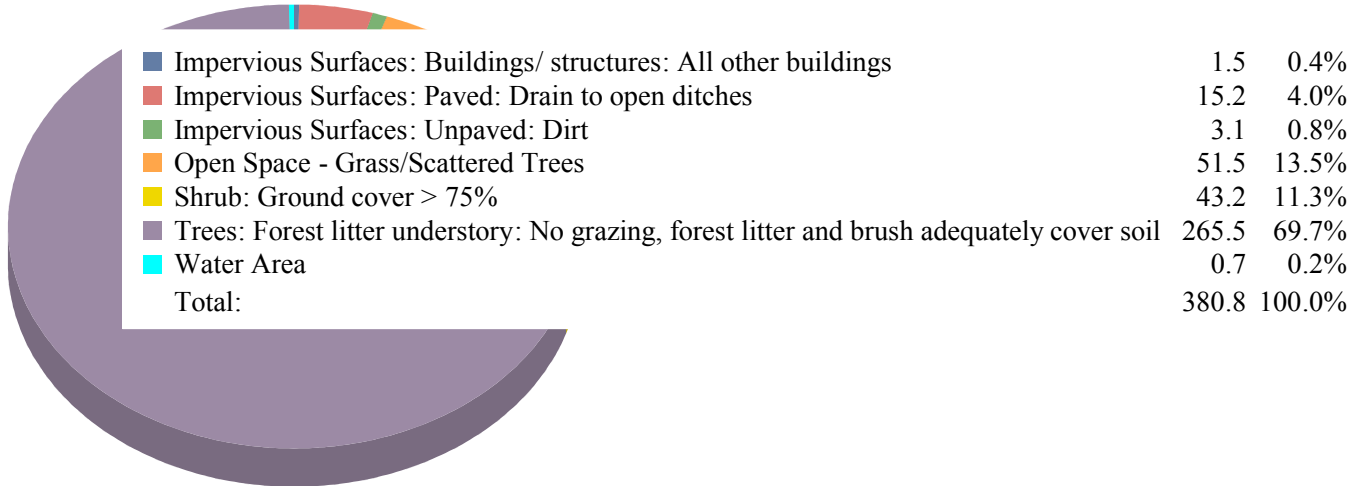


Analysis Report

for

Parks, Open Space, Street Ends

Land cover areas are in acres.



Total Tree Canopy: 265.5 acres (69.7%)

Air Pollution Removal

By absorbing and filtering out nitrogen dioxide (NO₂), sulfur dioxide (SO₂), ozone (O₃), carbon monoxide (CO), and particulate matter less than 10 microns (PM₁₀) in their leaves, urban trees perform a vital air cleaning service that directly affects the well-being of urban dwellers. CITYgreen estimates the annual air pollution removal rate of trees within a defined study area for the pollutants listed below. To calculate the dollar value of these pollutants, economists use “externality” costs, or indirect costs borne by society such as rising health care expenditures and reduced tourism revenue. The actual externality costs used in CITYgreen of each air pollutant is set by the each state, Public Services Commission.

Nearest Air Quality Reference City: **Seattle**

	<u>Lbs. Removed/yr</u>	<u>Dollar Value</u>
<i>Carbon Monoxide:</i>	1,424	\$608
<i>Ozone:</i>	7,832	\$24,062
<i>Nitrogen Dioxide:</i>	3,560	\$10,937
<i>Particulate Matter:</i>	7,357	\$15,091
<i>Sulfur Dioxide:</i>	3,560	\$2,672
<u>Totals:</u>	23,734	\$53,370

Carbon Storage and Sequestration

Trees remove carbon dioxide from the air through their leaves and store carbon in their biomass. Approximately half of a tree’s dry weight, in fact, is carbon. For this reason, large-scale tree planting projects are recognized as a legitimate tool in many national carbon-reduction programs. CITYgreen estimates the carbon storage capacity and carbon sequestration rates of trees within a defined study area.

Total Tons Stored:	11,457.09
Total Tons Sequestered (Annually):	89.20

Analysis Report

for

Parks, Open Space, Street Ends

Stormwater

Trees decrease total stormwater volume and slow peak flow; both help cities to manage their stormwater and decrease detention costs. CITYgreen assesses how land cover, soil type, slope, and precipitation affect stormwater runoff volume, time of runoff concentration, and runoff peak flows. It calculates the volume of runoff in a 2-year 24-hour storm event that would need to be contained by stormwater facilities if the vegetation were removed. This volume multiplied by local construction costs calculate the dollars saved by the tree canopy. CITYgreen uses the TR-55 model developed by the Natural Resource Conservation Service (NRCS) which is very effective in evaluating the effects of land cover/land use changes and conservation practices on stormwater runoff. The infiltration percentage in the report estimates the decrease in ground water recharge when the vegetation is replaced by impervious surface.

Water Quantity (Runoff)

2-yr, 24-hr Rainfall: 2.50 in.

Rainfall Distribution Type: IA

Curve Number reflecting existing conditions: 72

Curve Number using default replacement landcover: 91

% change

Time of Concentration: -46.72

Peak Flow: 246.73

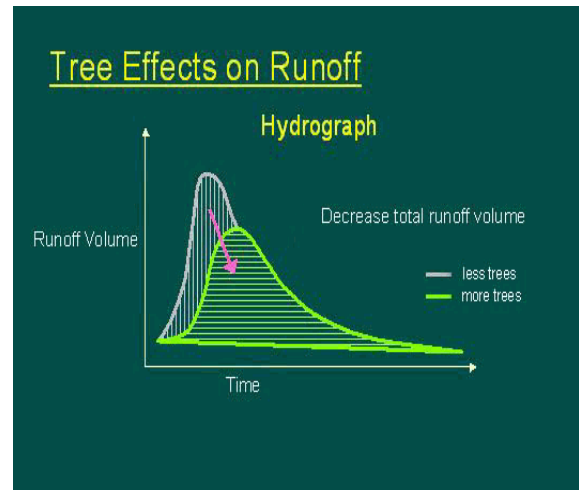
Potential for Infiltration: -42.04

Additional Storage volume needed
(to mitigate the change in peak flow): 595,736 cu. ft.

Construction cost per cu. ft.: \$2.00

Total Stormwater Savings: \$1,191,471

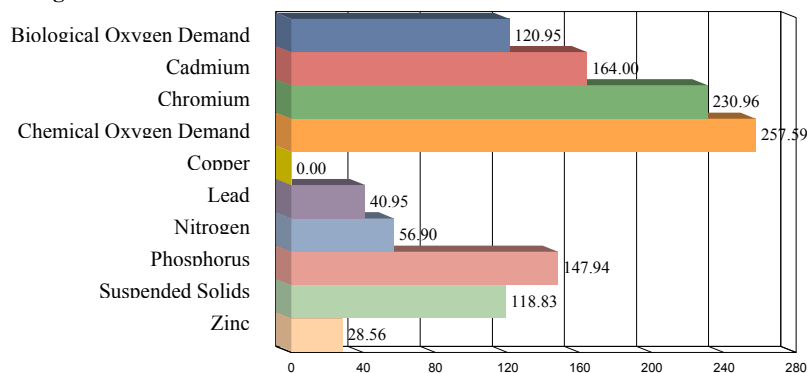
**Annual costs based on payments
over 20 years at 6% interest: \$103,878 per year**



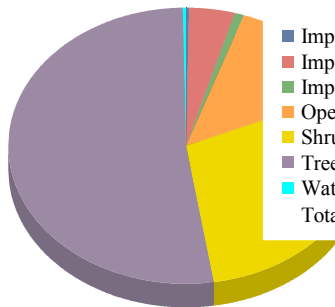
Water Quality (Contaminant Loading)

Cities must comply with Federal clean water regulations and develop plans to improve the quality of their streams and rivers. Trees filter surface water and prevent erosion, both of which maintain or improve water quality. Using values from the US Environmental Protection Agency (EPA) and Purdue University's L-thia spreadsheet water quality model, American Forests developed the CITYgreen water quality model. This model estimates the change in the concentration of the pollutants in runoff during a typical storm event given the change in the land cover. This model estimates the Event Mean Concentrations of Nitrogen, Phosphorus, Suspended Solids, Zinc, Lead, Copper, Cadmium, Chromium, Chemical Oxygen Demand(COD), and Biological Oxygen Demand (BOD). Pollutant values are shown as a percentage of change.

Percent Change in Contaminant Loadings



for Parks, Open Space, Street Ends: 25% trees become shrub



	Acres	Percentage
Impervious Surfaces: Buildings/ structures: All other buildings	1.5	0.4%
Impervious Surfaces: Paved: Drain to open ditches	15.2	4.0%
Impervious Surfaces: Unpaved: Dirt	3.1	0.8%
Open Space - Grass/Scattered Trees	51.6	13.5%
Shrub: Ground cover > 75%	109.6	28.8%
Trees: Forest litter understory: No grazing, forest litter and brush adequately cover soil	199.1	52.3%
Water Area	0.7	0.2%
Total:	380.8	100.0%

Land cover areas are in acres

Total Tree Canopy: 199.1 acres (52.3%)

Air Pollution Removal

Nearest Air Quality Reference City: **Seattle**

	<u>Lbs. Removed/yr</u>	<u>Dollar Value</u>
Carbon Monoxide:	1,065	\$455
Ozone:	5,858	\$17,997
Nitrogen Dioxide:	2,663	\$8,180
Particulate Matter:	5,503	\$11,288
Sulfur Dioxide:	2,663	\$1,998
Totals:	17,752	\$39,918

Carbon Storage and Sequestration

Total Tons Stored:	8,569.28
Total Tons Sequestered (Annually):	66.71

Stormwater

Water Quantity (Runoff)

2-yr, 24-hr Rainfall: 2.50 in.

