

Restoration Design

Lab/Studio Design Assignment 7

Assigned 30 & 31 May 2007

Due 4 Jun 2007

Overview

The scenario for this week's Lab/Studio exercise is that your team is working with a local environmentally concerned citizen who is unusually (amazingly) wealthy and has become particularly interested in restoration in and around Thornton Creek. Thornton Creek is an urban creek in Seattle that drains the largest watershed of any creek in Seattle (12 sq mi). It includes 18 miles of creeks and tributaries (15 numbered and named channels and tributaries).

Your friend has recently started quoting heavily from some historical information that was taken from a Wikipedia entry:

Stream Loss and Restoration in Seattle

Seattle was settled by Europeans in the [1850s](#), and developed in an uneven boom through the turn of the century to c. [1910](#).^[3] [Surface runoff](#) increased with the nearly complete removal of forest cover during this time, [Lake Washington](#), [Lake Union](#), and typical small post-glacial [Green Lake](#) were lowered in the 1910s. Streams were increasingly buried with post-World War II growth (1948-1964).^[4] Dramatic declines in water quality of [Lake Washington](#) and other lakes in the later [1950s](#) was partially corrected by the implementation of sewage treatment in the [1960s](#).^[5] Popular awareness of natural environments became significant in the 1960s and 1970s, and with that came nascent ideas about daylighting. [Thornton Creek](#), the largest [watershed](#) within metropolitan Seattle was the first of many gradual daylighting projects. A model of an urban stream came from nearby [Greenwood](#), south [Broadview](#), and northeast [Blue Ridge-North Beach](#) neighborhoods, whose [Pipers Creek](#) was spared [Carkeek Park](#) by steeper geography and the early establishment of the park boundaries (1926-1929), despite initial opposition by city government.^[6] Since 1990 and earlier,^[7] years of hard work by neighbors and volunteers have brought [salmon](#) back to [Pipers](#)

Creek after there were none for 50 years. Along with abruptly high volume during storm runoff and resulting [turbidity](#), water quality is the remaining big issue in restoring salmon.^[8] Partly following the successes with daylighting Thornton Creek, [Ravenna](#) and surrounding neighborhoods have daylighted part of [Ravenna Creek](#).

The results of daylighting efforts on Thornton Creek have been mixed. Heavy rains, at times, has led to flooding due to inadequate [detention basins](#). Soap suds, oil slicks, and species kills have occurred occasionally as the visibility of streams leads to heightened awareness of stream water quality. Increased levels of [fecal coliforms](#) in Thornton Creek counts has been a recurring problem and has been variably attributed to pets and wildlife such as grazing birds. The number of [spawning coho salmon](#) has remained modest dropping from a high of 30 to 10 in 2000.^[9]

Through your own research you have discovered that the Thornton Creek Alliance began creek restoration efforts in the 1990's and that, over time, small projects have had an incremental but meaningful effect. Salmon have moved back into the system as far north as Twin Ponds, at 155th St. NE, next to I-5. Seattle Public Utilities and the City of Shoreline continue to support the restoration of sections of the creek system. Recently plans were made public for the re-development of a creek segment that would have flowed under the south parking lot of the Northgate Mall.

Your Assignment:

First, you know to be skeptical of information garnered from Wikipedia.

Although Wikipedia can be a very useful place to begin to understand almost any topic it has the potential for being just plain wrong. However, a more likely problem than its being wrong is that it is not generally accepted as credible and your wealthy friend seems to be undermining the group's credibility by citing it all the time (you've been in the meetings so you've seen the smiles). Determine the validity of the statements that your friend is quoting from and provide her with some better citations.

Second, your group needs to guide your friend in developing a priority list for future work in and around Thornton Creek.

On a map, identify all of the restoration projects that have been completed or are in the planning stage, anyplace along Thornton Creek.

Identify several decision making criteria for your group to use in developing the priority list. List and carefully define the criteria (they could include potential size of restored parcels, environmental value, cost, closeness to completed restoration projects, etc.). Review the decision matrix approach that was discussed earlier in the quarter and determine weighting factors to use with the various criteria. Also determine a method that you will use to score the possible (or proposed) restoration projects on something like a 1-5 or 0-10 scale.

