticipated scope and nature. Continued dialogue with interested neighbors and interest groups and general public outreach efforts by the City would help reveal where the Master Plan stands with constituents and allow for incorporation of public concern into the proposed Master Plan design.

However, to clearly establish whether or not the impacts would be significant, a non-project SEPA analysis and review process is recommended to accompany the adoption of the Master Plan. This process would determine the level of impact of any given element of the proposed Master Plan. The threshold determination generated by this SEPA process will inform and help guide the future implementation strategy for the various plan elements from an environmental standpoint.

The Luther Burbank Park project will likely be constructed in phases, and it may make sense to use a phased SEPA review following the non-project SEPA checklist and review process as individual phases of the project move towards implementation. SEPA specifically addresses how to conduct a phased review (Washington Administrative Code [WAC] 197-11-060 {5}). A series of environmental checklists would be generated that address specific project-level design details for each individual phase of the project.

CRITICAL AREA ORDINANCE AND SHORELINE SUBSTANTIAL DEVELOPMENT PERMIT

Some areas of the park are designated by the City as Environmentally Critical Areas in accordance with the Growth Management Act and the SEPA. At Luther Burbank Park, there are shorelines, wetlands, streams/watercourses, and landslide prone areas. Design criteria and

permitted uses may be applicable in these areas. Review of the effects on the resources under the City Critical Areas Ordinance would be required as part of the SEPA process.

Under the Shoreline Management Act, any activity within 200 feet of a state shoreline requires a shoreline permit. The City would also be responsible for issuing the shoreline permit. Luther Burbank Park is designated as "Park Conservancy" under the shoreline management plan. The guidelines pertaining to the "Park Conservancy" designation are found in Chapter 19.07.080 of the Mercer Island City Code.

Environmental Approvals Required for the Luther Burbank Project

Approval	Jurisdiction	Items Necessary Prior to Submittal	Next Steps/ Timeframe
SEPA	City of Mercer Island	Detailed project description. Completed SEPA Checklist with figures (Vicinity Map, Site Map(s), Photos).	Submit copy to City Public meeting Total timeframe: 3 to 6 months, including public comment period and mandatory 14 day publication of SEPA threshold determination
Shoreline Substantial Development Permit	City of Mercer Island	Pre-application meeting with City staff to determine requirements for permit submittal, package contents and need for critical areas review.	Conduct pre-application meeting Submit permit package; respond to request for additional information Total timeframe: 4 to 9 months, including public comment period, 21 day wait period after the permit is issued to allow for any party to appeal, and 14 day publication of shoreline permit application. The Growth Management Act requires local jurisdictions to complete the shoreline process within 120 days of receipt of a complete application; however, depending on the project and shoreline issues, the time frame may be extended to 9 months
HPA	Washington Department of Fish and Wildlife	Need SEPA process finalized before an HPA can be issued. JARPA form and corresponding design drawings.	Provide WDFW with copy of SEPA threshold determination and mitigation plan; determine any potential issues Once SEPA complete, submit JARPA Total timeframe: WDFW has 45 days from receipt of a complete application and receipt of SEPA threshold determination to issue or deny an HPA
CZMA Consistency Determination	Washington State Department of Ecology	Need Shoreline Substantial Development Permit CZMA form	Total time frame: Within 30 to 60 days after the shoreline permitting process is complete
401 Water Quality Certification	Washington State Department of Ecology	Need CZMA completed JARPA form and corresponding design drawings.	Total timeframe: Ecology has up to 1 year but typically the timeframe is 6 to 8 months (following Corps Public Notice)
Section 404 permit	U.S. Army Corps of Engineers	Need 401 Water Quality Certification and ESA completed JARPA form and corresponding design drawings.	Total timeframe: 12 to 18 months (length primarily due to ESA consultation)

Environmental Approvals Required for the Luther Burbank Project

Approval	Jurisdiction	Items Necessary Prior to Submittal	Next Steps/ Timeframe
Section 10 permit	U.S. Army Corps of Engineers	Need ESA completed JARPA form and corresponding design drawings.	Total timeframe: 2 to 3 months
Nationwide Permit	U.S. Army Corps of Engineers	Need ESA completed. JARPA form and corresponding design drawings.	Total timeframe: 45 days to 3 months
ESA Compliance	U.S. Fish and Wildlife Service National Marine Fisheries Service	Biological Assessment.	Total timeframe: 30 to 60 days if consultation is informal; 135 days if consultation is formal from the time the Services receive the Biological Assessment.
NEPA	U.S. Army Corps of Engineers	JARPA form and corresponding design drawings.	NEPA review may be required if the Corps implements any of the proposed activities, or if federal funding is received. If required, an approach for NEPA review would need to be developed.

