Duwamish Riverfront Revival

A Waterfront for Salmon and People in South Park

Environmental Coalition of South Seattle

July 2001

credits

The authors of this report would like to thank all those who have contributed to the Duwamish Riverfront Revival project:

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PEOPLE for PUGET SOUND

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1:01 background

In this ambitious project, ECOSS and numerous community partners are planning to improve salmon habitat along the Duwamish River from the South Park Bridge to Duwamish Park. The challenge is to develop habitat in a built-up urban environment with diverse landowners.

ECOSS initiated this project as a response to a need for more habitat restoration in cooperation with landowners. In the last few years, there have been significant habitat restoration projects in the Duwamish. In particular, the Hamm Creek/Turning Basin area and the Seaboard Lumber/ Kellogg Island area have had significant projects completed. However, these projects were chiefly done on government-acquired property with government funding. There are now fewer opportunities for government to buy land along the Duwamish for restoration. Most of the land that is left is being used productively for businesses and residences, so new habitat projects will have to be developed in and around these land uses. There is a need to develop a model for habitat projects that do not require major government land acquisitions, but serve as smaller "stepping stones" for out-migrating salmon. This project addresses this challenge.

The funding for this project has come from the King County WaterWorks program, the Hugh and Jane Ferguson Foundation, and a local South Park Family Fund. The project team consists of staff from ECOSS, Anchor Environmental, Jones & Jones Architects and Landscape Architects, and People for Puget Sound. We have had significant assistance from City of Seattle and King County staff as well as a cadre of "citizen planners" from South Park.

Charlie Cunniff, ECOSS

By bringing together residents, business owners, environmental groups, and local governments, ECOSS has helped create the coalition of landowners and interests necessary to make a restoration project of this size happen. These riverfront improvements will play a crucial role in the survival of salmon in the Duwamish River.

1:02 goals

The goals of the project recognize that this is an urban site on an industrial waterway. The historical conversion of the meandering Duwamish River into the dredged Duwamish Waterway has increased the separation between aquatic and upland habitat. The availability of preferred habitat for juvenile salmon, such as emergent marshes and intertidal mudflats, has been reduced 97 percent since 1898 (USACE et al. 1994, USACE 2000). The river valley has become a center of industry and home to many residents. Many of these industries use the federal navigation channel, which extends to river mile 5.2, 1.2 miles beyond the South Park project site. Our goals are to increase the quality and quantity of habitat for juvenile salmon, while maintaining the shoreline in a form that protects adjacent land use and allows full use of the navigation channel. Additional aims of the project are to provide permitting assistance to riverfront landowners and to develop limited public access to an improved South Park riverfront adjacent to the South Park Bridge.

Given the constraints of maintaining the navigation channel and the neighborhood, the size and scope of the project is somewhat limited. For these reasons, the restoration project will be considered more "enhancement of selected attributes" rather than "restoration to historic condition" (Shreffler and Thom, 1993). This is an appropriate goal given the high degree of urbanization of the site and the surrounding area. The attributes are focused on habitat functions supporting juvenile salmon. Juvenile salmon are particularly reliant on feeding and resting habitat that provides a safe haven from predators as they become acclimated to salt water on their journey out to Puget Sound.

process

The project began with an analysis of the project area and its context. The design team presented this analysis to a gathering of South Park residents and landowners and listened to their concerns and goals for the project. Alternatives were developed that illustrated a range of values and approaches. These alternatives were refined with a dedicated group of neighborhood "citizen planners" to a vision for the Duwamish riverfront that achieves significant juvenile salmon habitat improvement while respecting and enhancing the South Park neighborhood. Finally, implementation strategies dealing with funding, stewardship, permitting, and agency coordination were developed to realize the neighborhood vision. The site and context analysis, citizen planning process, riverfront vision, and implementation strategies were assembled in this report to describe the project and support further outreach. A well-attended barbecue was held on the riverfront to celebrate the completion of the conceptual design phase of the project and discuss the next steps toward making the design a reality.