Rainfall Distribution Type: IA

Curve Number reflecting existing conditions: 72
Curve Number using modeled landcover: 71

% change

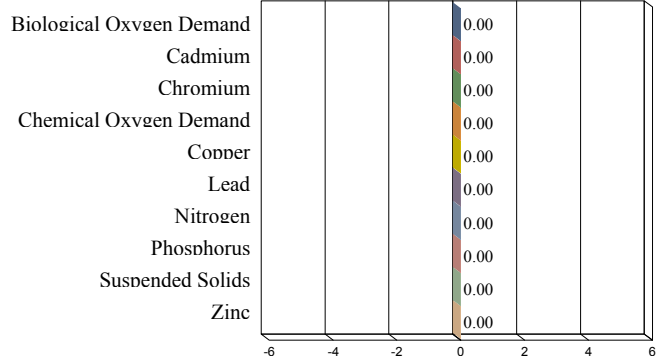
Time of Concentration: 2.78
Peak Flow: -7.59
Potential for Infiltration: -0.14
Additional Storage volume needed
(to mitigate the change in peak flow): 85,572 cu. ft.
Construction cost per cu. ft.: \$2.00

Total Stormwater Savings: \$171,145

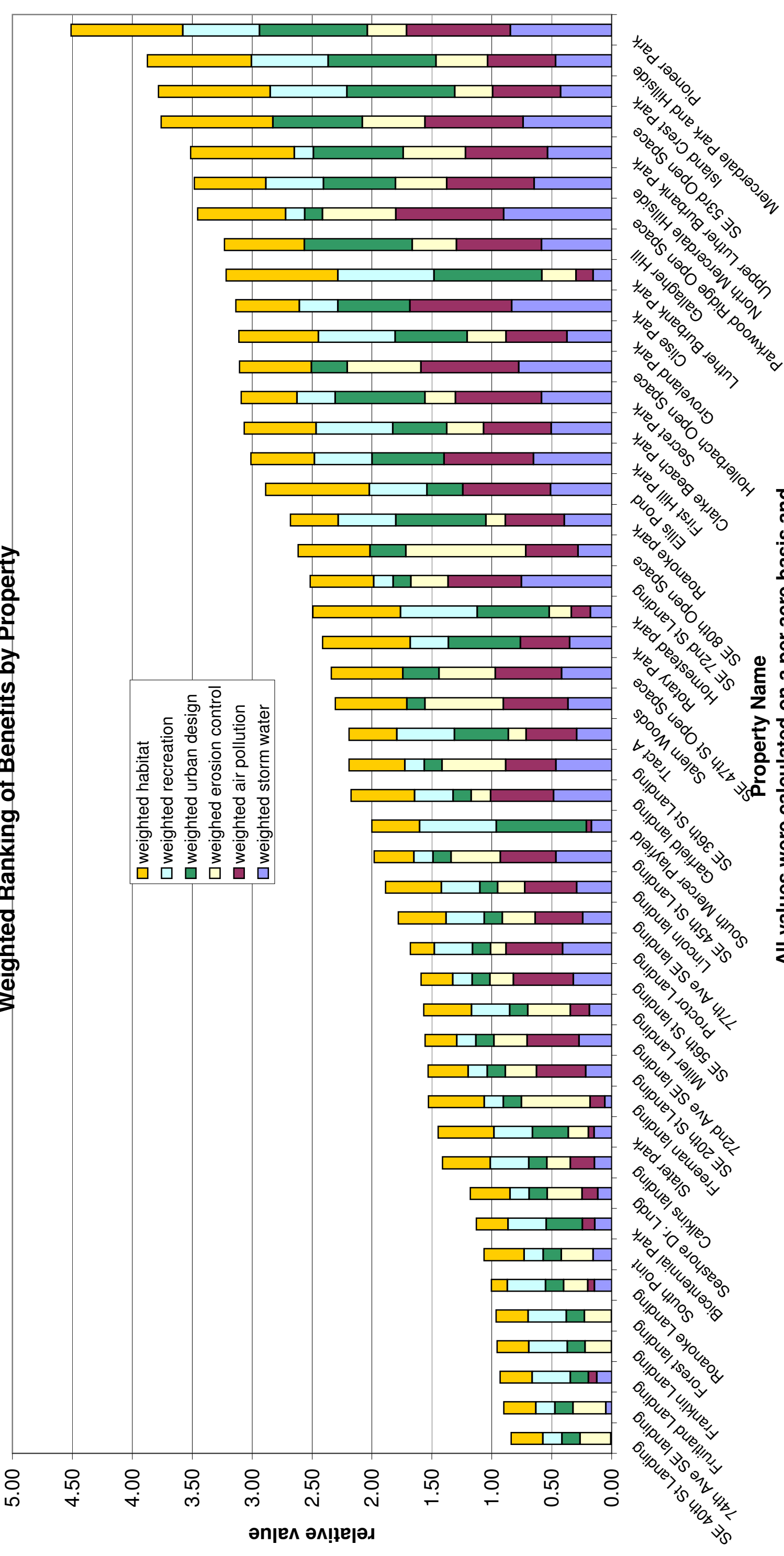
**Annual costs based on payments
over 20 years at 6% interest: \$14,921 per year**

Water Quality (Contaminant Loading)

Percent Change in Contaminant Loadings



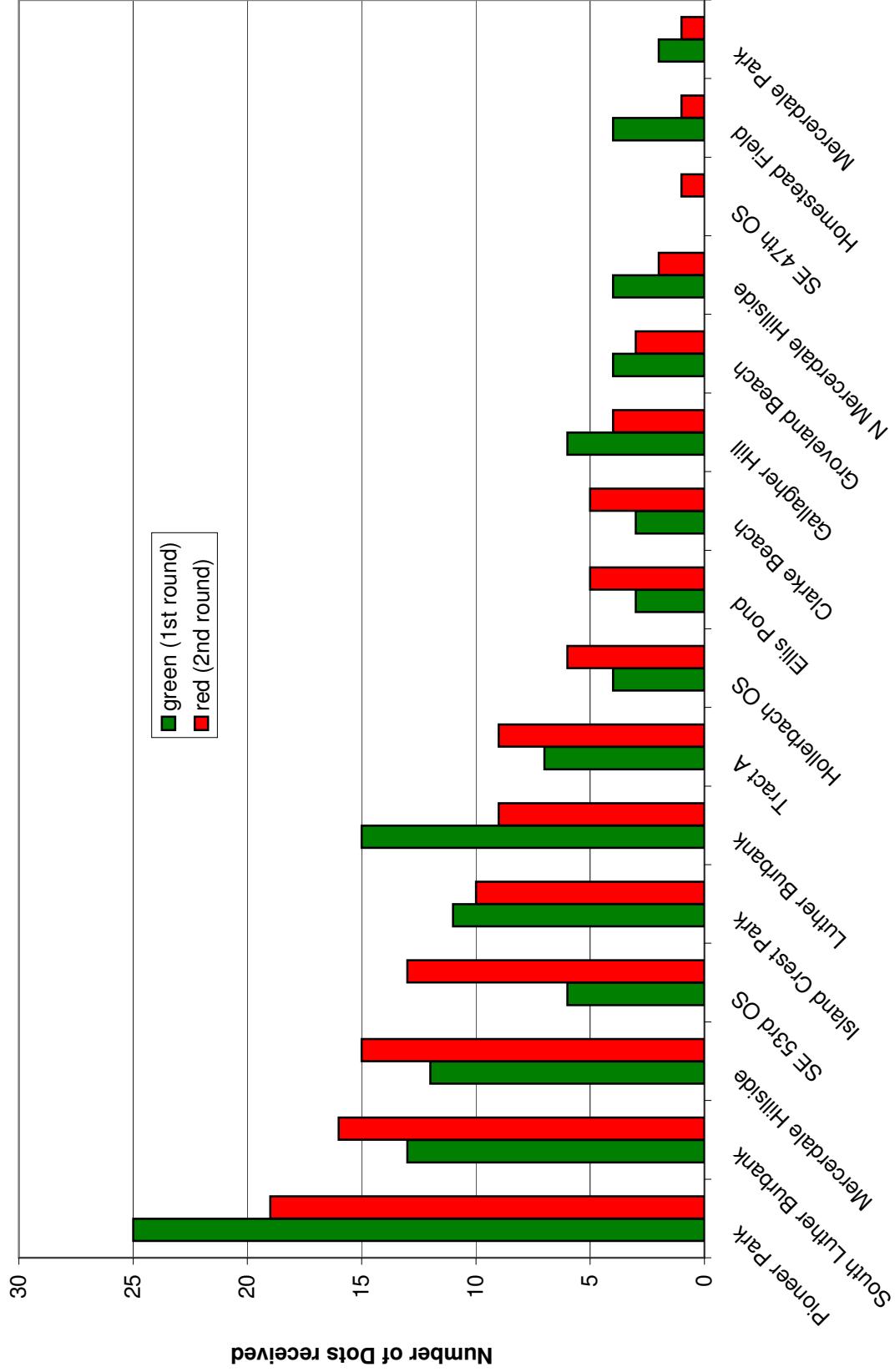
Open Space Vegetation Plan Appendix B: Weighted Ranking of Benefits by Property



Property Name

All values were calculated on a per acre basis and weighted by the rating of values from public meetings.