PERMITTING CONSIDERATIONS FOR SPECIFIC SITE CONDITIONS

Shoreline

(City of Mercer Island – Ordinance No.05C-12; Section 4)

Shoreline designated environments are established to regulate development and uses consistent with the specific characteristics of a given segment of shoreline within the City of Mercer Island. The rules and regulations apply to a 200-foot setback measured from the OHW mark. All development within the designated (setback) area shall be consistent with the Shoreline Master Program, the Shoreline Management Act of 1971, the Mercer Island Development Code, and permit requirements of all other agencies having jurisdiction within the designated environment.

The shoreline of Lake Washington within Luther Burbank Park is designated as Park Conservancy. The main purpose of this environmental designation is the protection and management of existing natural resources and the provision of recreational opportunities.

Uses consistent with this designation include public recreational facilities and parks, moorage facilities, bulkheads and shoreline protective structures, utilities, dredging and alterations over

250 cubic yards – outside of a building footprint. All of these development options require a Shoreline Substantial Development Permit and a review under the SEPA.

Wetlands

(City of Mercer Island – Ordinance No.05C-12; Section 4)
The City uses the *Washington State Wetland Identification and Delineation Manual* to identify and delineate regulated wetlands within the city of Mercer Island. The wetland classification system is consistent with the *Washington State Wetland Rating System for Western Washington*.

The code distinguishes between wetlands that are naturally occurring and artificially created wetlands. With the exception of wetlands created to mitigate for impacts to naturally occurring wetlands, none of the artificially created wetlands are protected under the Critical Areas Ordinance.

Several potential wetlands have been identified within the park based on observed plant communities and hydrologic conditions. Two potential Category II wetlands exist—one at the northernmost end of the park, and the other one just south of the swim beach. One potential Category III wetland is located near the centrally located parking lot. In addition, there are three potential Category III wetlands, and one potential Category IV wetland within the park boundary.

Because no on-site surveys or delineations of potential wetlands were conducted, further field investigations would be necessary to confirm the presence, absence, boundaries, functions, and values of wetland systems within the City park property. To confirm wetland boundaries, wetland delineations should be conducted according to the methods defined in the *U.S. Army Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) and the *Washington State Wetland Identification and Delineation Manual* (Ecology 1997).

The standard buffer width required for a Category II wetland is 75 feet, but may be reduced to a minimum of 37 feet with enhancement. The standard buffer width required for a Category III wetland is 50 feet, but may be reduced to a minimum of 25 feet with enhancement. The standard buffer width required for a Category IV wetland is 35 feet, but may be reduced to a minimum of 25 feet with enhancement (Mercer Island City Code 19.07.080; C1).

Any activities associated with filling and grading operations, disturbance and removal of vegetation, and alterations of hydrology within the wetlands are restricted. However, alterations within Category III and IV wetlands under 2,500 square feet are allowed (MICC 19.07.080; D).

Impacts to a wetland buffer can be offset by buffer averaging by adding the prevented net loss of buffer area. However, some uses and associated alterations are allowed within the buffer area without the need to mitigate, such as pedestrian trails.

Watercourse

Watercourses within the park are regulated under the City's Critical Areas Ordinance (19.07.070). The code identifies three types of watercourses depending on whether or not they are used by fish and whether they are perennial or seasonal as follows.

Type I – Watercourses or reaches of watercourses used by fish, or located downstream of areas used by fish; the buffer area associated with this type designation is 75 feet, but can be reduced to 37 feet if a buffer enhancement is implemented.

Type 2 -- Watercourses or reaches of watercourses with year-round flow, not used by fish; the buffer area associated with this type designation is 50 feet, but can be reduced to 25 feet if a buffer enhancement is implemented.

Type 3 -- Watercourses or reaches of watercourses with intermittent or seasonal flow and not used by fish; the buffer area associated with this type designation is 35 feet, but can be reduced to 25 feet if a buffer enhancement is implemented.

