Matthews Beach Restoration Project Proposal

Compiled by Rebecca Deehr, Derek Beauchemin, Liz Thorsenson, J. Katie Barndt, Jennifer Habetler, Doug Schmitt, Nathan Sakes, Lena Jones, and Suzy Karl

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INTRODUCTION

A successful restoration project requires balancing the needs of the group responsible for the restoration with those of the general public. At the Matthews Beach restoration site, the public is composed of several different groups including homeowners in the surrounding area and other visitors who may come from farther away to access the park.

To address the concerns of all parties, we determined the following goals:

- Provide or improve wildlife habitat and use native plants per the Seattle Department of Parks and Recreation's Urban Wildlife and Habitat Management Plan
- Preserve the basic functionality of the restoration site (i.e., keep the overall design, with its previous goals intact)
- Increase the functionality of the stream as a salmon nursery
- Provide access to the waterfront for the public
- Take the restoration project to "the next level" by dealing with problems that have arisen, and providing a long-term maintenance plan
- Provide education about restoration, native plants, fish & wildlife habitat and ecosystem health
- Preserve views where possible

To achieve these goals we concentrated on six areas. Our focus for this project has been primarily on the areas west of the small creek and main pond. The remainder of the site has more mature vegetation, and the only recommendation we are making at this time is the removal of invasive plants.

Areas of focus:

1. Drainage
2. Access
3. Defined areas
4. Improved salmon/wildlife habitat
5. Educational component
6. Safety issues

SITE HISTORY

Matthews Beach Park was originally owned by John G. Matthews, who homesteaded the property in the 1880's. The beach was under water until the Army Corps of Engineers built the Hiram M. Chittenden locks, which lowered Lake Washington. The park is bordered by the Burke-Gilman trail, which was the once the path of Northern Pacific Railways tracks. The property south of the beach was used by Pan American World Airways as offices and docks for their amphibious commercial airplanes, the Clipper Ships, in the 1930's and 1940's.

In 1951 the city purchased the first ten acres from Matthews and built the beach in his honor. In 1996 the City of Seattle and the Army Corps of Engineers joined together and developed the plan for the south end of the beach.

ORDINANCES/RESTRICTIONS

Matthews Beach is a relatively young site, which falls under a number of jurisdictions.

Army Corps of Engineers:
When the Army Corps of Engineers lowered Lake Washington in 1915, Matthews Beach was exposed. The juvenile salmon mortality at the Thornton Creek delta was attributed to lowering the lake and therefore the Corps responsibility. The Corps began habitat restoration in 1998, including adding native plants and creating ponds for juvenile salmon.

Thornton Creek Watershed:
As the delta of Thornton Creek, a salmon-bearing creek, into Lake Washington, regulations exist concerning water quality entering and exiting the site. The City of Seattle monitors bacteria and temperature levels onsite.

Washington Shoreline Management Act:
The location within 200 feet of a lake larger than 20 acres places Matthews Beach under the Washington Shoreline Management Act (1971). The WSMA focuses on water and habitat quality and preserving public access to shorelines.

Seattle Parks Department:
The City of Seattle Parks Department Matthews Beach for human safety, managing plants and monitoring trees to remove hazards, while maintaining public access to Lake Washington.

Additionally, vegetation management plans of city parks should:

- "Avoid fragmenting the appearance and ecological function"
- Phase large-scale tree removal to lessen habitat impacts
- Minimize the amount of time an area remains unvegetated
- Improve wildlife habitat
- Focus on native vegetation in undeveloped areas
- Control non-native, invasive vegetation
- "Minimize long-term maintenance requirements"
  (City of Seattle 060-P 5.6.1, Effective June 1, 2001)

As a public park, plans must follow regulations from the Americans with Disabilities Act (ADA).

OUTREACH

Public input by the neighbors of the Matthews beach site has been an important aspect of our steps toward improving the site. The neighbors of Matthews Beach have many opinions and valuable insights as to what they would like to see happen to this site.

It was our goal to reach as many people as possible to learn their opinions of the site and gain feedback on our site plans. We accomplished this goal in two stages. The initial stage involved

canvassing the neighborhood, going from door to door, asking the neighbors to comment on the site and what they liked or disliked about the site now and the site as it has changed over time. The second stage involved distributing flyers to the neighbors of Matthews Beach, which included preliminary information and a schematic plan of our group's assessment and plan for the site. Neighbors replied to this flyer through email responses.