In careful consideration of the projects that you have identified (on a map), propose four new sites, or sites that would be modifications or re-working of existing restoration projects. The sites may be in-stream, lake or pond, riparian vegetation, connection corridor, adjacent forested watershed, or whatever else you perceive as providing an important improvement in the environmental functions provided for and by Thornton Creek.

Use a decision matrix to evaluate the proposed four sites (projects) and evaluate them using your criteria. Once you've completed the evaluation apply the weighting factors and arrive at a prioritized list (with numeric scores).

List the constraints that would need to be considered during design for any of the four sites. Divide these into two lists: "site" or "biophysical" constraints and "stakeholder" constraints

Make a simple plan and profile of your highest priority site to help you describe and explain what you would propose to do to restore it.

Related web sites:

Ravenna Creek Alliance

<http://home.earthlink.net/~ravennacreek/index.htm>

Thornton Creek Alliance

<http://www.scn.org/tca/>

Seattle Public Utilities creek restoration page

[http://www.seattle.gov/util/About_SPU/Drainage & Sewer System/Projects/Creek Restoration/index.asp](http://www.seattle.gov/util/About_SPU/Drainage_&_Sewer_System/Projects/Creek_Restoration/index.asp)

Longfellow Creek Community

<http://www.longfellowcreek.org/>

Thornton Creek Tour

<http://www.scn.org/earth/tca/tcatour.htm>

Wikipedia: Thornton Creek

http://en.wikipedia.org/wiki/Thornton_Creek#_note-Walter

Homewaters Project

http://www.homewatersproject.org/pages/Resources/thornton_creek.html

Some Thornton Creek Restoration Sites:

Thornton Creek Restoration Sites Watershed Tour

The following sites were chosen to demonstrate how we have started with little or no features in sites and transformed them to become not only an amenity for the community but also habitat for wildlife.

1.) **Paramount Park Natural Area – NE 147th and 8th Ave NE**

This site was owned originally by Mr Littles. It was vacant, undeveloped land that was always wet, and overgrown with blackberry as well as other invasives. The Paramount Park Neighborhood Association, with Janet Way in leadership and with landscape assistance from Brian Bodenbach, obtained grants and support from the King Conservation District as well as the City of Shoreline to create a series of wetland ponds connected by a creek channel. They introduced Pacific chorus frogs which jumped in population initially, but has now plateaued.

2.) **Jackson Golf Course – NE 145th and 5th Ave NE**

Thornton Creek Alliance proposed this project and remained active in the master plan update process to encourage Seattle Public Utilities to create two new ponds and restore a third pond that had been used as a water storage area. It had been used for drawing water off the creek for irrigation. The creek channel was originally lined with large concrete blocks from the old corridor and trolley lines where I-5 now resides. Grass was planted right down to the edges of the creek. Today, the creek channel has been naturalized, native vegetation grows on its banks and woody debris adds to structure and habitat. Trout and beaver have moved in.

3.) **North Seattle Community College Wetlands – 1st Ave NE and College Way**

As a tradeoff for parking lot expansion, mitigation funds were designated to restore a wetland north of the college. Originally the site was grass covered fill, but ponds and

native conifers were added as a first phase. As the trees matured to provide more cover, native shrubs and smaller native plants were added. Hawks love to hunt for rodents in this site and Pacific Chorus frogs have populated the new ponds in large numbers. A wide variety of duck species can be found in the ponds in spring and fall. Beaver have now found their way into this site also.

4.) Northgate South Parking Lot - 5th Ave NE between NE 103rd & NE 100th

After a long, hard battle, citizens from Licton Springs, Haller Lake, Northgate, Victory Heights, Pinehurst, and Maple Leaf, and various environmental groups finally convinced Seattle City Council and Seattle Public Utilities that daylighting Thornton Creek was the better way to proceed than covering the creek with asphalt and parking garages. Three alternatives were considered, but a hybrid of all three was chosen by the Northgate Stakeholders Group to submit to Seattle City Council. It combines the existing underground pipe for peak storm overflow, a weir system that holds back peak storm levels and releases runoff slowly while dropping out sediments, and a water settling and filtering system near 5th Avenue NE. This system will clean water from the Northgate Mall, the south parking lot developments, and the Group Health and commercial area south of NE 100th, thus providing much more than just a daylighted creek could accomplish. *(Copies of the final plan will be available since this is the one site we don't have something on the ground to show you.)*