A watercourse with potential fish use (Type 1) is designated within the wetland at the north end of the park. The buffer overlaps with the wetland and wetland buffer described above, and restrictions for both critical areas apply. A perennial (Type 2) watercourse is located just north of I-90, partially within the wetland south of the swimming beach, and the same overlap between the two regulated critical areas applies. Another perennial (Type 2) watercourse flows through the portion of the park that is located south of I-90. A seasonal (Type 3) watercourse originates at the very south end of the park and extends north across I-90.

ESA Species

Eagle

An active eagle nest is located northwest of the park. While the nest is not located on the actual park property, some areas of the park fall within the regulated zone around the nesting site. The City designates those areas used by these species for nesting, breeding, feeding and survival as wildlife habitat conservation areas (19.07.090 Wildlife Habitat Conservation Areas).

In addition, the state requires an eagle management plan to be approved by a WDFW eagle biologist for all development within 400 feet of a known nest site. State regulation of eagles does not prevent development, but does result in the retention of large trees and snags (where this can be done safely).

If changes to the wildlife habitat conservation area would be proposed, the code official may require a critical area study to ensure compliance with all state or federal laws.

Seasonal restrictions may apply during sensitive periods of the year: January 1 through August 15 during nesting, and November 1 through April 1 during winter roosting season. Activities may be further restricted and buffers may be increased during the specified seasons.

Salmonid Fish

Resident and anadromous salmonids, both juveniles and adults, use Lake Washington. Specific species utilizing the lake include chinook, coho, sockeye, cutthroat and rainbow/steelhead trout, and bull trout. Pink and chum salmon were historically abundant in the lake system, but now are considered extinct in the watershed (GLWTC 2001). The NMFS has identified chinook salmon, a threatened species, and coho salmon, a candidate species, as potentially occurring in the project vicinity (NMFS 2001). The USFWS indicates that bull trout may occur in Lake Washington. Any proposed changes to the shoreline at Luther Burbank Park would affect these species. The Master Plan is proposing improvements for the partially degraded shoreline, including regrading steeper areas to shallow sloping beaches and replenishing substrates, and enhancing and restoring native vegetation—all of which would have a positive impact on fish habitat and habitat function over existing conditions.

General Allowed and Restricted Alterations Applicable to All Critical Areas

The following potentially applicable alterations are allowable:

- Operation, maintenance, renovation or repair of existing structures, facilities and landscaping are allowed if there is no further intrusion or expansion into the critical area.
- Construction of new streets and driveways if it is designed to mitigate for impacts to critical areas so there will be no net loss of critical area, and if it is consistent with best management practices. A critical area study or restoration plan may be required by the code official.
- Removal of noxious weeds with hand labor or light equipment using appropriate erosion control measures and revegetation of native species.
- Non-motorized trails are an allowable use if certain conditions are met. The trail should be surfaced with pervious materials and be located to mitigate the encroachment.
- Conservation, preservation, restoration and enhancement of critical areas that do not negatively impact the functions of any critical area.
- Tree pruning, cutting, and removal in accordance with permit requirements as set forth in MICC chapter 19.10.

If a project is not allowed under the above-listed provisions, it may be allowed through a reasonable use exception.

REFERENCES

Ecology. 1997. *Washington State Wetland Identification and Delineation Manual*. Publication #96-94. Olympia, WA.

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Greater Lake Washington Technical Committee (GLWTC). 2001. Draft Reconnaissance Assessment-Habitat Factors that Contribute to the Decline of Salmonids. Greater Lake Washington Watershed WRIA 8. Prepared by the Greater Lake Washington Technical Committee.

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National Marine Fisheries Service (NMFS). 2001. Correspondence with the agency regarding threatened and candidate species occurring in the project area: July 13, 2001 email between Elizabeth Appy of Anchor Environmental and John Winton of the NMFS.

