WHI Mitigation and Enhancement Subcommittee
2/29/2012

Update Table 1: Approximate Habitat Impacts, Restoration and Costs

	City Shallow Water Habitat[1,2,6]	Port SWH[15,22]	City Wetlands[1,2,3,6]	Port Wetlands[16,22]	City Forest/ Woodland[1,2,3]	Port Forest[17]	City Shrub[1,2,3]	Port Shrub[18]	City Grassy/ Sparsely Vegetated[1,2,3]	Port Grassy Sparsely Vegetated[19]
Habitat Impacts and Mitigation (approximate acreages)										
Existing Habitat	170		45		480		25		230	
Impacted Habitat[4]	Total = 1 Terminal = 1 Recreation = TBD	*0.34* *TBD*	Total = 10 Terminal = 10 Recreation = <1	*10.5* *TBD*	Total = 140 Terminal = 138 Recreation = 2	*125.3* *TBD*	Total = 5 Terminal = 5 Recreation = <1	*21* *TBD*	Total = 125 Terminal = 123 Recreation = 2	*93.8 barren weedy fill* *TBD*
Mitigation Ratios[5]	2:1 – 5:1	*1:1 - 3:1*	2:1 – 3:1 [7]	*1:1 - 6:1* [16]	2:1 – 3:1	*1:1*	1:1	*0:1*	1.2:1	*1:1 for grassland*
Mitigation Needed	2 - 5	*est 0.34 - 1*	20 - 30	*est 27.8* [16]	280 – 420	*500 acres protection, plus enhancement*	5	*0*	150	*TBD*
On-Island Habitat Mitigation Opportunity[4]	195		35		340		18		100	
On-Island and Off-Island Mitigation (approximate acreages)										
On-Island Habitat Mitigation[9]	2 - 5		20 - 30		340		0 [8]		0 [10]	
Off-Island Mitigation[9]	0		0		80		0		150 [10]	
On-Island Surplus Habitat	190		15 - 5		0		18		0	
Mitigation Cost Estimates[19,20]										
Mitigation Costs/sq ft	$22.50 - $66.00 [11, 12]	*$41.32*	$3.20 - $45.00 [11, 12]	*$1.15 -$6.90*	$1.35 - $10.00 [13]	*$0.32 - $1.20*	NA	*$0*	$0.17 - $1.00	*$0.23*
On-Island Mitigation Costs	$5 M [14]	*$600k - $1.8M*	$3.5 M [14]	*$1.4 - $8.3*	$1.7 M over 30 yrs	*$9M Protection*	NA	*0*	$0	*TBD*
Off-Island Mitigation Costs	$0		$0		$23.3 M	*Enhancement Projects*	NA	*0*	$1M - $6.5M	*0*
Total Mitigation Costs	$5M	*$600k - $1.8M*	$3.5 M	*$1.4 - $8.3*	$25 M	*TBD*	NA[9]	*0*	$1M - $6M	*TBD*
OS Valuation					$4 M	$9M				
OS Credit					$22M off-site - $4M OS Value = $19.3 M off-site					

1. Shallow water habitat includes the area below ordinary high water (20ft NAVD88) that was mapped as wetland, forest, woodland, shrubland or grassland in the Hayden Island Natural Resources Inventory based on August 2010 aerial photography. This does not include area within the main river channel as mapped based on August 2010 aerial photography.
2. The floodplain overlaps all habitat types; the floodplain is not reported separately.
3. In the case where wetlands overlap forest, woodland, shrubland or grassy/sparsely vegetated lands, wetlands supersede for the purpose of calculating mitigation needs.
4. Acreages based on the Worley Parsons Final Base Concept Plan, previously called A2 (February 2012).
5. Subject to further discussion. There is disagreement about what the ratios should be. These are intended to provide a ballpark of how much mitigation may be needed.
6. Final mitigation for the shallow water and wetland impacts would be determined by a state and federal process with City participation, which would involve a more specific assessment of functional impacts and the amount of functional lift provided by the specific mitigation proposed.
7. The Port Mitigation Wetland will likely be impacted by development. Mitigating for a mitigation wetland usually carries a higher ratio. In addition, the mitigation wetland is breeding ground for red-legged frog, which could impact the ratio as well.

8. The City is not proposing to require shrubland mitigation. Shrubby vegetation would be included within the forest area enhancements and therefore the costs is captured in the forest mitigation costs.
9. The City used the higher ratio to determine mitigation needs on and off-island.
10. The City suggests that all mitigation for impacts to sparsely vegetated/grassland areas be performed on Government Island because A) much of the grassland mitigation opportunity areas are also where recreation is likely to occur; and B) coupling WHI mitigation with Airport Futures mitigation would take advantage of economies of scale.

11. The upper range of the costs includes actions like removing groins or encountering unexpected material underground (e.g. boat hulls or burial grounds). The lower range includes costs for excavating sandy material.
12. Markups include engineering, permitting, etc. and can vary a great deal depending on the complexity of the project.
13. Forest enhancements like removing invasive and planting native plants would be included in the low range. The upper range would include actions like amending the soil.
14. Using the highest ratio and the lowest cost estimates
15. Estimates do not include dock shading impacts. The Portland Harbor Feasibility Study places estimates for in-water mitigation at $1 to $2 million per acre. A local bank is selling in water credits for approximately $1.8 million per acre.
16. Wetland mitigation ratios are: Restoration 1:1, Creation 1.5:1, Enhancement 3:1, and mitigation for the mitigation site is 2 * ratio. This results in a mitigation commitment ranging from 12.5 acres to 42.5 acres. Costs range from $50k/acre to $300k/acre for construction costs or local mitigation banks ($150-180k/credit). There are no local banks available at this time within the service area (assume local credits would be in the range of $200 to $250k/credit). A conceptual mitigation project includes 22.7 acres of restoration (1:1) plus 5.1 aces of enhancement (3.1). A specific project would match impacts and regulations and methods at the time of development.
17. Cost estimates are based on a recent project on Government Island tree planting project estimate for $14k/acre.
18. The Port has not identified any costs associated with Shrub habitat due to the fact that the impacted habitat is predominantly blackberries and other invasives. In addition, this type of habitat has not been a requirement of City mitigation in the past to our knowledge.
19. Grassland cost estimates are derived from the first phase of the Airport Futures Government Island grassland project. This project is costing $500k/50 acres over 8 years. It is difficult for the Port to discuss the "Grassy Sparsely Vegetated" type since this is not an NRI category. No grassland was present in the City's NRI data. The Port's NRI also does not show any grassland in the development footprint. The Port is interested in restoring existing grasslands on the island.
20. Port costs do not include land costs, on-going maintenance, compliance costs, or other on-going costs such as security, property management, and the like.
21. Port costs are in today's dollars
22. A conceptual mitigation project for state and federal compensatory mitigation for wetlands and shallow water habitat impacts. The construction cost estimate was approximately $7M. Estimated operating, maintenance, and compliance monitoring costs for the resulting site are estimated to be $110/year.
23. Advanced mitigation needs to be creditted