2001 timeline

Task 1	Research & Reconnaissance	February 21–March 9
Task 2	Analysis	March 10–21
	Common Goals Workshop	March 21
Task 3	Alternative Plans	March 22–April 18
	Alternative Plans Workshop	April 18
Task 4	Draft Vision Plan	April 19–May 9
	Neighbors Charrette	May 9
Task 5	Community Vision	May 10–15
	Community Vision Meeting	May 15
Task 6	Vision Report	May 16–July 18
	Vision Report Presentation	July 18

vision & implementation

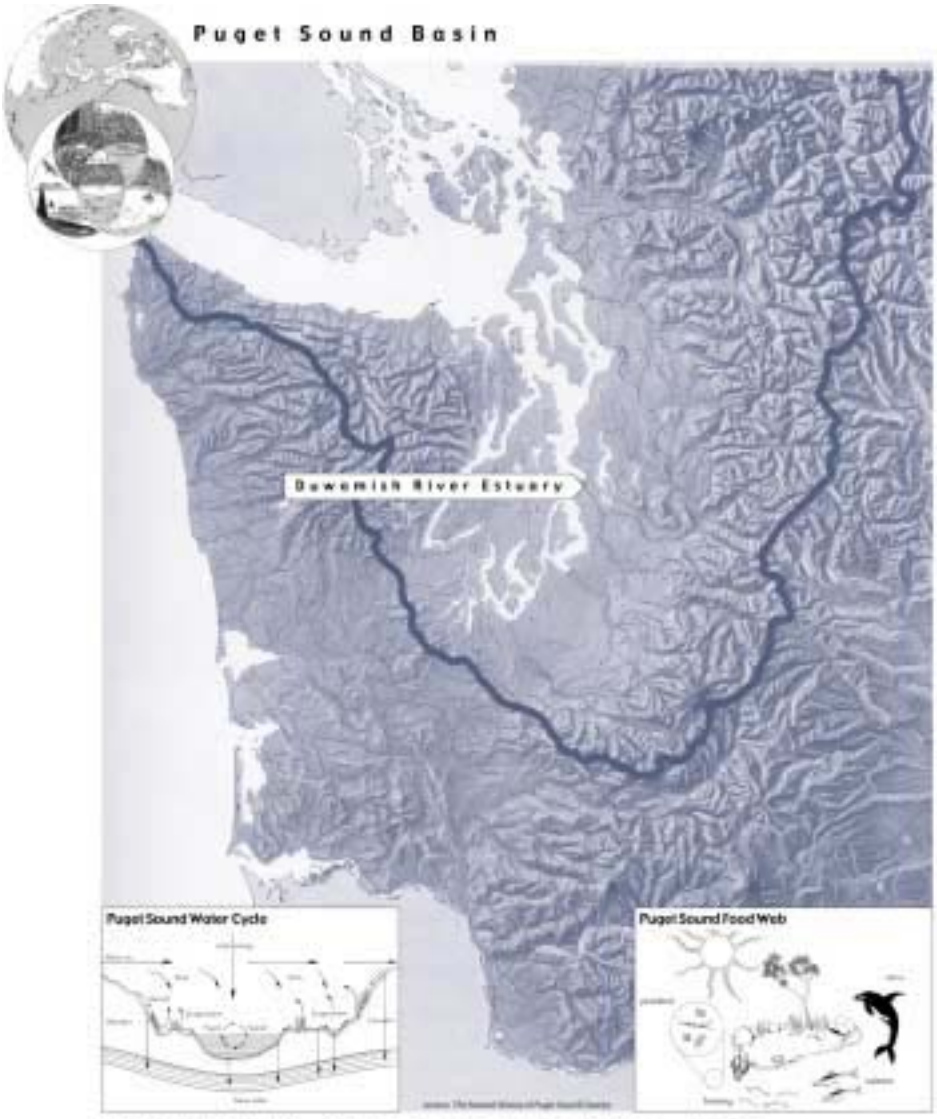
A conceptual model for achieving the goals of the habitat restoration guides the specific design interventions. This framework identifies the physical processes and environmental conditions, such as slope and elevation, that are the controlling factors for habitat structure and function. It then describes the habitat structures, such as estuarine marsh and sand/gravel substrate, that are defined by the controlling factors. Finally, it describes the habitat functions, such as food production and refuge from predators, that are defined by the controlling factors and habitat structure.