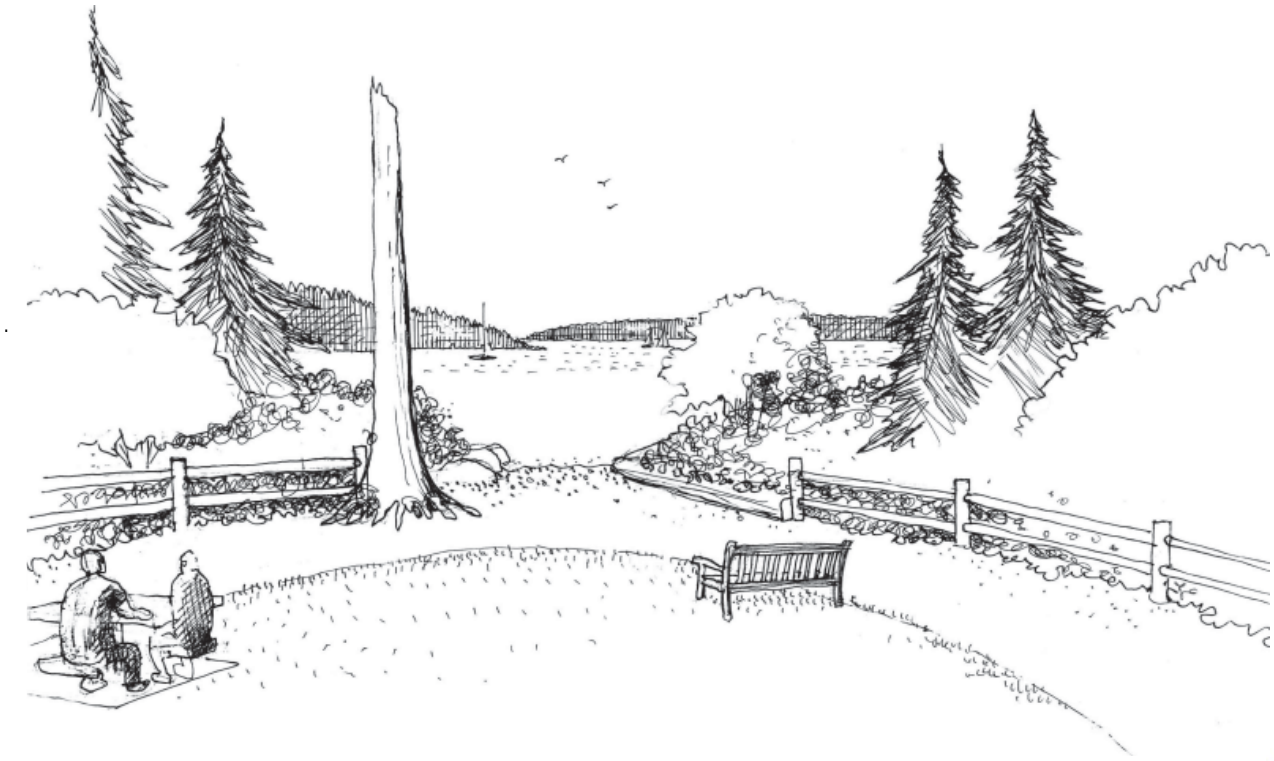
Luther Burbank Park Master Plan

City of Mercer Island, Washington

April 2006

Shoreline Access and Restoration
Description of Prototypes

Luther Burbank Park's shoreline provides a wide range of conditions including high functioning natural areas, and low to high intensity recreational use areas, some displaying significant erosion. The Master Plan proposes to conserve as well as modify segments of the park's 4280 linear feet of shoreline to address this range of conditions. A detailed inventory and analysis of shoreline habitat function was conducted at the beginning of the project as well as a wetland reconnaissance. These assessments are found in the appendix and provide the basis for determining which shoreline segments to conserve, which to restore, and which to provide higher intensity recreational access to. Conservation areas are essentially "no action" areas consisting of the highest functioning, intact natural shorelines. These conservation areas include the lacustrine wetlands bordering the shoreline at the north and south ends of the park. Restoration areas consist of low intensity recreation use areas forming much of the park's shoreline. These are areas where limited access to the water occurs, and where habitat has the best opportunity to be significantly improved for fish and wildlife. Higher intensity recreation use of the shoreline is proposed to occur in five specific areas comprising less than 20% of the total shoreline. In these more intensively used shoreline segments, larger beaches, generally without riparian vegetation are proposed for more concentrated access to Lake Washington. The following is a description of the three prototypical approaches to designing the shoreline to address habitat and human use in different locations and with different goals in mind.