Open Space Vegetation Plan Appendix C: Results of "Sticky Dot" Exercise



Park Name	weighted storm water	weighted air pollution	weighed erosion control	weighted urban design	weighted recreation	weighted habitat	sum of weighted criteria
SE 40th St Landing	0.01	0.00	0.26	0.15	0.16	0.27	0.84
74th Ave SE landing	0.05	0.00	0.28	0.15	0.16	0.27	0.90
Fruitland Landing	0.12	0.07	0.00	0.15	0.32	0.27	0.93
Franklin Landing	0.00	0.00	0.22	0.15	0.32	0.27	0.96
Forest landing	0.00	0.00	0.23	0.15	0.32	0.27	0.96
Roanoke Landing	0.14	0.06	0.20	0.15	0.32	0.13	1.00
South Point	0.15	0.00	0.27	0.15	0.16	0.33	1.06
Bicentennial Park	0.14	0.10	0.00	0.30	0.32	0.27	1.13
Seashore Dr. Lndg	0.12	0.13	0.29	0.15	0.16	0.33	1.18
Calkins landing	0.14	0.20	0.20	0.15	0.32	0.40	1.41
Slater park	0.15	0.05	0.17	0.30	0.32	0.47	1.45
Freeman landing	0.06	0.12	0.57	0.15	0.16	0.47	1.53
SE 20th St Landing	0.21	0.41	0.26	0.15	0.16	0.33	1.53
72nd Ave SE landing	0.27	0.43	0.28	0.15	0.16	0.27	1.56
Miller Landing	0.19	0.16	0.36	0.15	0.32	0.40	1.57
SE 56th St landing	0.32	0.50	0.19	0.15	0.16	0.27	1.59
Proctor Landing	0.41	0.47	0.13	0.15	0.32	0.20	1.68
77th Ave SE landing	0.24	0.40	0.27	0.15	0.32	0.40	1.78
Lincoln landing	0.29	0.43	0.22	0.15	0.32	0.47	1.89
SE 45th St Landing	0.46	0.47	0.41	0.15	0.16	0.33	1.98
South Mercer Playfield	0.17	0.04	0.00	0.75	0.64	0.40	2.00
Garfield landing	0.48	0.52	0.16	0.15	0.32	0.53	2.18
SE 36th St Landing	0.46	0.42	0.53	0.15	0.16	0.47	2.19
Tract A	0.29	0.42	0.15	0.45	0.48	0.40	2.19
Salem Woods	0.36	0.54	0.65	0.15	0.00	0.60	2.31
SE 47th St Open Space	0.42	0.55	0.47	0.30	0.00	0.60	2.34
Rotary Park	0.35	0.41	0.00	0.60	0.32	0.73	2.41
Homestead park	0.18	0.16	0.19	0.60	0.64	0.73	2.49
SE 72nd St Landing	0.75	0.61	0.31	0.15	0.16	0.53	2.52
SE 80th Open Space	0.28	0.44	1.00	0.30	0.00	0.60	2.62
Roanoke park	0.39	0.49	0.16	0.75	0.48	0.40	2.68
Ellis Pond	0.51	0.73	0.00	0.30	0.48	0.87	2.89

Park Name	weighted storm water	weighted air pollution	weighed erosion control	weighted urban design	weighted recreation	weighted habitat	sum of weighted criteria
First Hill Park	0.65	0.75	0.00	0.60	0.48	0.53	3.01
Clarke Beach Park	0.50	0.56	0.31	0.45	0.64	0.60	3.07
Secret Park	0.58	0.72	0.25	0.75	0.32	0.47	3.09
Hollerbach Open Space	0.77	0.82	0.61	0.30	0.00	0.60	3.10
Groveland Park	0.37	0.51	0.33	0.60	0.64	0.67	3.11
Clise Park	0.83	0.85	0.00	0.60	0.32	0.53	3.14
Luther Burbank Park	0.15	0.14	0.29	0.90	0.80	0.93	3.22
Gallagher Hill	0.58	0.71	0.37	0.90	0.00	0.67	3.23
Parkwood Ridge Open Space	0.90	0.90	0.61	0.15	0.16	0.73	3.45
North Mercedale Hillside	0.65	0.73	0.43	0.60	0.48	0.60	3.48
Upper Luther Burbank Park	0.54	0.68	0.52	0.75	0.16	0.87	3.51
SE 53rd Open Space	0.74	0.82	0.52	0.75	0.00	0.93	3.76
Island Crest Park	0.42	0.57	0.32	0.90	0.64	0.93	3.78
Mercedale Park and Hillside	0.47	0.57	0.43	0.90	0.64	0.87	3.87
Pioneer Park	0.85	0.87	0.33	0.90	0.64	0.93	4.51

Park Name	Location	Classification	Total acreage	relative per acre cost savings - Storm water	relative per acre cost savings - Air Pollution	normalized average slope	Habitats		
72nd Ave SE landing	1605 72nd Ave SE	Undeveloped Street End	0.17	0.30	0.48	0.28	landscaped shrubland		
74th Ave SE landing		Undeveloped Street end	0.05	0.05	0.00	0.28	landscaped shrubland		
77th Ave SE landing	7670 SE 22nd St	Developed Street End	0.29	0.27	0.44	0.27	landscaped tree savanah		
Bicentennial Park	77th Ave SE & SE 32nd St	Park	0.10	0.15	0.12	0.00	medium development		
Calkins landing	SE 28th St and 60 Ave SE	Developed Street End	0.31	0.16	0.23	0.20	Landscaped grassland		
Clarke Beach Park	7700 East Mercer Way	Park	9.05	0.56	0.63	0.31	mature deciduous forest (20-30")	landscaped grassland	immature deciduous forest (5-15")
Clise Park	n St & lland Cre	Park	1.72	0.93	0.95	0.00	mixed conifer/deciduous (5-15)	mixed conifer/deciduous 20-30	
Ellis Pond	SE 47th St and 90th Ave SE	Park	4.04	0.56	0.81	0.00	palustrine scrub-shrub wetland	palustrine forested wetland	deciduous forest 15-20"
First Hill Park	SE 32nd St & 72dn Ave SE	Park	0.83	0.72	0.83	0.00	Light development	Landscaped tree savanah	conifer forest
Forest landing	SE 43rd ST and forest Ave SE	Developed Street End	0.03	0.00	0.00	0.23	Light development		
Franklin Landing	78th Ave SE and SE 42nd St.	Developed Street End	0.03	0.00	0.00	0.22	landscaped grassland		
Freeman landing		Undeveloped	0.21	0.06	0.14	0.57	shrubland		
Fruitland Landing	97th Ave SE & SE 34th St.	Developed ROW	0.15	0.14	0.08	0.00	landscaped grassland		
Gallagher Hill	3701 SE Gallagher Hill road	Open space	11.34	0.65	0.79	0.37	deciduous (5-15)	deciduous (15-20)	riparian
Garfield landing	SE 30th St and 60th Ave SE	Developed Street End	0.34	0.54	0.58	0.16	landscaped tree savanah		
Groveland Park	SE 58th St & 80th Ave SE	Park	3.07	0.41	0.56	0.33	Heavy development	Light development	landscaped forest
Hollerbach Open Space	SE 45th St and 91st Ave SE	Open space	5.18	0.86	0.91	0.61	deciduous forest 15-20"	mixed conifer/deciduous forest 15-20'	

Park Name	Location	Classification	Total acreage	relative per acre cost savings - Storm water	relative per acre cost savings - Air Pollution	normalized average slope	Habitats		
Homestead park	Ave SE & SE 4	Park	11.09	0.19	0.18	0.19	Medium Development	landscaped grassland	deciduous forest 15-20
Island Crest Park	5500 Island Crest way	Park	38.91	0.47	0.63	0.32	medium development	mixed conifer/deciduous forest (20-30)	riparian forest (2030)
Lincoln landing	76th St SE and SE 22nd	Developed Street End	0.23	0.32	0.48	0.22	Landscaped tree savannah		
Luther Burbank Park	2040 84th ave SE	Park	54.52	0.17	0.16	0.29	Deciduous forest (20-30), (5-15)	conifer/broadleaf evergreen mix (15-20)	landscaped forest
Mercerdale Hillside	77th Ave SE and SE 32nd St.	Open space	18.59	0.72	0.82	0.43	deciduous forest (20-30)	deciduous forest (15-20)	mixed conifer/deciduous forest (20-30)
Mercerdale Park	77th Ave SE and SE 32nd St	Park	12.17	0.23	0.33	0.31	light development	landscaped grassland	deciduous forest (5-15)
Miller Landing	4765 Forest Ave SE	Developed Street End	0.30	0.21	0.17	0.36	light development		
North Mercerdale Hillside	7415 SE 27th ST	Open space	6.20	0.72	0.81	0.43	deciduous forest (15-20)	shrubland	
Parkwood Ridge Open Space	9165 Parkwood Ridge Dr.	Open Space	3.80	1.00	1.00	0.61	deciduous forest (15-20")	mature conifer/deciduous mixed forest	riparian deciduous forest (15-20)
Pioneer Park	SE 68th and Island Crest Way	Park	118.85	0.94	0.96	0.33	Conifer forest (15-20)	Conifer forest (20-30)	landscaped tree savannah
Proctor Landing	SE 32nd St and 60th Ave SE	Developed Street End	0.30	0.45	0.52	0.13	medium development		
Roanoke Landing	W. Mercer Way and roanoke Way	Developed Street End	0.18	0.16	0.06	0.20	Heavy development		
Roanoke park	70th Ave SE and West Mercer Way	Park	1.46	0.44	0.55	0.16	landscaped tree savannah	medium development	
Rotary Park	88th Ave SE & SE 44th St	Park	4.83	0.39	0.46	0.00	Heavy development	Landscaped forest	Conifer/deciduous mixed forest (15-20")
Salem woods	6300 90th Ave SE	Open space	0.35	0.40	0.60	0.65	deciduous forest (20-30)	forested wetland	
SE 20th St Landing		Undeveloped Street End	0.14	0.24	0.46	0.26	landscaped deciduous forest		
SE 36th St Landing	69th Ave SE and SE Maker St.	Undeveloped Street End	0.10	0.51	0.47	0.53	Landscaped grassland	deciduous forest (20-30)	