In response to specific existing controlling factors along the riverfront, especially slope and elevation, and the willingness to participate of adjacent landowners, a series of eight distinct "zones" were defined in the project area. A range of design and engineering approaches, such as marsh benches and cellular confinement systems, was assembled to improve the juvenile salmon habitat potential of these zones. Taken together the zones represent a living laboratory where the effectiveness of the different techniques will be able to be evaluated and compared. The project would create or enhance approximately 2.1 acres, nearly an acre of which would be in the upper intertidal range, and would increase the length of the shoreline by over 50%.

This riverfront vision will require continued cooperation to become a reality. This report outlines a series of implementation strategies to guide the project. The cost of the project is estimated to be around 4 million dollars. This report includes a funding strategy that lists potential sources of support ranging from government agencies that sponsor salmon recovery

to entities that may be seeking habitat restorations to settle natural resource damage claims. The project will require an informed and excited community to maintain the habitat restoration. This report includes a volunteer and stewardship strategy based on successful efforts on nearby restoration projects on the Duwamish. The project will trigger a number of permitting requirements. This report includes a permitting strategy that outlines the permits that will be required and the order in which they should be pursued. The project will need to be integrated into broader planning initiatives and phased to take advantage of available resources and opportunities over time. This report includes an agency coordination and phasing strategy that identifies the coordination issues and generally identifies the elements which should be developed in each phase.

Puget Sound Basin



Salmon Life Cycle

Incubation

Emergence

Freshwater Rearing

Estuary Transition & Rearing

Estuary Ocean Transition

Ocean Residence

Migration to Spawn

Spawning

Puget Sound—Where Land and Sea Meet

Puget Sound is a semi-enclosed, glacial fjord where saltwater from the ocean mixes with fresh water that falls as precipitation or drains from the surrounding land. Made up of a series of underwater valleys and ridges, Puget Sound is deep, with an average depth of 450 feet. More than 10,000 streams and rivers drain into Puget Sound. Puget Sound is surrounded by 2,354 miles of shoreline, which is a mosaic of beaches, bluffs, deltas, mudflats, and wetlands.

The waters of Puget Sound move in a typical estuarine pattern—seaward at the surface and landward at the lower depths. This circulation pattern is influenced by numerous factors, including the action of the tides, the configuration of waterways, and the presence of freshwater. The difference between high and low tide (from +11.8 to −2 ft MLLW) is nearly 12 feet at Seattle, significantly more than other estuaries. This results in a large amount of water moving in and out of the estuary with the tide.

The Puget Sound ecosystem boasts a diverse collection of habitats. The local marine environment alone supports more than 220 species of fish, 26 species of marine mammals, 100 species of seabirds, shore birds, and waterfowl, and numerous invertebrate and plant species. The vast food web within these habitats links the survival of the smallest plants and animals to that of the largest. Losing any one of the life forms in the web could also affect our own well-being. Much of the promise and potential of this region is based on natural resources and the industries, tourism, and recreation these resources support. While much of the Sound is healthy, rapid growth and development in the region are stressing the system. A steady loss of habitat and alarming declines in some fish and wildlife populations are signs that the very best of Puget Sound is threatened.

2:02 salmon's eye view of the estuary

What is an estuary?

The term estuary comes from the Latin *aestus*, the tide, and *aesto*, boil, from the boiling effect of the rising tide at river mouths where the river and ocean waters meet. The estuary is usually defined as that part of the lower river course that is affected by the mixing of salt water and fresh.

—*Encyclopedia of Geomorphology*

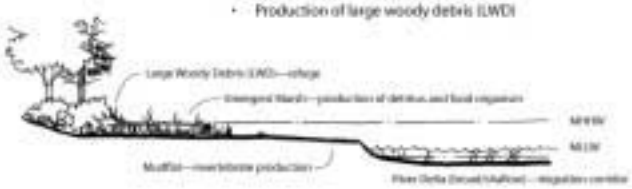
What is a juvenile salmon looking for in the estuary?