ANCHOR ENVIRONMENTAL, L.L.C.

Habitat Restoration Prototype:

The goal of this prototype (see Figure 1) is to improve the shoreline for a wide range of native fish and wildlife species including salmon. Two key aspects of habitat structure are targeted by this restoration prototype: overhanging riparian vegetation, and substrate (lake bottom surface material). Each of these two structural elements support key habitat functions such as aquatic and terrestrial prey organisms (food for fish and wildlife) and refuge from predators (hiding places) both of which are important to rearing and survival of most native fish and wildlife species. Riparian vegetation would consist of native willow and red osier dogwood shrub/small tree species overhanging the water and planted in soils wrapped in a biodegradable fabric (coir matting) placed over and in front of existing low eroding banks. The willows and dogwood are effective at stabilizing the shoreline and preventing erosion once established and are the basis for this "biotechnical" erosion control approach. Behind these plantings, other native upland trees and shrubs are proposed to provide more layers of vegetation at higher levels. A gravel surfaced trail paralleling the shoreline is proposed landward of these plantings. In general, no excavation would be needed to perform the restoration, but placement of imported soil and gravel materials is needed. Substrate restoration consists of placing a sockeye salmon spawning gravel mix just below the willow plantings between the Ordinary High and Ordinary Low Water lines (OHW and OLW). There is a two foot difference in the lake's summer and winter water levels. These gravels are less than 1-1/2 inch in diameter and would cover the exposed "hard pan" presently devoid of gravels. Finally some woody debris is proposed in the restored areas between the OHW and OLW lines.

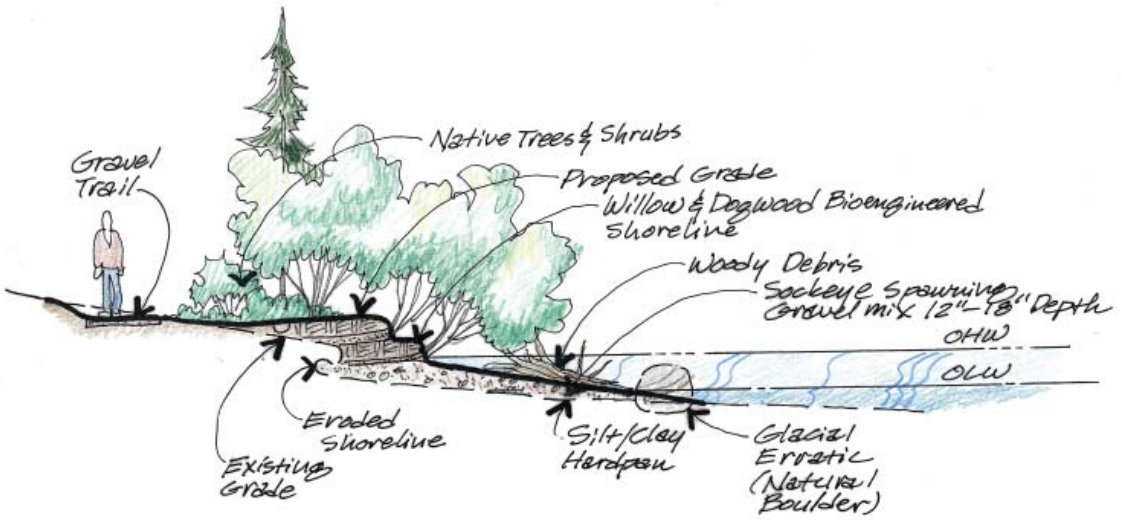


Figure 1

Micro Beach Prototype:

Periodically interspersed with the habitat restoration prototype, would be very small, "micro" beaches (see Figure 2). The goal of these beaches is the improve habitat substrate, as described above, but also to provide places for visitors to access the water on foot. Shallow draft small watercraft, such as kayaks and canoes could also use these micro beaches as landing sites. The beaches would include the same materials as the habitat prototype but consist of more beach and less restored vegetation. Some excavation and placement of gravel materials will be needed. The length of shoreline for each micro beach is intended to be no more than 30 feet. The width would be between 20 to 30 feet, with the widest point where the shoreline trail touches the beach. The gaps in riparian planting that the micro beaches form would be small enough that mature trees would spread over them. A combination of some buried rock covered with the spawning gravel described above, and large woody debris would form the edges of the beaches to help hold them in place. A similar effect is evident where some of the large poplar trees have fallen into the lake below the Park's office. This woody debris has allowed more sand and gravel to accumulate on the updrift (north) side of it.