Park Name	Location	Classification	Total acreage	relative per acre cost savings - Storm water	relative per acre cost savings - Air Pollution	normalized average slope	Habitats		
SE 40th St Landing	End of SE 40th St.	Undeveloped Street End	0.03	0.01	0.00	0.26	landscaped shrubland		
SE 45th St Landing		Undeveloped Street End	0.09	0.51	0.52	0.41	Landscaped forest		
SE 47th St Open Space	4701 E Mercer Way	Open Space	1.53	0.46	0.61	0.47	deciduous forest 15-20"	deciduous forest 20-30"	mixed conifer/deciduous forest 15-20"
SE 53rd Open Space	SE 53rd Pl	Open space	24.97	0.82	0.91	0.52	deciduous forest (15-20")	deciduous forest (5-15")	mixed conifer/deciduous forest
SE 56th St landing	5495 W Mercer Way	Undeveloped Street End	0.21	0.36	0.56	0.19	landscaped forest		
SE 72nd St Landing	9603 SE 72nd PL	Developed Street End	0.12	0.84	0.68	0.31	medium development	conifer forest (5-15")	
SE 80th Open Space	8599 SE 80th St.	Open space	3.92	0.31	0.48	1.00	mature deciduous forest (20-30")	deciduous forest (15-20")	mixed conifer/deciduous forest 20-30"
Seashore Dr. Lndg		Undeveloped Street End	0.04	0.13	0.15	0.29	deciduous forest (5-15)		
Secret Park	SE 27th St and West Mercer Way	Park	0.86	0.65	0.80	0.25	Light development	conifer forest (15-20)	
Slater park	2835 60th Pl SE	Park	0.68	0.16	0.05	0.17	Light development	landscaped grassland	
South Mercer Playfield	SE 78th St & *3th Ave SE	Parl/School	17.31	0.19	0.05	0.00	medium development	landscaped grassland	landscaped tree savanah
South Point	790 85th Ave S	Developed Street End	0.03	0.17	0.00	0.27	landscaped tree savanah		
Tract A	7400 86th Ave SE	Open space	3.02	0.32	0.47	0.15	mature deciduous forest (20-30")	deciduous forest (5-15")	landscaped grassland
Upper Luther Burbank Park	84th Avenue SE and SE 33rd Street	Open space	18.07	0.59	0.76	0.52	deciduous forest (20-30)	deciduous forest (5-15)	mixed conifer/deciduous forest (20-30)

Park Name	Invasive plants			Natural Habitat Conditions: size	rarity	connectivity	diversity	A/P ratio	Area to Perimeter ratio	vegetation condition	Habitat Rating
72nd Ave SE landing				Low	Low	2	Low	8	Low	Good	0.2
74th Ave SE landing	Japanese Knotweed along east side of landing			Low	Low	2	Low	11	Low	Poor	0.2
77th Ave SE landing	wisteria, blackberry and laurel along west edge of landing			Medium	Low	2	Low	16	Low	Poor	0.2
Bicentennial Park	ivy on trees through north end of park			Low	Low	2	Low	15	Low	Patchy	0.2
Calkins landing	Laurel and Blackberry on north side of park			Medium	Low	2	Low	25	Low	Patchy	0.2
Clarke Beach Park	ivy in parking lot and entrance	ivy growing up trees, and throughout understory	laurel, holly and blackberry also along trail	Medium	Medium		Medium	86	Medium	Poor	0.6
Clise Park	ivy in south end of park	laurel and ivy removal in progress	dead ivy on trees	Medium	Medium	0	Low	63	Medium	Patchy	0.3
Ellis Pond	blackberry understory, dominant in forest	holly, laurel along trail		High	High	0	High	57	Medium	Poor	0.9
First Hill Park	ivy is present in forest			Low	Medium		Medium	24	Low	Patchy	0.2
Forest landing	ivy on side garden planting areas			Low	Low	2	Low	8	Low	Patchy	0.2
Franklin Landing	ivy and blackberry present			Low	Low	2	Low	6	Low	Patchy	0.2
Freeman landing	100% blackberry cover on hill			Medium	Medium	2	Low	21	Low	Poor	0.2
Fruitland Landing	not a problem			Low	Low	2	Low	16	Low	Good	0.2
Gallagher Hill	Ivy cover 100% and on trees throughout north and west sides	blackberry high cover in east side of park, and in upper	Herb robert along road edge	Medium	Medium	1	Low	101	High	Poor	0.5
Garfield landing	ivy and blackberry along south edge			Medium	Low	2	Low	22	Low	Patchy	0.2
Groveland Park	Ivy present in forest areas, on trees in landscaped forest			Medium	Medium	2	Medium	35	Medium	Patchy	0.5
Hollerbach Open Space	ivy growing up trees and in understory	blackberry in understory	invasives 100% in some areas	Medium	Medium	3	Low	100	High	Poor	0.7

Park Name	Invasive plants			Natural Habitat Conditions: size	rarity	connectivity	diversity	A/P ratio	Area to Perimeter ratio	vegetation condition	Habitat Rating
Homestead park	Reed canary grass in wet area	ivy dominant in understory	ivy on trees	Medium	Medium	1	High	68	Medium	Poor	0.5
Island Crest Park	Blackberry and holly present in SW	Ivy on trees in riparian forest areas		High	High	1	Medium	199	High	Patchy	0.8
Lincoln landing	Blackberry along west edge			Medium	Low	2	Low	22	Low	Patchy	0.2
Luther Burbank Park	Blackberry prominent in landscaped forests, and tree	Ivy on trees in deciduous forests		High	High	3	High	84	Medium	Patchy	0.9
Mercerdale Hillside	Ivy patches dominant in middle of park. Ivy on trees	blackberry in large patches through out park.		High	High	2	Low	147	High	Patchy	0.8
Mercerdale Park	ivy and holly intermitent in forest	blackberry near trails	reed canary grass, blackberry, buttercup, holly,	Medium	Low	2	Medium	91	Medium	Good	0.5
Miller Landing	ivy on trees			Medium	Low	2	Low	14	Low	Poor	0.2
North Mercerdale Hillside	Blackberry is dominant in wet forest clearing	Ivy everywhere, and on trees	Laurel present	Medium	Medium	0	Low	115	High	Poor	0.7
Parkwood Ridge Open Space	Ivy growing up trees	ivy patchy in understory		Medium	Medium	3	Low	72	Medium	Patchy	0.5
Pioneer Park	Ivy on trees in all quadrants.	Ivy removal in NE quadrant ravine	Ivy on dominanting understory in patches of SE	High	High	2	Medium	333	High	Patchy	1
Proctor Landing				Medium	Low	2	Low	19	Low	Good	0.2
Roanoke Landing				Low	Low	2	Medium	8	Low	Good	0.2
Roanoke park	ivy patches in south west corner of park			Low	Low	0	Medium	29	Low	Good	0.2
Rotary Park	blackberry, ivy, laurel and herb robert along trails	ivy growing up maple		High	Low	0	Medium	32	Medium	Patchy	0.3
Salem woods	Blackberry and Ivy along hillside			Low	Medium	2	Low	31	Medium	Patchy	0.2
SE 20th St Landing	Ivy on trees			Low	Low	2	Low	18	Low	Poor	0.2
SE 36th St Landing	mature ivy on trees	Blackberry understory		Low	low	2	low	10	Low	Poor	0.2

Park Name	Adjacent Land Uses: North	East	South	West	public ROW aesthetics	separates incompatible land uses	provides neighborhood privacy	Urban Design rating	Recreation rating
72nd Ave SE landing	shoreline	private shoreline	roadway	private shoreline	0	0	1	0.17	0.20
74th Ave SE landing	shoreline	private shoreline	roadway	private shoreline	0	0	1	0.17	0.20
77th Ave SE landing	shoreline	private shoreline	roadway	private shoreline	0	0	1	0.17	0.40
Bicentennial Park	commercial development	roadway	city development	park open space	1	1	0	0.33	0.40
Calkins landing	residential shoreline	roadway	residential shoreline	shoreline	0	0	1	0.17	0.40
Clarke Beach Park	residential	shoreline	residential	roadway	1	1	1	0.50	0.80
Clise Park	roadway/residential	residential	roadway	roadway	2	1	1	0.67	0.40
Ellis Pond	residential	roadway	residential	residential	0	0	2	0.33	0.60
First Hill Park	residential	residential	roadway/residential	roadway/residential	1	1	2	0.67	0.60
Forest landing	residential	residential	residential	shoreline	0	0	1	0.17	0.40
Franklin Landing	residential	residential	shoreline	shoreline	0	0	1	0.17	0.40
Freeman landing	residential	residential	private shoreline	shoreline	0	0	1	0.17	0.20
Fruitland Landing	lakeshore	residential	residential	residential	0	0	1	0.17	0.40
Gallagher Hill	I-90 Freeway	roadway	roadway	residential	2	2	2	1.00	0.00
Garfield landing	residential	roadway	residential	shoreline	0	0	1	0.17	0.40
Groveland Park	residential	roadway/residential	residential	shoreline	0	2	2	0.67	0.80
Hollerbach Open Space	residential	residential	residential	residential	0	0	2	0.33	0.00