- **A Place to Adjust**—Juvenile salmon move to estuaries for weeks or months as they grow and adapt to salt water before moving out to sea. Here is where salmon make a critical transformation from a freshwater to a saltwater fish, a process called smoltification. Changes in body chemistry, appearance, and behavior occur. When salmon return from the sea as adults, they pause again in estuaries to adapt to freshwater before heading upstream to spawn.
- **Shelter in Shallows**—Because predators such as larger salmon and sculpins tend to avoid the turbid waters often found nearshore, these regions provide some protection for young salmon. Shallow tidal channels with eelgrass and fringing marsh plants offer places to forage and hide.
- **A Rich Food Web**—Juvenile salmon experience the highest growth rates of their lives while in estuaries and nearshore waters. A complex detritus-based food web provides rich and abundant prey. Food production by marsh plants, seaweeds, eelgrass, epiphytes, and sediment microalgae surpasses food production in open waters. Despite the vast range of prey items to eat, juvenile salmon are very selective. The food chosen by young salmon varies with the size and age of the salmon.

Before Development

source: King County DNR

- Evergreen/conifers and deciduous trees & shrubs
- Insect production
- Shade
- Production of large woody debris (LWD)



After Development

source: King County DNR

- Increased runoff
- Lack of habitat structure/refuge
- Lack of insect production/food

What can we do to improve estuaries for salmon?

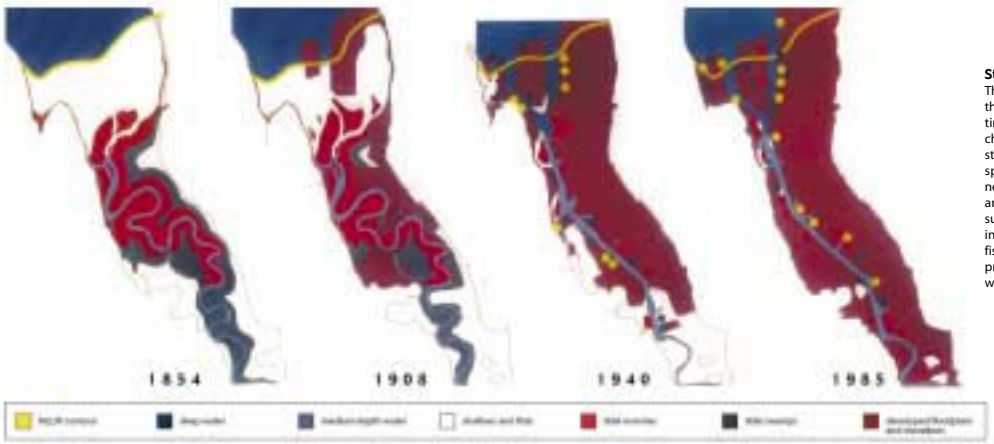
Above the top of the bank:

- **Plant overhanging vegetation in the riparian zone.** This will create food for salmon and increase woody debris deposition for food and refuge from predators.
- **Slow stormwater in vegetated swales.** This will improve water quality by reducing "Combined Sewer Overflows" and allowing sediments to settle before the stormwater reaches the river. These water courses will also collect and convey insects and nutrients to salmon.

Below the top of the bank:

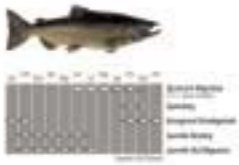
- **Reshape shoreline to create refuge and feeding areas in the intertidal zone.** Bowls, bays, sloughs, benches, coves, lobes, and side channels will provide suitable elevations and protection for estuarine habitat.
- **Replace portions of riprap and substrate** with materials such as rootwads and geotextiles that are more conducive to estuarine habitat.
- **Plant estuarine vegetation.** This will create food for salmon and provide them with refuge from predators and a place to rest during acclimation to salt water.