Figure 2

Human Access Beach Prototype:

The goal of the human access beach prototype is to emphasize access to the water for relatively larger numbers of park visitors. However, these beaches will provide a significant improvement in habitat by improving substrate conditions beyond the hardpan, steep eroding banks, or vertical bulkheads that exist in these locations. In most cases, sockeye spawning substrate can be used as the surface material for these beaches. These beaches are limited to the following five areas identified in the Master Plan including: Calkins Point; off leash dog area; homeowner demonstration area ('morning lawn"); dock/boiler building small boat launching beach; and the swim beach (see Figures 3, 4, and 5). Some excavation would be needed at some locations and placement of beach gravel would be needed at all of them. The beaches range in shoreline length from a maximum of 240 to 300 feet (swim beach and Calkins Point) to a minimum of 60 to 100 feet (off leash dog beaches, and homeowner demonstration beach). Riparian planting is not proposed at these beaches in order to maximize recreational shoreline access and water views. A combination of some buried rock covered with the gravel and large woody debris would form the edges of the beaches to help hold them in place. Some areas have existing upland edge materials such as the swim beach and the bulkhead at the boiler building. Most of the other beaches willl require new edging materials to define the uplands from the beach. These edge materials are proposed to consist of durable and shoreline compatible products such as stone, and/or partially buried vinyl sheetpile with a continuous concrete cap twelve to eighteen inches wide (see Figures 3 and 4).