Initial stage comments can be characterized as follows:
1. Approximately 45% of neighbors liked the site as a "natural" area (e.g. plant species diversity in contrast to the grassy lawns of the neighboring larger Matthews Beach park). They appreciated plant variety and the environmental benefits gained from such plantings.
2. Approximately 45% of neighbors disliked the site as a "natural" area and would like it to be returned to grass. They saw the open grass character as opportunity to increase access to the site for recreation, increase access to the shoreline of Lake Washington, increase views from their homes to the water, and increase public visibility for site safety.
3. Approximately 10% of the neighbors were indifferent to the site plantings, but were encouraging toward efforts to improve site elements, such as pathways, signage, etc.

The second phase comments were fewer than the initial stage comments, however, several people commented on how they appreciated our efforts at requesting feedback and input from the neighbors. They appreciated our inclusion of their involvement in the future plans of the site. In particular, we received specific design response comments from one neighbor, Ints Luters, a landscape architect who works for Jones and Jones of Seattle. We also met as a group with City of Seattle Department of Parks and Recreation point persons working on the site for comments, suggestions, and feedback.

As a result of our public outreach, approximately fifteen neighbors were involved in giving comments and feedback. We have tried to incorporate these ideas into our design response to the Matthews Beach site by including them wherever possible. We critically evaluated each comment and tried to respect the value of these responses, though we also realize it is impossible to please everyone.

Abstracts

EXISTING PLANT MATERIAL
Existing plant material analysis is divided up into the following sections:
Thornton Creek
Lake Washington Shoreline
Street Trees
Restoration Vegetation:
Wildlife transition zone
Shrubby wetland
Emergent wetland
Lists and descriptions of all plants are given for each section in the full report.

SOILS ANALYSIS

The soils at the Matthews Beach restoration site are generally a sandy loam, with a layer of clay reached at approximately 13 inches with sand found below this layer. The clay layer severely affects the drainage of the area. The percolation test results showed that water moves through the soil very slowly and visual inspection revealed standing water in some areas. Soil pH was normal (6.2) in the crescent planting area adjacent to the lawn, but was higher around the northern-most pond (7.2), which will need to be lowered using acidic mulches. Phosphorus and potassium are found in adequate levels, but nitrogen levels are low. The cation exchange capacity in both soil samples was relatively low, indicating sandy soil. Continuing the application of organic mulches is recommended. Soil compaction does not appear to be a problem at this site.

Nutrients (ppm)[1]						
	Nitrogen (NO3-N)	**Nitrogen (NH4-N)**	**Phosphorus (P)**	**Potassium (K)**	**Magnesium (Mg)**	**Calcium (Ca)**
Pond	7	6	9	94	280	1760
Crescent	4	4	8	73	299	943

1. ppm = parts per million

		Percent Base Saturation (ppm)[1]		
	Cation Exchange Capactity	**Potassium (K)**	**Magnesium (Mg)**	**Calcium (Ca)**
Pond	9.5 meq/100g[2]	2.1	20.3	77.7
Crescent	8.1 meq/100g	2.1	26.7	51.4
Ideal[3]		2-5	12-18	65-75

1. ppm = parts per million
2. meq/100 g = milliequivilants/100 grams
3. for growing crops

HYDROLOGY ANALYSIS

The Matthews Beach area has a high degree of easily saturated soils due to the nearness to Lake Washington and the poor soil conditions (see soil analysis). Before the lowering of Lake Washington by 12 feet due to the installation of the Ballard locks in 1917 this site was completely under water. There are two active creeks on site acting as physical boundaries, Thornton Creek to the North and Maple Creek to the South. Maple Creek flows North through a series of three artificial ponds and drains into Thornton Creek. Thornton Creek flows easterly emptying into Lake Washington. Both creeks had pH levels considered acceptable for Seattle urban creeks. Ocular velocity measurements showed a dramatic difference between low flows and the high flows seen following heavy precipitation. The site's boundary to the West/Northwest is 51st Ave. N.E. and during heavy precipitation events has become a runoff accumulation zone, thus becoming a potential access hazard for pedestrians. The turf area between the trail and 51st Ave. has a very poor drainage regime with surface accumulation occurring during large precipitation events. The amelioration of this problem is a major focus of this project.

LIGHT AND SEASONAL ANALYSIS

Partial shade/partial sun properties exist on site, as well as several microclimates. Water distribution is also one of the largest concerns, and changes during each season. Due to seasonal rains and a high water table, much of the area experiences flooding in fall, winter, and spring, while summer brings about drought in this same space. Matthews pond has the highest average temperature for all seasons, and lowering of pond temperature is desired. Other areas will be planted based on light levels, soil types, hydrology, and other factors.