Duwamish River Estuary

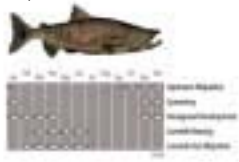


Duwamish Salmon

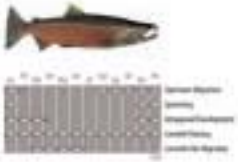
Chinook
Although there continue to be 5,000 to 12,000 chinook that are naturally spawning in the Green River and its tributaries every year, few are the ancient native chinook that once lived in the river. the reasons are varied. The availability of spawning and rearing habitat has steadily declined due to the construction of two upstream dams, modifications to the channels of the mainstem and larger tributaries, and loss of streamside vegetation. In addition, chinook produced at the Green River Hatchery on Soos Creek have strayed and been out-planted into the Green River, mixing and mating with the native fish. This mixed stock enters the river in the early fall, migrating to spawning areas in side channels of the mainstem and larger tributaries, especially Newaukum Creek. Puget Sound Chinook were listed as "threatened" under the Endangered Species Act in 1999.



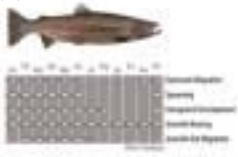
Chum
The native chum of the Green-Duwamish system spawned in the mainstem, sloughs, and major tributaries of the lower river. Because these areas have been channelized, dredged, and otherwise modified with the development of the lower valley, these native stocks are diminished and perhaps gone entirely. Most of the chum that remain in the system, which number as many as 1,500 naturally spawning adults in some years, are produced in the Keta Creek Hatchery on Crisp Creek and are descendants of fish introduced from Quilcene and Hood Canal stocks. While most adult chum are returning to the hatchery, there is a limited amount of natural spawning that occurs in the mainstem and Newaukum, Crisp, and Burns Creeks.



Coho
Like the chinook, the native coho in the Green and Duwamish Rivers have been greatly affected by loss of habitat and coho production at the Keta Creek and Green River Hatcheries. While as many as 12,500 coho returned to spawn in the river in the late 1960s, there have been fewer than 5,000 naturally spawning coho in the river in recent years, and the 700 spawners in the river in 1991 were the fewest on record. Extremely low returns to Newaukum Creek have led the Washington State Department of Fish and Wildlife to categorize the status of this stock as "depressed," indicating that the run size is low given the available habitat, but has not declined to "critical" levels, where permanent damage to the stock is likely. Coho return to the river from August to January, spawning and rearing in tributary streams.



Steelhead
The winter steelhead are the last of the true "ancients" of the Green-Duwamish system, isolated by geography, run timing, and management, to maintain their wild, native characteristics. Between 1,000 and 2,500 of the wild winter steelhead enter the river in December through May and spawn in the mainstem, lower Newaukum Creek, and nearby tributaries. In addition to the wild steelhead, there are both summer and winter steelhead stocks that are sustained by hatchery-produced smolts that are released into the river, but the high harvest rates (in tribal and sport fisheries) and different spawning times of the hatchery-produced fish minimize competition and interbreeding with the wild fish.



The Green/Duwamish River system is an important producer of fish and wildlife resources. Unfortunately, the system has also experienced significant degradation of its habitats, water quality, and ecosystem functions and processes. To date, 97 percent of the estuary has been dredged or filled, 70 percent of the watershed (and flows) has been diverted out of the basin, and about 90 percent of the floodplain is no longer connected to the river (Corp, 2000). The figure at left shows the path of the Duwamish River in 1894, overlain on a recent aerial photo. The large image and the series of small maps below it illustrate the historical sequence of habitat changes from 1854 to 1985. The transformation of the shallow, meandering river into a straightened, dredged waterway reduced the length and increased the depth of the channel, resulting in a reduced amount of habitat for juvenile salmon.

In response to these trends, two species of fish have been listed under the Endangered Species Act (ESA) as threatened and endangered species: chinook salmon (endangered) and bull trout (threatened). Ecosystem restoration is key to recovery of these fish species.