5.) Thornton Creek Park 6 – NE 105th & 9th Ave NE to NE 103rd and 5th Ave NE

Before Thornton Creek Alliance started working on this site as early as 1992, the entire site was covered in blackberry that had been growing since the late 70's when the site was purchased with Forward Thrust funds. Seattle Parks and Recreation sold some of the park to Pacific Medical Clinic in the 80's but a year ago they acquired a new parcel on NE 105th to the east of the existing park. Earthcorps, at the direction of Alan Johnson from Aquatic Resources Consulting, has been laying back the banks, adding woody debris, and replacing non-native plants with native species to allow the stream once again to replenish the wetland areas. Native trees and shrubs planted back in 1992 are now mature and filling in the park to make a more natural habitat for birds. This site boasts the largest crayfish in the watershed and has wood ducks that return every other year or so. Two frog ponds were constructed but nature took over by felling a couple trees over the ponds making them too shady for frogs, but ideal for ducks.

6.) "Rossi" Wetlands – NE 100th and 20th Ave NE

Houses built back in the 50's were over the creek and on the steep slope, filling in the wetland area the creek ran through and confining it against the base of the hill. As the owners reached retirement age, not wanting to deal any longer with the creek trying to move back into its benched wetland resulting in flooding, they sold their properties to Seattle Parks and Recreation and to Seattle Public Utilities. The houses were removed and native planting workparties are scheduled for this month. Seattle Public Utilities is working up a plan to remove the stone channel and restore the benched wetland, thus providing additional "off channel" fish habitat as well as addressing downstream flooding and erosion.

7.) Meadowbrook Wetlands – Between NE 105th and NE 110th, on 35th Ave NE

Before the community center was constructed, there was an empty field out behind Seattle Parks and Recreation softball and hardball fields. In 1992, Janine Van Sanden, a local landscapist and Landscape Architect Peg Gaynor had the vision and took the initiative to create a creeklet along the edge of the hill. They obtained one of Seattle's first neighborhood matching grants to plan and construct the creeklet only to find there was so much spring water that a series of small ponds formed to make a wetland instead. The creeklet was continued with a second matching grant to make the final connection to Thornton after the community center was completed. Since the wetlands are spring water fed, they stay cooler and provide rearing habitat for small salmon fingerlings and Pacific Chorus frogs who took up residence in the areas covered by Sitka Willow. Five years later, an old sewage transfer station across 35th Ave NE was converted to a wildlife habitat/flood control pond by Seattle Public Utilities after many public meetings. It extends the habitat connection which now provides homes to salmon, kingfishers, river otter, herons, shoreline birds, various types of ducks, killdeer and beaver.

8.) Sandpoint Natural Area – NE 95th and Sandpoint Way

A vacant lot on the north side of NE 95th was slated for development. All the trees were removed and grading had begun. Thanks to the tenacity of Joanne Ishisaka and her neighbors with support from TCA, she was able to get Seattle Parks and Recreation to acquire the parcels. They replanted the site with conifer trees and native shrubs. On the south side of NE 95th, Joanne and her supporters got Seattle Parks and Recreation and Seattle Public Utilities to remove a large concrete pad from an old gas station, then Earthcorps came in as did volunteers to replant with native vegetation. Today you

would never guess the sites were cleared. Three types of salmon come through Thornton Creek at this site: Coho, Chinook and Sockeye, as well as Cutthroat and Steelhead Trout.

9.) **Matthew's Beach – NE 92nd on Lake Washington**

The final reach of Maple Creek tributary was channelized and directed straight into Lake Washington as if it was a drainage ditch. Neighbors, Thornton Creek Alliance, Seattle Parks and Recreation, and the Army Corps of Engineers worked together to find a way to change the course of the creek, put meanders and woody debris into it, and provide safe passage for salmonids to and from Lake Washington. At the same time play space and views for homeowners had to be protected. A small pond was added to help salmonids escape Bass, and to protect the shoreline. Since then, the Beaver have built a dam which redirects high flows into the grassy meadow during winter when not in use....a perfect arrangement. Various techniques have been tested here to remove Japanese Knotweed from stream banks without causing undue erosion. Kingfisher and Heron use the site regularly.