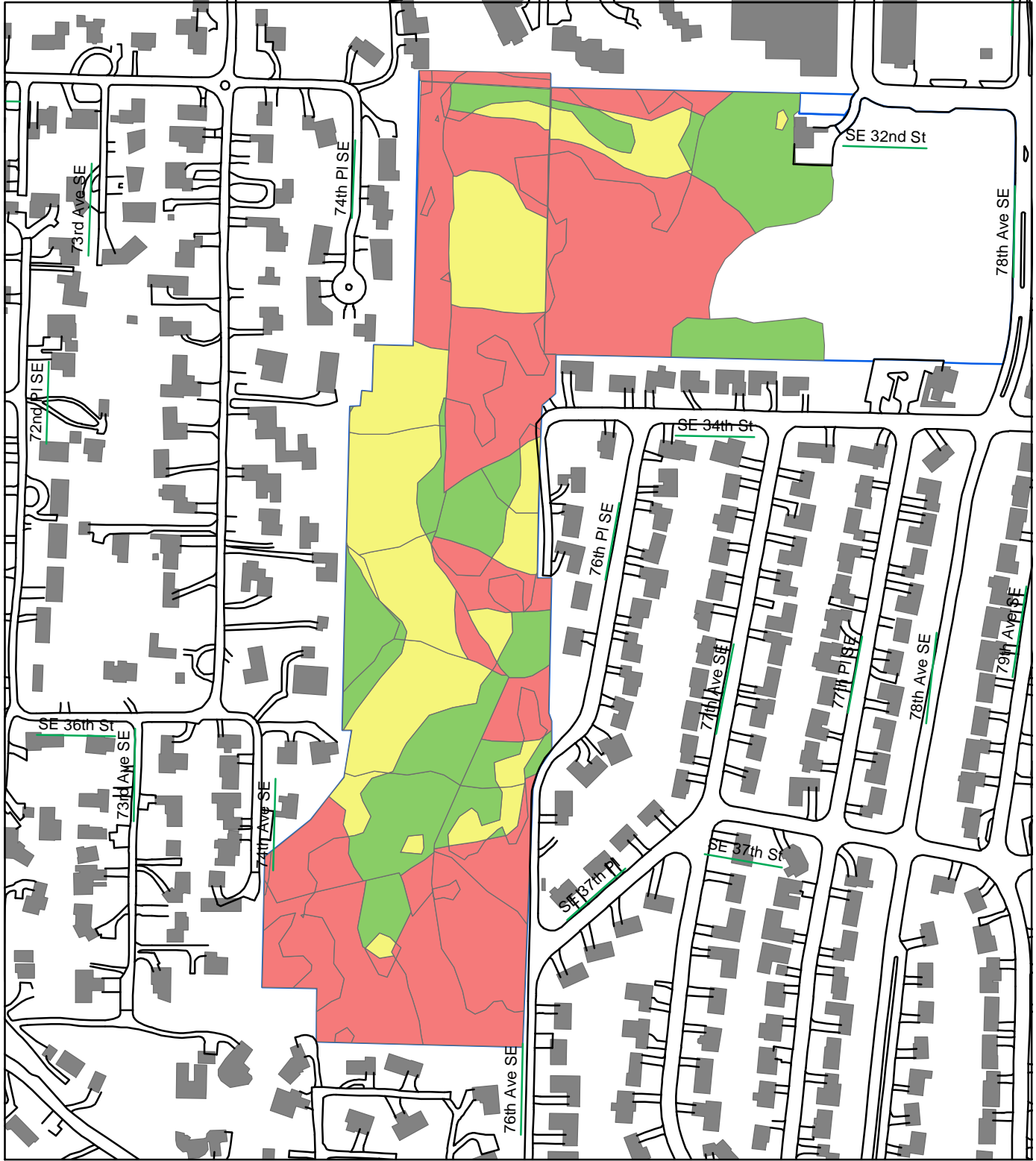
Park Name	Adjacent Land Uses: North	East	South	West	public ROW aesthetics	separates incompatible land uses	provides neighborhood privacy	Urban Design rating	Recreation rating
Homestead park	roadway	residential	school	roadway/residential	2	1	1	0.67	0.80
Island Crest Park	residential	roadway	residential	roadway/residential	2	2	2	1.00	0.80
Lincoln landing	shoreline	private shoreline	roadway	private shoreline	0	0	1	0.17	0.40
Luther Burbank Park	water	water	I 90 freeway	residential	2	2	2	1.00	1.00
Mercerdale Hillside	residential	openspace/residential	residential	residential, private openspace	0	0	2	0.33	0.80
Mercerdale Park	commercial	roadside/commercial	roadside/residential	city natural area	2	2	1	0.83	0.80
Miller Landing	residential	residential	residential	shoreline	0	0	1	0.17	0.40
North Mercerdale Hillside	roadway	residential	private open space	commercial (apartments)	0	2	2	0.67	0.60
Parkwood Ridge Open Space	Parkwood Ridge Road	roadway	residential	residential	0	0	1	0.17	0.20
Pioneer Park	residential	residential	residential	residential	2	2	2	1.00	0.80
Proctor Landing	residential shoreline	roadway/residential	residential shoreline	shoreline	0	0	1	0.17	0.40
Roanoke Landing	shoreline	shoreline	residential	residential	0	0	1	0.17	0.40
Roanoke park	roadway/residential	roadway/residential	residential	roadway/residential	2	2	1	0.83	0.60
Rotary Park	Residential	roadway	roadway	roadway	1	2	1	0.67	0.40
Salem woods	private	private openspace	private	roadway	0	0	1	0.17	0.00
SE 20th St Landing	private shoreline	residential landscaped gardens	residential	shoreline	0	0	1	0.17	0.20
SE 36th St Landing	residential	roadway	residential (old rail tram & stairway)	shoreline	0	0	1	0.17	0.20

Park Name	Adjacent Land Uses: North	East	South	West	public ROW aesthetics	separates incompatible land uses	provides neighborhood privacy	Urban Design rating	Recreation rating
SE 40th St Landing	residential shoreline	shoreline	residential shoreline	residential	0	0	1	0.17	0.20
SE 45th St Landing	residential	residential	residential	shoreline	0	0	1	0.17	0.20
SE 47th St Open Space	residential	residential	residential	roadway	0	0	2	0.33	0.00
SE 53rd Open Space	residential	roadway	residential	residential	2	1	2	0.83	0.00
SE 56th St landing	residential	private open space	residential	shoreline	0	0	1	0.17	0.20
SE 72nd St Landing	residential	lake shoreline	residential	city development	0	0	1	0.17	0.20
SE 80th Open Space	residential	residential	residential	residential	0	0	2	0.33	0.00
Seashore Dr. Lndg	residential	residential	waterfront	waterfront	0	0	1	0.17	0.20
Secret Park	residential	roadway/residential	roadway/playfields	residential	2	1	2	0.83	0.40
Slater park	residential	roadway/residential	residential	shoreline	0	1	1	0.33	0.40
South Mercer Playfield	School	roadway/residential	school	residential	1	2	2	0.83	0.80
South Point	residential	residential shoreline	shoreline	residential shoreline	0	0	1	0.17	0.20
Tract A	residential	roadway	residential	residential	1	0	2	0.50	0.60
Upper Luther Burbank Park	I-90 Freeway	private open space, SF residential	SF residential	roadway	1	2	2	0.83	0.20
					0=none	0= none	0= none		0= none
					1= minor	= minor buffering	fewer than 5 houses		1= undevelop
					2= major (arterial)	= major buffering	more than 5 houses		2= mini
									3= neighborh
									4= communit
									5= regional

OPEN SPACE VEGETATION PLAN APPENDIX E:				
MERCER ISLAND PARKS AND RECREATION VOLUNTEER PROJECTS				
LEVEL OF SERVICE AND ASSIGNMENT OF RESPONSIBILITIES				
L.O.S.	Parks & Recreation Responsibilities	Project Organizer Responsibilities	Activities that do not require special approval	Optional resources
A.	P&R will provide staff time to fully plan the project, including site meetings, logistics coordination, promotional assistance, etc.	PO will insure participation of a minimum of 25 volunteers for at least 3 hours	tree planting	sandwich boards, downtown park sign, Reporter calendar item, flyer to the neighborhood,
	P&R will provide hospitality including table, chair, clipboards, and refreshments to supplement what the PO is able to recruit	PO will recruit sufficient leaders to achieve a minimum of 1 trained leader for every 10 volunteers on-site during the project	shrub planting	canopies and banners from P&R, Starbucks, local supermarkets will donate to community groups
	P&R will deliver and retrieve the volunteer tools trailer and first aid kit	PO will assign min. one volunteer to organize hospitality and recruit donations of refreshments	invasive removal (all types)	additional tools can be borrowed from parks, trucks, equipment+operator,
	P&R will provide at least one staff person to assist on-site for the duration of the project, and will assign other staff if available	PO will insure that sign-in sheets are completed and returned to P&R Volunteer Coordinator	work on critical areas (wetlands, streams, slopes over 30%)	Earthcorps or other agency can provide professional project staffing at \$35/hour
	P&R will provide debris pick up during or after the project as necessary	A trained leader will perform safety orientation prior to project work	repair of minor landscape features (boardwalks, paths, benches, etc.)	
	P&R will provide an open restroom or sanican at the site			

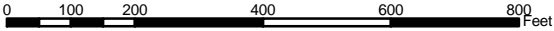
L.O.S.	Parks & Recreation Responsibilities	Project Organizer Responsibilities	Activities that do not require special approval	Optional resources
B.	P&R will provide limited staff time to plan the project, usually limited to phone conversations but may also include a site visit as staff time permits	PO will insure participation of a minimum of 10 volunteers	invasive removal (all types) in non-critical areas	trained leaders may have special qualifications (Native Plant Steward, Trail Leader, etc) to assist with project planning
	P&R will deliver and retrieve the volunteer tools trailer and first aid kit	PO will recruit sufficient leaders to achieve a minimum of 1 trained leader for every 10 volunteers on-site during the project		participant can bring personal tools; (volunteer may not use power tools)
	P&R will assign one staff person to be at the project for the first hour to assist with project start-up	PO will insure that sign-in sheets are completed and returned to P&R Volunteer Coordinator		Earthcorps or other agency can provide professional project staffing at \$35/hour
	P&R will provide limited debris pick up after the project	A trained leader will perform safety orientation prior to project work		
	no comfort facilities provided			local homes or businesses may allow use of restrooms
C.	P&R will provide minimal staff time to review and approve the project by phone	no minimum for participation	cutting ivy on trees	trained leaders may have special qualifications (Native Plant Steward, Trail Leader, etc) to assist with project planning
	P&R will lend tools to participants who arrange for pickup and return at the City's Maintenance Shop during normal business hours	PO will insure that a trained leader has reviewed the project in the field with the project organizer prior to the project	litter pick up	participant can bring personal tools; (volunteer may not use power tools)
	P&R will <u>not</u> provide debris pick up after the project unless prior arrangements are made	PO will insure that sign-in sheets are completed and returned to P&R Volunteer Coordinator		
	no comfort facilities provided	PO will recruit a trained leader to perform safety orientation prior to project work		local homes or businesses may allow use of restrooms