The Lower Duwamish River has also been the subject of activities to investigate the extent of sediment chemical concentrations that pose an unacceptable risk to human health and the environment. Based on an assessment of damages to natural resources, in 1991, the Natural Resource Trustees settled claims against the City and the former Municipality of Metropolitan Seattle (Metro). More recently, the National Oceanic and Atmospheric Administration (NOAA) evaluated the distribution of polychlorinated bi-phenyl in river sediments. Currently, a river-wide remedial investigation and feasibility study (RI/FS) is currently being performed by the City, Port, King County, and the Boeing Company. The US Environmental Protection Agency (EPA) has also proposed the Lower Duwamish River as a federal Superfund Site.

Together, these issues have ignited a number of efforts to improve the quality and quantity of aquatic and riparian (shoreline) habitat along the waterway. These efforts include a number of built habitat restoration projects. The completed projects are largely clustered upstream (Turning Basin and Hamm Creek) and downstream (Puget Creek Estuary and Seaboard Lumber) of the South Park project site. There is a long stretch of the waterway without habitat enhancement in the vicinity of South Park, making it an excellent location to focus on new habitat efforts aimed at improving this migration corridor.

Turning Basin

Hamm Creek

Puget Creek Estuary

Seaboard Lumber

The different species of salmonids (anadromous trout) that swim by the South Park neighborhood are shown at left. Juvenile Chinook and Coho Salmon tend to swim downstream in the spring and early summer (out-migrate), and adults generally move upstream in the summer and fall (Meyer et al, 1980; Weitkamp and Campbell, 1979; Taylor et al, 1999; Grette and Salo, 1986). Chinook juveniles spend a longer time in the estuary than Coho juveniles (Bostick, 1955; Weitkamp and Campbell, 1980). The wild Puget Sound Chinook Salmon (*Oncorhynchus tshawytscha*) inhabit the Green/Duwamish River and are listed as "Threatened" by the federal government under the Endangered Species Act (ESA). Juvenile, out-migrating salmonids are vulnerable as they enter the Duwamish Waterway because of their need to hide from predators in shallow water, feed, rest, and physiologically adjust to more saline water. Adults migrating upstream, on the other hand, tend to move through the waterway quickly and utilize deeper water. Therefore, the focus of this project is on habitat restoration that directly benefits the juvenile outmigrating salmonids and the ecosystem that supports them.

Urban Open Space & Circulation

Landmarks

Man did not weave the web of life; he is merely a strand in it. Whatever he does to the web he does to himself.

—*Chief Seattle*

South Park is a Seattle neighborhood bounded by the Duwamish River to the north and east, Highway 509 to the west, and the city limits to the south.

legacy (adapted from HistoryLink.org)

The first residents of South Park were Native Americans of the Duwamish tribe. For thousands of years, they lived in large cedar longhouses and took fish from the river, grew pototoes, gathered bulbs and berries, and hunted game. Beginning in 1851, settlers staked claims to the land. In last half of the nineteenth century, development and industry favored Georgetown, which left South Park to the farmers. By the turn of the twentieth century, Italians moved in to raise crops. Japanese farmers joined the Italians, and they all took their produce to Seattle. In July 1905, South Park voted to be a city of the fourth-class and in July 1907 voters approved annexation by Seattle. South Park's population was 1500.

South Park's character was changed dramatically when the Duwamish River was rechanneled, beginning in 1913. By 1920, the broad meanders had been straightened into a straight, deep channel that would accept ocean-going ships and barges. Industry began to develop along the banks of the waterway. Like the rest of Seattle, South Park experienced rapid and dramatic change during World War II. Boeing's Plant No. 2, just across the river at Boeing Field, as well as shipyards, attracted thousands of workers, creating a critical housing shortage. The little farming community was flooded with newcomers. Industry rapidly encroached and the fertile bottomland that had attracted early settlers and, later, Italian and Japanese farmers, was paved.