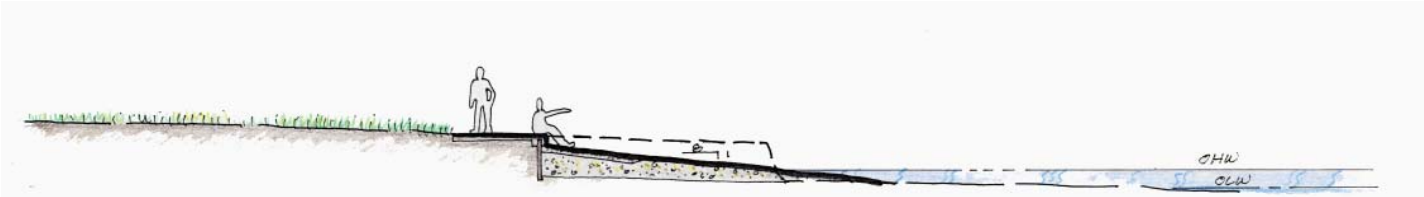


Figure 3

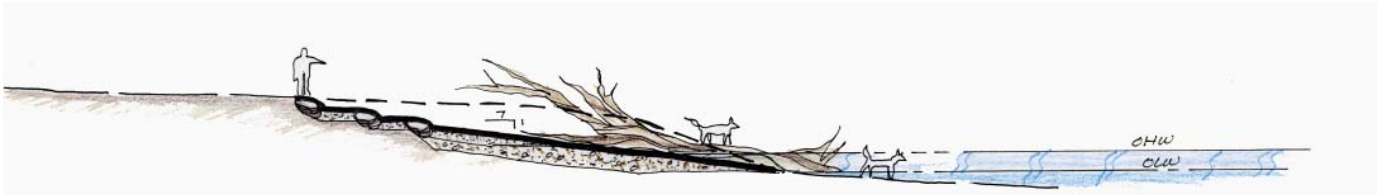


Figure 4

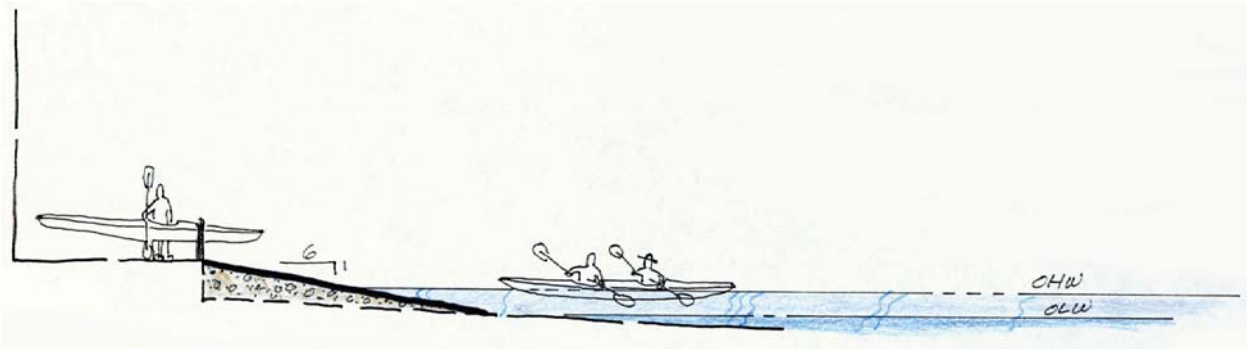


Figure 5

Luther Burbank Park
Draft Phasing Strategy
April 2006

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In considering phasing of park improvements for Luther Burbank Park there are countless ways in which the projects proposed in the master plan could be implemented. The intent of the Master Plan Report is to give current and future decision makers adequate information about the "parts" of the master plan so that phasing individual projects can be determined and adjusted as time passes and conditions change. However, there is a logical structure in which phasing can be approached. Key issues include constructability issues, ecological function, funding realities, and priority.

Constructability: Typically park construction projects are phased to accommodate construction realities such as access, areas of disturbance and sequence of construction. Targeting phases of work that can be constructed without disturbing areas designated for protection, and creation of phases that will not have to be "undone" in future construction projects are key phasing considerations. Because Luther Burbank is an existing park, and proposed improvements tend to mean adjustments to existing conditions (as opposed to a "blank slate" construction process), constructability is less of a driver of phasing plans. The two projects most affected by constructability are the two largest, shoreline improvements (much of which may be done by barge) and the integration of the west hill into the park.

Ecological Function: In considering possible park phasing, ecological function is key. In the preferred Luther Burbank design, ecologically sensitive areas (such as wetlands and steep slopes) largely remain unaltered and are therefore not a driver to the phasing of the project. The biggest ecological opportunity of the master plan is to improve shoreline conditions, both reducing erosion and improving habitat.

Funding Realities: The greatest driver in determining phasing of a project is typically the available funding and what can be accomplished with that funding. This master planning process is a proactive one, defining potential projects and costs prior to the establishment of a budget. This master plan and accompanying report should provide the structure for current and future decision makers to determine what projects might be pursued and when. During the City's biennial budget planning process, the City will likely want to consider a variety of methods to finance any park elements in the approved master plan, including local, state and federal park, recreation and natural resource grants.

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Prioritization: We offer the following logic to help prioritize the park improvements outlined in the preferred plan.

- High Priority projects: Projects that stop deterioration of, or upgrade, existing park facilities to better serve both quality and quantity of user experiences should be considered a priority. These include
    - Stabilization of eroding shoreline
    - Safety and mechanical upgrades of existing restrooms
    - Restructuring of the campus play area and new play equipment
    - Path surface and drainage improvements to existing path network
    - Off leash area surface and fencing improvements
    - Improved drainage, irrigation and soil conditions of high use/impact lawn areas
- Medium Priority Projects: New or improved park elements, usually of medium to large scale that present an opportunity to improve the overall function and character of the park. These include:
    - Integrating the West Hill into the larger park
    - Creation of downtown entry and key connection over the Burbank Lid to both Upper and Lower Luther Burbank Park areas.
    - Formalized east-west and loop trails in Upper Luther Burbank.
    - Formalized connections, including stairs, between the Mercer View Community Center and the campus area.
    - The development of human powered boat facilities.
- Other Opportunities: Primarily smaller projects that have a more isolated effect, which can be implemented on a piecemeal basis These include:
    - The ropes course, canopy overlook and sheltering Upper Luther
    - The car-top boat launch.
    - Spray Park and volleyball court at the swim beach
    - Amphitheater Improvements
    - Barn enhancements.

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Consideration of all of the above points should allow a decision-making structure to guide phasing of the improvement to Luther Burbank Park. The clear phasing priority that has emerged through the design and public involvement process is erosion control and habitat enhancement at the shoreline areas, notably on the northern half of the park, and in particular in the Calkins Point area.

End of Report

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