Open Space Vegetation Plan: removal of invasive plants Mercerdale Park and Hillside

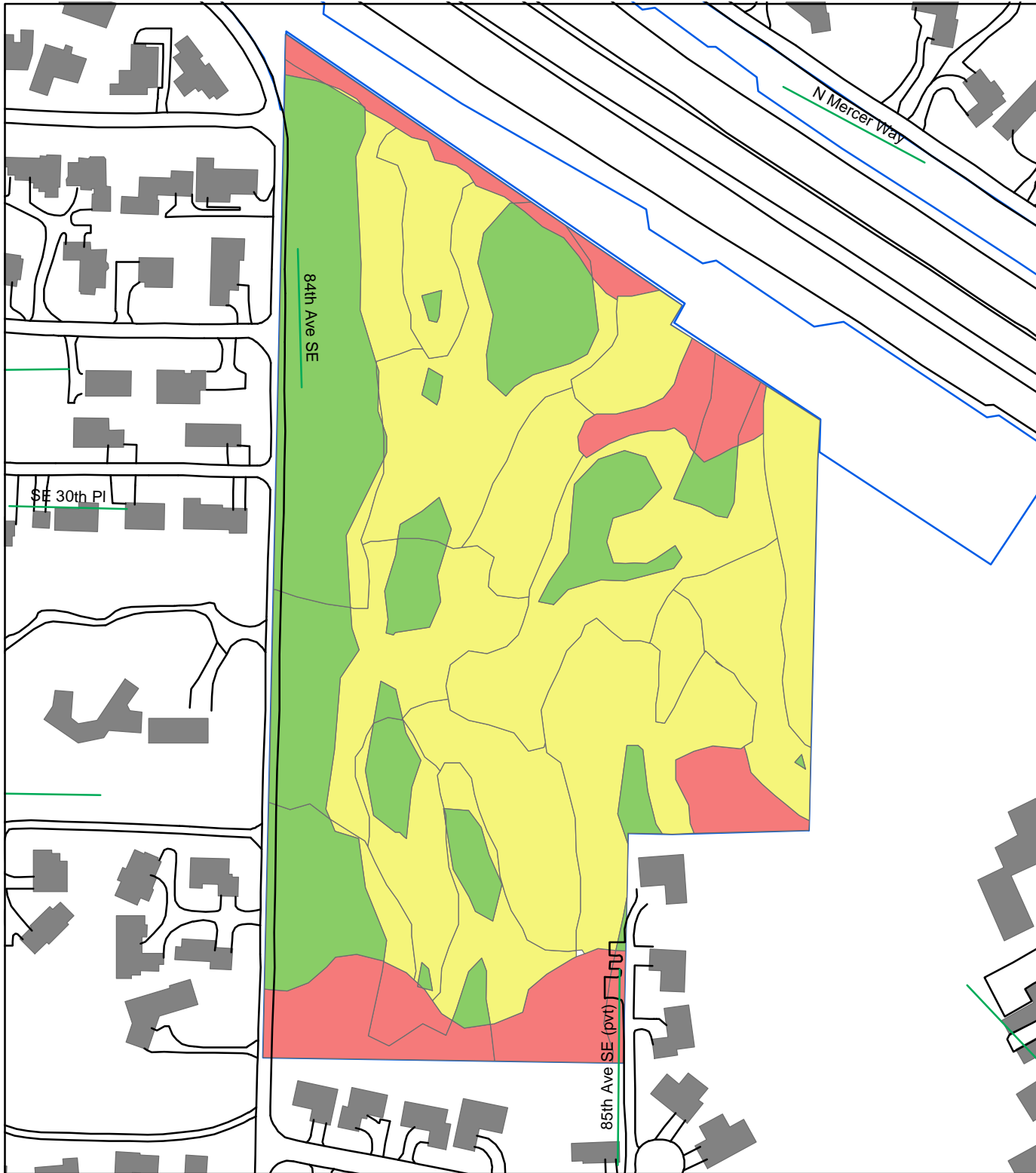


Task Areas

- non-selective removal
- selective removal >30% slope
- selective removal <30% slope

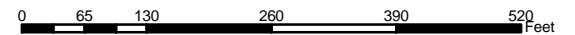


Open Space Vegetation Plan: removal of invasive plants Upper Luther Burbank Park






Task Areas

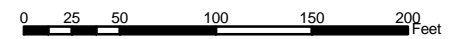
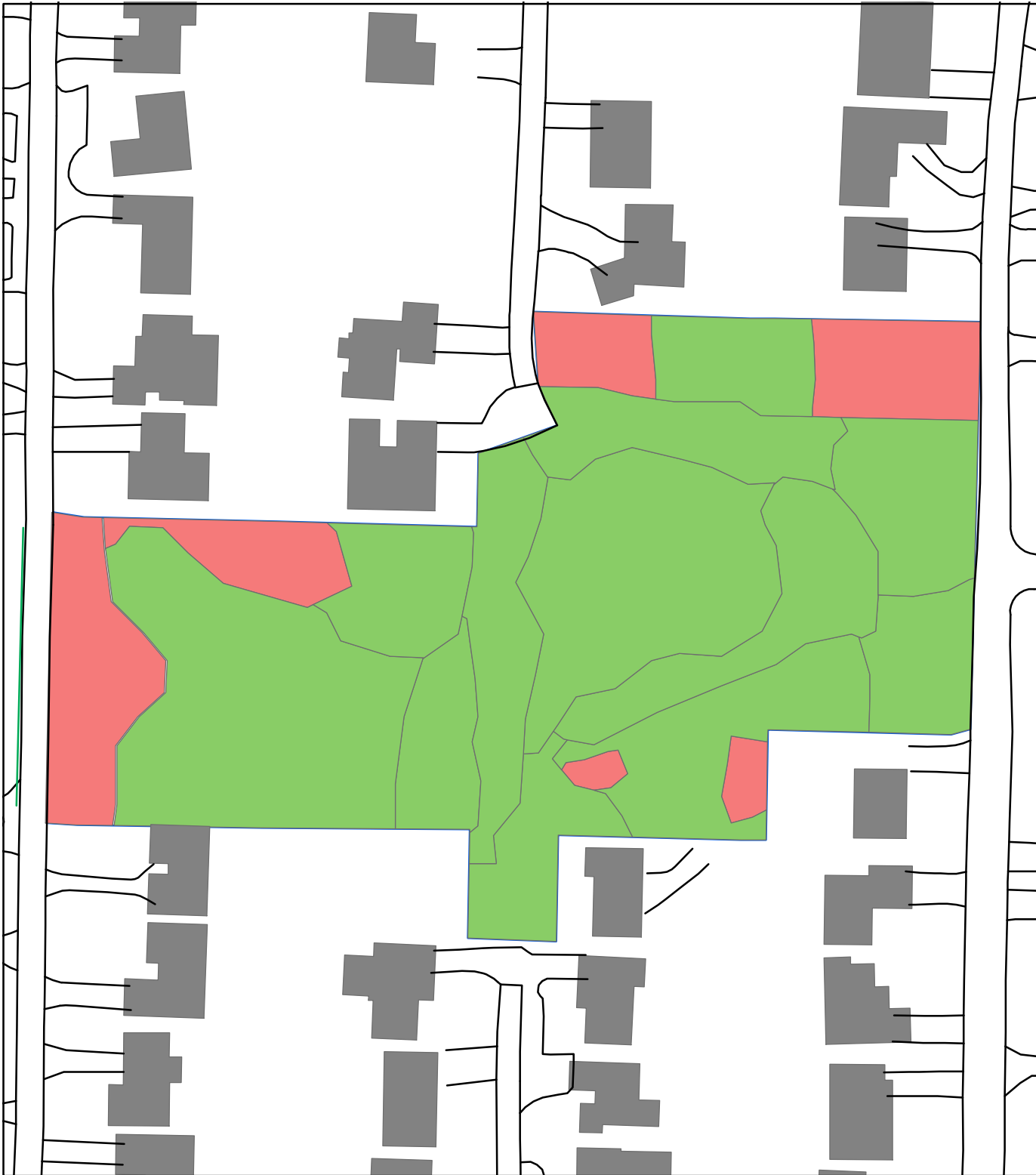
- non-selective removal
- selective removal >30% slope
- selective removal <30% slope



Open Space Vegetation Plan: removal of invasive plants Ellis Pond




Task Areas

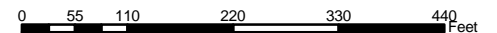
-  non-selective removal
-  selective removal >30% slope
-  selective removal <30% slope