In 1956, the area was rezoned by the city council as "transition to industrial." A 1962 headline proclaimed, "South Park: A Square Mile of Defiance." In the mid 1960s, South Park was rezoned as industrial. Four thousand two hundred residents staged a protest at City Hall and got the zoning changed to low-density residential. Later, Highway 99 was rerouted through South Park, severing Concord School from the rest of the neighborhood. By 1974, crime was up and the area attracted mostly poor immigrants. The neighborhood hung on despite the pressures. In 1989, the City built a community center. By 2000, more amenities were built including the Sea Mar Community Health Center and a remodeled Concord School. South Park's low-priced homes within city limits began to attract buyers who improved their properties. This invited retail businesses but also tended to drive up rents and taxes, putting pressure on older, low-income residents. By 2000, about 3700 people lived in South Park, about 50 percent of them white, 37 percent Hispanic, and 13 percent Asian and Pacific Islander. About 40 percent of the residents are property owners. The median age is just under 31 years.

opportunity

The riverfront addressed in this project, between Duwamish Waterway Park and the historic South Park Bridge, is the first view of the neighborhood that one sees when one enters South Park by crossing the bridge. A restoration project in this highly visible location would have a significant impact on the perception of South Park by its residents and visitors. In spite of limited resources, land use pressures, and a diverse population this community is making a bold environmental statement.

South Park has limited habitat and open space resources. Most of the neighborhood is close to the river. A public access at the South Park Bridge would be within a very short walk of the emerging retail core of South Park along 14th Avenue South and would be only a few hundred feet from the likely location for the new South Park library. The focus of the project is on improving habitat for juvenile salmon, but there is an opportunity to create a wonderful civic place from which to observe the restoration and inspire further neighborhood activism.

challenges

While most of the South Park neighborhood is within the City limits, a small piece of land referred to as the "sliver on the river," bounded by Dallas Street to the west and the river to the east, is part of unincorporated King County. This remnant is probably a relic of jurisdictions established before the dredging of the waterway and filling of an oxbow channel that Dallas Avenue once paralleled. Residences on this unincorporated land have never been connected to a sewer system, and there have been discussions about the extension of City services as part of an annexation, but the issue of annexation is tied to larger and more expensive questions- whether to repair or replace the failing South Park Bridge, which technically connects a small piece of Tukwila and this small piece of unincorporated King County, and who should pay for it. The resolution of these issues is a high priority for the South Park neighborhood and their outcome will have a significant impact on this project.

2:05 site history

The South Park shoreline was created in order to provide a straight channel that would allow for predictable boat access; historically it was not a riverbank. The South Park area was part of a large estuarine marsh complex. West of the current shoreline, Dallas Avenue follows the curve of a former "oxbow" lake that was formed by the historic river channel. Prior to dredging, the main river channel was located to the east, in the vicinity of the current Boeing Field.

Residential development of South Park pre-dates dredging of the waterway. After dredging occurred in the early 20th century, the land uses at the site area continued to be farmland and residential, gradually becoming the latter. An aerial photograph from 1940 (at left) illustrates these land uses at that time. It appears that industrial uses in the project area are limited to two properties currently occupied by Long Painting and Spencer Industries. The use of the street ends for illicit dumping is a noted concern to residents. Proposed shoreline modifications will need to consider all of these current and past land uses.

2:06 site conditions

The project area is an enclave of unincorporated King County, surrounded by the City of Seattle on three sides and the river on the east. The Port of Seattle owns a 500-foot wide swath of land encompassing the Duwamish Waterway and the banks on either side. King County owns the street right-of-ways in the project area. Since the area is not part of an incorporated city, it has never been connected to a sewer system. The use of septic systems by the houses in the project area is often raised as a concern but will probably not be addressed until the area is annexed into an incorporated city, such as Seattle.

The image at right shows the project area which extends from the South Park Bridge to the boundary of Duwamish Waterway Park. The park is not included in the project scope. The map image shows important considerations for habitat restoration that is focused on juvenile salmon. These considerations include slope steepness in the intertidal and shallow subtidal areas, riparian (overhanging shoreline) vegetation, large woody debris, and vacant public land. The substrate in these areas is also a key component of habitat. The areas of gentle slope, fine substrate, such as mudflats, and overhanging vegetation are the most beneficial to juvenile salmon. The existing mudflats on both sides of the waterway are the highest quality habitats that exist in the project area. However, most of the project's shoreline riparian and intertidal zone has steep slopes, coarse substrate (concrete rubble), and no overhanging vegetation. Areas of unpaved public land, while limited, offer opportunities for habitat enhancement.