DESIGN NARRITIVE

1. Drainage

During heavy rains the lawn becomes saturated and its functionality is reduced for park visitors. The standing water is also a problem for the trees located at the edge of the lawn, and parts of the lawn are sinking. The plants in the crescent planting strip surrounding the lawn are also affected by the standing water. The reduced drainage will severely limit the plant choices available to the restoration team. Each plant will need to be screened for the ability to tolerate moderately saturated soil conditions. The full report outlines three options for improving site drainage.

2. Access

The park currently has three main areas where access is provided: the lawn, the main pathway through the park, and the path across Maple Creek out onto the beach. Access across Maple Creek to the beach is dangerous due to stepping stones that are uneven and slippery when wet; these will be replaced with larger, flat stones. There are also numerous social paths constructed by park visitors that cause damage to the existing plants. We plan to extend a formal path to Thornton Creek, helping to direct foot traffic to specific areas.

3. Defined areas

There are several locations in the park that may be improved by more clearly defining boundaries. Some of these areas include:

- *Crescent planting area around lawn appears "weedy" and plants are declining*
- *Park entrance undefined*
- *Invasive species, particularly in area east of the small creek*

4. Salmon/Wildlife Habitat

Part of the initial restoration of the site included the creation of a series of ponds within Maple Creek, which reduced the overall velocity of the creek. The creek's functionality for salmon habitat will be improved by providing shade around the northern-most pond, which will reduce the water temperature. Besides salmon, the park also attracts a number of bird species whose habitat can be enhanced.

5. Educational component

A major part of making a restoration project work is gaining public acceptance, a project best done through education. Currently there is no onsite educational component for this park. Providing information that answers the question "why does this section of Matthews Beach look

so different from the rest of the park?" would improve public understanding and acceptance of the restoration project. Information should be provided on topics such as salmon habitat, native plants, and the need for ecological restoration.

6. Safety

Since this is a public site, safety issues are a concern. There are several areas that need to be addressed as a matter of public safety:

- *Several trees on the edge of the lawn are unhealthy (possible root rot) due to standing water.*
- *Poor placement of trees (i.e., under power lines)*
- *Tree hazards such as dead branches and snags*

PLANT SELECTION

The goal for the plant selection of the Matthews Beach site is to combine the aesthetic desires for the space with the limiting environmental factors to create a sustainable landscape. First, definite edges throughout the entire site will be created. Second, a shaded shoreline for Matthews pond will be established. Finally, plants will be selected to improve the overall visual interest of the site without encroaching upon the views of the Matthews Beach community. When selecting new plant installations, community input and environmental factors have to be taken into consideration for optimal success. The most significant environmental challenge this project faces is the issue of water. Topography combined with soil conditions and a high water table makes this site prone to seasonal flooding. Thus, plant selection will concentrate on aesthetics, border definition, shade for Matthews pond, and seasonal flood tolerance.

SITE PREPARATION

The Matthews Beach site requires several steps in site preparation before proposed plans can be implemented. Site preparation requires four main steps:

- *Removal of specified existing plants and specified structures*
- *Re-grading and relocating specified earth for proper site drainage*
- *Control of erosion and sedimentation*
- *Protection of existing plants on site.*

INSTALLATION

The Matthew Beach site is divided into four sections: lawn area, Matthews pond, crescent planting area and the Southern strip. For plant placement information, refer to the Plant Placement Outline in the full report. The installation section details the list of materials, apparatus and procedure for each aspect, including the four planting areas listed above, foot bridge, path to Thornton creek, bench at terminus of the path, low point for drainage in grassy area and berm.

AFTERCARE AND MAINTENANCE

The plants for the Matthews Beach site were all chosen for their minimal maintenance needs and their ability to survive and thrive in the Pacific Northwest climate. All plants chosen will require

very similar and simple maintenance regimes. None of the trees chosen should be pruned at the time of installment unless there are damaged limbs. After the installment pruning should only be done on plant branches that are dead or damaged, have crossing limbs, or present a hazard to visitors. The lawn will require occasional mowing and periodic watering during the dry season. All the beds should be mulched regularly to suppress any weed seeds that may have been on site, ensure a soil moisture minimum for the establishing plants and alter the pH favorably for the more acidic loving plants. Care should be given when applying the mulch around the plants to keep a mulch-free area within a 1" radius around the each plant base. This helps prevent excess moisture or disease from damaging the plant material. There were plants selected such as the sword fern and salal which will act as "living mulches". During the first year or until the plants become successfully established they should be monitored for any sign of water stress, such as leaf wilt or slower than normal growth. During this first year the perennials will require the most attention in terms of water to ensure success.

Site Plans

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The UW Students who wrote this report