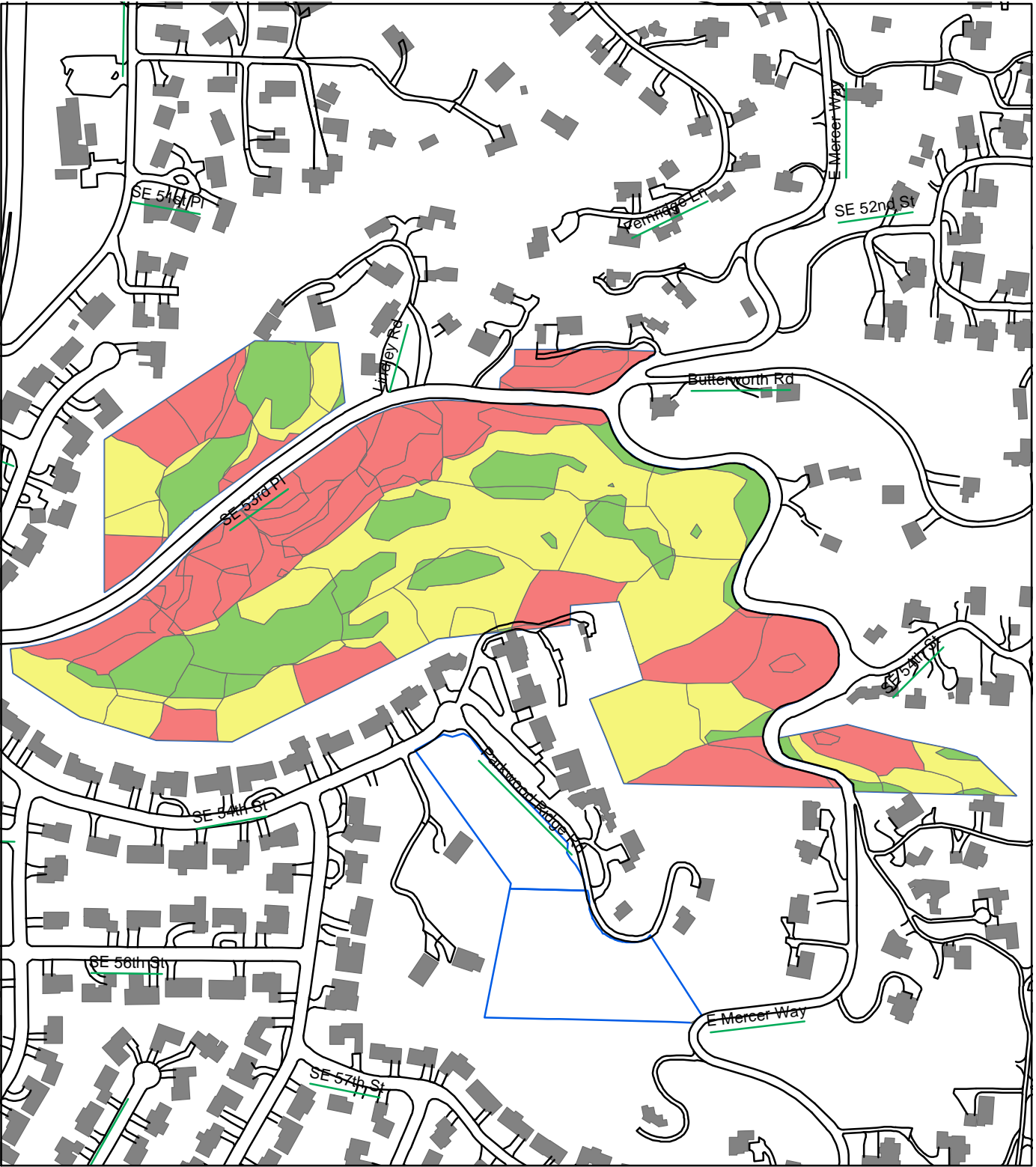
Open Space Vegetation Plan: removal of invasive plants Island Crest Park

Task Areas

-  non-selective removal
-  selective removal >30% slope
-  selective removal <30% slope

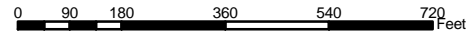


Open Space Vegetation Plan: removal of invasive plants SE 53rd Place Open Space



Task Areas

- non-selective removal
- selective removal >30% slope
- selective removal <30% slope



**Open Space Vegetation Plan Appendix G:
Review of Public Input Meeting and
Pursuant Topics for Discussion**

**June 3, 2004
City of Mercer Island**

Review of Public Input Meeting:

The first of two public input meetings for open space vegetation management was held on Thursday, June 3, 2004 at the Mercer Island City Hall. Thirteen members of the public attended. Upon arrival, attendees were asked to sign in and were given a packet consisting of a two-part questionnaire and histograms illustrating the quantitative and subjective values of each park and open space on Mercer Island.

Paul West, Park Arborist for the City of Mercer Island, organized and led the meeting. He gave a presentation which briefly covered the quantifiable (air pollution abatement, storm water buffering, and erosion control) and subjective (habitat, urban design and recreation) values of parks and open spaces and identified each site's relative value. Throughout the presentation, some questions were brought up by attendees such as: what was the design of the model used to create the histograms; concern for how specific parks rated in relation to others; and why we were considering parks individually and not treating all acres of open space alike. Following the presentation, the attendees were given time to fill out the second part of the questionnaire regarding the importance of each quantitative and subjective value to them. The values which were designated as having the highest concern among attendees were habitat and erosion control (weight=1). Storm water buffering, urban design and air pollution abatement ranked second (0.9) and recreation value ranked third (0.8).

The presentation was followed by a group activity in which the attendees were asked to prioritize the parks/open spaces where they would manage vegetation. On a map of Mercer Island, the attendees put a green dot sticker on those parks/open spaces that they favored. During this activity, Pioneer Park (25 dots) Luther Burbank (15) and South Luther Burbank (13) were assigned the highest rating. After the green dots were in place on the map, each attendee was given the opportunity to explain their perspective and attempt to persuade others to consider their site(s) of interest. Some topics brought up were:

- Should we consider small parks on equal ground as larger parks?
- Should we consider whether parks already have funding for invasive plant removal?
- Should we restore first what is in the "best" shape (i.e. least amount of invasive species)?
- What are the priority issues (eg. ivy up trees, blackberry understory)?
- Should we choose areas of visibility for invasive species removal to serve as a model for other people to take action?

Following the discussion, each person was told to put 10 red dots on the map to re-assign a priority for parks that they think are in need of management. While there was a change in the distribution of dots, Pioneer Park (19) still was ranked the highest. Concern for South Luther Burbank (16), Mercerdale Hillside (15) and SE 53rd Open Space (13) increased while in some parks the number of dots decreased. For example, Luther Burbank (6) and Homestead Field (1) decreased from 9 and 4 dots respectively. In general, following the discussion, the red dots were more distributed to smaller parks and open spaces than the green dots were prior to discussion. This change in distribution is likely due in part to the discussion which included a call for focusing on smaller parks, and for allocating more effort to those parks with less existing funding. In addition, one attendee left the meeting before the red dot locations were chosen. Therefore, there are 10 less red dots in total than green.

Analysis of data from the model weighted by attendees' responses to the questionnaire indicates that Pioneer Park, Island Crest Park, SE 53rd Open Space and Mercerdale Park and Hillside were all considered to have the greatest collective benefit. Overall feedback from the attendees was positive. People engaged with each other, and generally agreed that more people should have attended.

Follow-up Questions:

In order to proceed with open space vegetation management, there are a number of questions which must be addressed. Some of these questions are:

1. What are our priority issues – Do we want to focus on managing forest health and function in certain parks/open spaces or work on particular issues (e.g. controlling specific invasive plants) in all parks/open spaces?
2. Should park values be weighted by park/open space size?
3. Should we focus on parks/open spaces that are in best or worst shape in regards to the extent of invasive species prevalence?
4. Do we focus on parks/open spaces that are not receiving funding at this point?
5. Do we focus on parks/open spaces that are not relatively accessible to volunteers (i.e. too steep; too dense)? If sites are being maintained by volunteers at this point, can we count on continued volunteer effort?

In this section, the five above questions and the benefits and negative consequences associated with each issue are briefly discussed.

1. **Priority Issues:** *Do we want to focus on managing forest health and function in certain parks/open spaces or work on controlling particular invasive plant species in all parks/open spaces?*

The benefit of managing forest health and function in certain parks or open spaces is that there is increased potential for some of the ecological functions and structure of those particular sites (habitat, native biodiversity) to be restored simultaneously. Efforts

can be concentrated on areas that are known to have high ecosystem values and be used to enhance benefits such as habitat and recreation where they are known to be greater than others (recall that habitat was ranked highest by attendees of the public input meeting as the benefit of concern). In addition, it is likely that the amount of time required to restore sites will be shorter since the work crews in an area can remain on that site and not have to relocate between locations.

Focusing efforts on a small number of parks and open spaces does have negative consequences, however. It limits the scope of progress to those particular areas and presents a risk that the other areas may be increasingly exposed to invasive plants. There are a number of problems that might be presented by removing all invasives simultaneously from a small number of parks and open spaces. First, while many of the ecological functions are restored with the removal of all invasives, some functions such as erosion control, storm water buffering, and air pollution abatement may decline over a short term until native plants recolonize the site (or are planted and given time to grow). An additional negative consequence is that opening up an entire understory through the removal of all invasives (especially plants such as ivy and blackberry which form a monotypic understory) also increases the potential for more invasive plants to recolonize the site through seed or sprouts of existing propagules.

2. Size of the Park/Open Space: *Should values be weighted by park/open space size?*

Choosing parks/open spaces to focus efforts on may be influenced by the size of the sites. There are positive and negative consequences of incorporating size into decision-making.

It is often argued by conservation biologists that the larger the tract of land preserved, the greater the implications of the preservation will be. Larger parks/open spaces tend to have higher habitat diversity within them. For example, Pioneer Park (approximately 118 acres) and SE 53rd Open Space (which approximately 26 acres) are characterized by intact stretches of native upland forest and riparian forest which serve as habitat to a large variety of native birds and mammals that require large tracts of land for survival. Restoring the native vegetation to these sites will reintroduce native food sources to these animals and the structure that was inherent to these sites prior to invasive species introduction. Furthermore, analysis of ecosystem values which incorporates park/open space on a per-acre basis into a model indicates that the larger parks such as Pioneer Park continue to have the highest levels of quantifiable and subjective benefits even when minimizing size as a factor.

On Mercer Island, there are several smaller parks that contain a habitat that is rare or valuable to the Island. For example, Ellis Pond, which is only four acres in size, consists of highly-diverse palustrine scrub-shrub and palustrine forested wetlands which are unique to that site. The wetland system offers a refuge to amphibians and birds which rely on aquatic environments for survival. Neglecting to manage these sites may

endanger the unique habitats which characterize them.

3. Degree of Invasive Species Prevalence: *Should we focus on parks/open spaces that are in best or worst shape in regards to the extent of invasive species prevalence?*

At the first public input meeting, one of the attendees mentioned that restoration efforts are best spent on areas that are not yet characterized by a high concentration of invasive plants. She argued that protecting those sites when the invasive species are at a manageable level will limit the amount of effort that is required for future maintenance. Invasive plants often have a lag phase during which their density is manageable and they can easily be eliminated from a site. There are limited propagules at this early point to recolonize sites from which the plants are removed. With this consideration, focusing on sites with lower invasive plant establishment is favored.

It is important to recognize, however, that invasive species spread is not limited to the park/open space of which it is a part. Seeds of the major invasive plants on Mercer Island (ivy, blackberry, and holly) are dispersed by birds, which often fly between parks. Therefore, controlling invasive species in one park is likely to affect the dispersal of those plants to other sites. By controlling plants in sites where it is highly concentrated, its spread to other sites may be reduced.

4. Funding: *Do we focus on parks/open spaces that are not receiving funding?*

A couple of Mercer Island's parks currently receive funding for forest management. Pioneer Park receives \$50,000 a year and Upper Luther Burbank receives \$15,000 a year, much of which is dedicated to invasive species control. At the meeting, it was argued that since these parks currently are funded for forest management, further money should not be dedicated to their maintenance.

On the other hand, the two parks mentioned are relatively large, have diverse landscapes, and significant levels of invasive species (despite ongoing effort to control them). It is likely that putting additional effort into those parts with existing funding can enhance the native diversity of those sites and increase the chance of success for restoring forest health and function.

While there is currently funding available for some parks, in the long term, funding may be reallocated or removed. The purpose of the open space vegetation management plan is to provide a basis for determining where resources are needed. It is important that all parks and open space are considered without prejudice. The overall values of the parks should play the greatest role in determining the degree of management.

5. Cooperating with Volunteers: *Do we focus on parks/open spaces that are not relatively accessible to volunteers? If sites are being maintained by volunteers at this point, can we count on continued volunteer effort?*

Volunteer efforts are currently being made to clear invasive plants from some parks on Mercer Island, such as Clise Park and Pioneer Park. For example, “ivy-out” volunteers have been working at Clise Park for the past year and a half to remove ivy from the understory and trees. Continuing to focus efforts on those parks that are currently being maintained by volunteers has both positive and negative consequences.

One of the significant benefits of working in areas that are currently being maintained by volunteers is that the reinforcement of volunteer efforts will reduce the City resources required to clear a park of invasive plants and maintain the habitat’s structure. Such cooperative efforts provide a terrific opportunity for the City’s residents to become involved in habitat management and their efforts may provide a sense of stewardship. Another benefit of working in parks/open spaces that are currently being managed by volunteers is that volunteer efforts are not consistently reliable. Therefore, parks may only periodically be maintained or coverage may be incomplete. Relying on volunteers to maintain highly diverse parks or those with unique systems and failing to employ professionals to control invasives in those areas may therefore be detrimental to vital sites.

A negative consequence of focusing the City’s efforts in sites that are maintained by volunteers is that there are likely other important habitats on the Island that are currently being neglected. It might be more effective to spread the work out throughout the Island so that progress is made to eliminate invasive species in multiple sites.

In addition, there are limitations to the number of areas where volunteer efforts are beneficial. Selective removal of invasive plants from native vegetation requires care and skills that make it unsuitable for large groups of unskilled volunteers. This type of work is well suited to small groups of trained volunteers and landscape professionals. On the other hand, there are many opportunities for unskilled volunteers to assist in invasive species control. For example, without much training volunteers are quite capable of cutting down stands of blackberry or ripping up carpets of ivy. The available volunteer resource may be underutilized if selective control is the only method of invasive plant control.

Another factor that should be considered in determining if efforts should be concentrated in sites that are not maintained by volunteers is safety. Concern was expressed by attendees at the meeting that there are sites where volunteers would not work because it is too steep or dense. At these sites, landscape professionals may be the only option for accomplishing work.

Next Steps:

Decisions based on the above discussion will soon be made by Parks and Recreation staff. A follow-up public input meeting will be held on Thursday, June 17th at the Mercer Island City Hall. At this meeting, staff will present the results from the first round of public input and participants will comment on proposed management priorities, based on the results of the initial meeting. Decisions based on the outcome of the two meetings

will be used to determine in which parks and open spaces vegetation monitoring and management will be allocated.

**Open Space Vegetation Plan Appendix G:
Notes from the 2nd Public Meeting
June 17, 2004
Mercer Island City Hall**

7:15pm start time

Meeting led by Paul West

19 attendees (including 5 City employees, 1 newspaper reporter)

Topics discussed

1. Nuke vs. Weed:
 - a. You lose more good habitat with many small invaded areas (that can be weeded) than you do with one larger area that is invaded (that needs to be “nuked”).
 - b. It is less expensive to manage invasives in small areas that can be weeded than in large areas that need much more replanting. Larger infestations need more revegetation since the invasive species are well established in those locations.
 - c. Where is the breakpoint between “nuke” and weed?
 - d. You run the risk of increasing erosion if you need to nuke (increased runoff).
 - e. Question: When weeding, does time spent on saving natives through weeding balance out the removal of invasives?
 - f. It is difficult to control invasives in areas that that have been nuked.
2. Vegetation management on steep slopes
 - a. Earthcorp’s recommendation is to plant native vegetation in holes of a stand of invasives, especially on steep slopes. Some attendees argue that planting in holes is not maintainable.
 - b. One attendee pulled all invasives on a steep slope and left the woody debris present. Argues that it was effective and did not cause erosion.
 - c. Ivy is not good at erosion control.
3. Factors of concern
 - a. Attendee asked why stormwater buffering and air pollution are factors included in analysis. Expressed concern that by incorporating those two factors, we are answering the wrong questions. When considering these two factors, invasives are just as good as native plants.
 - b. Another argues that invasives can bring down trees and therefore affect the factors.
 - c. The factors play out differently for different parks.
4. Management tasks

- a. Attendee expressed concern as to why weeding invasives from the native understory is so low and believes that the importance of weeding the understory needs to be better explained. Invasives in the understory limit natural regeneration.
- b. Riparian management – How many year-round creeks are there on Mercer Island? Some attendees argue that there are many more than thought.
- c. Comment: Excellent job ranking management priorities.
- d. Attendee expressed belief that there is a need to map areas throughout the Island which need specific management (e.g. ivy on trees) regardless of where the problem(s) exist. Treat areas equally regardless of park name. The technique of tackling certain problems will be more useful than focusing on all problems in one area.
- e. Who will replant steep slopes from which invasives are removed?
- f. Since there are limited resources, we need to prioritize where to put our effort – certain areas or tasks?
- g. Question: Do you see all tasks being done on one park being accomplished in less time than one task being done in all parks?
- h. Recommendation: Put \$-sign next to all tasks on list (per acre cost)
- i. Regarding erosion as first priority: Rita Moore extends an invitation to come to a ravine by her home. There is a greater than 45° slope. From this slope, invasives were removed and she found no increase in runoff. The forest canopy is intact and there is still debris in the understory. Paul requested that Rita record what she did on the site.
- j. Regarding understory removal: If you don't revegetate on slopes after invasive species removal, you won't get much revegetation naturally. Also, there is concern that you need to restore the understory to enable the restoration of forest functions.

5. Volunteerism

- a. Accomplishing tasks can be tied to volunteerism.
- b. Recommendation to get students to “own” a tree – taking ivy off trees is very rewarding. It is good for volunteers to do. Maybe put a tag with the volunteer's name on the tree.
- c. From a volunteer standpoint, having people remove ivy from trees is more likely to be successful than removing it from the understory.
- d. Students can be encouraged to do ivy removal as part of their volunteer program in school. Great way to get volunteer hours.
- e. Paul suggests that this topic be in the plan as an option for management.

6. Areas NOT to remove blackberry from (from which it is gathered).

- a. Clark Beach
- b. Groveland Beach
- c. South Mercer Playfield

7. Forest regeneration

- a. Question: Has revegetation been considered? It is an important factor to manage for. Objectives should include enabling regeneration: “Forests die from the ground up”.
 - b. Selectively weeding the understory needs to rank higher.
 - c. Question: How can you get trees to regenerate if you don’t clear invasives from the understory?
8. Limited funds
- a. In regards to prioritizing how to use limited funds, some attendees agree with assigning tree canopy maintenance a high priority, but we need to get to the next step. Plan now for the future generations.
 - b. In an urban environment, we will always have invasives. Need to do what we can to encourage a naturally-functioning habitat.
 - c. In the short term, removing ivy from trees is most important. But possibly in the long term, removing ivy from the understory is most important.
9. Attendees would like to be updated about progress. If they signed in, they are on a mailing list.

Approximately 9:00: Meeting ends