Project Area

Duwamish Waterway Park 1

overhanging vegetation and varied bank substrate 2

street end 3

typical steep bank 4

storm sewer outfall 5

typical mudflat 6

typical failing bank 7

common goals workshop

In March 2001, a Common Goals Workshop was held to share the analysis and "salmon primer" with South Park residents and landowners and listen to their concerns and goals for the project. Together with the neighborhood a list of design principles was conceived for the project.

Public Access

1. Provide opportunities for visual access to the river and riverbank from publicly accessible areas such as street ends.
2. Discourage physical access to the river or parallel to the river where it may conflict with habitat restoration and homeowner's privacy.

Safety/Security/Trespassing

1. Design plantings to allow for visibility from residences and street ends to the river.
2. Avoid creating areas of dense vegetation where people can hide.
3. Provide clear separation of public, semi-public, and private areas.

Water Quality

1. Maximize infiltration, interception, and evapotranspiration of rainfall to minimize stormwater runoff.
2. Treat stormwater runoff from paved areas using simple, low-maintenance methods.

Salmon Habitat Enhancement

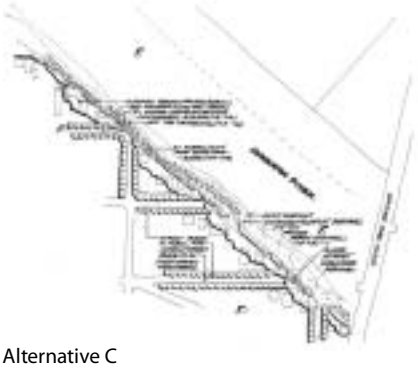
1. Protect and enhance functioning habitat areas such as mudflats.
2. Work with key variables within the project scope that can offer incremental habitat enhancement such as:
   - Slope
   - Substrate
   - Elevation
   - Vegetation
   - Large Woody Debris
3. Focus on needs of juvenile salmon for refuge, foraging, other (resting/loafing).
4. Avoid creating ponded water that strands fish and attracts avian predators.
5. Create stable bank conditions while minimizing use of large rock (low quality habitat), maximizing use of biotechnical methods (improved habitat quality).
6. Maximize a range of solutions that are adapted to the varying site conditions.
7. Develop solutions that are feasible to implement through the permitting/ESA process.

alternatives workshop

In April 2001, a series of alternatives was developed to illustrate the range of values that were communicated in the design principles. An Alternatives Workshop was held to share these alternatives with the neighborhood and receive feedback about how intensive and extensive an approach to take with the habitat restoration. Consensus emerged around a moderate course that retains all adjacent land uses but accommodates significant habitat improvements on public and private lands.

Alternative A

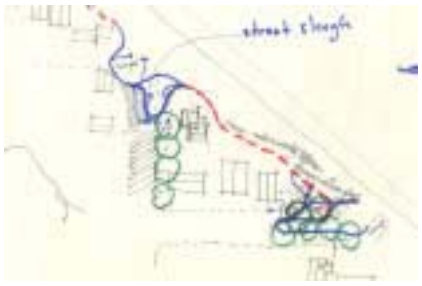
Alternative B



Alternative C

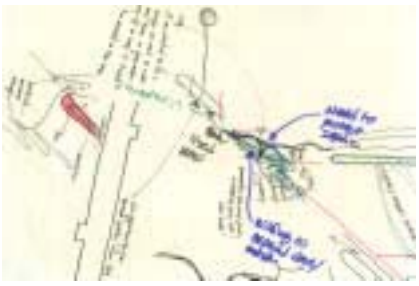
neighbors charrette

In May 2001, a draft vision was developed that illustrated the approach endorsed at the Alternatives Workshop. A Neighbors Charrette was held to present and refine this draft vision with the neighborhood. Three groups of "citizen planners" participated in a dynamic design session that generated some of the most innovative and ambitious aspects of the project.



Group 1 Plan

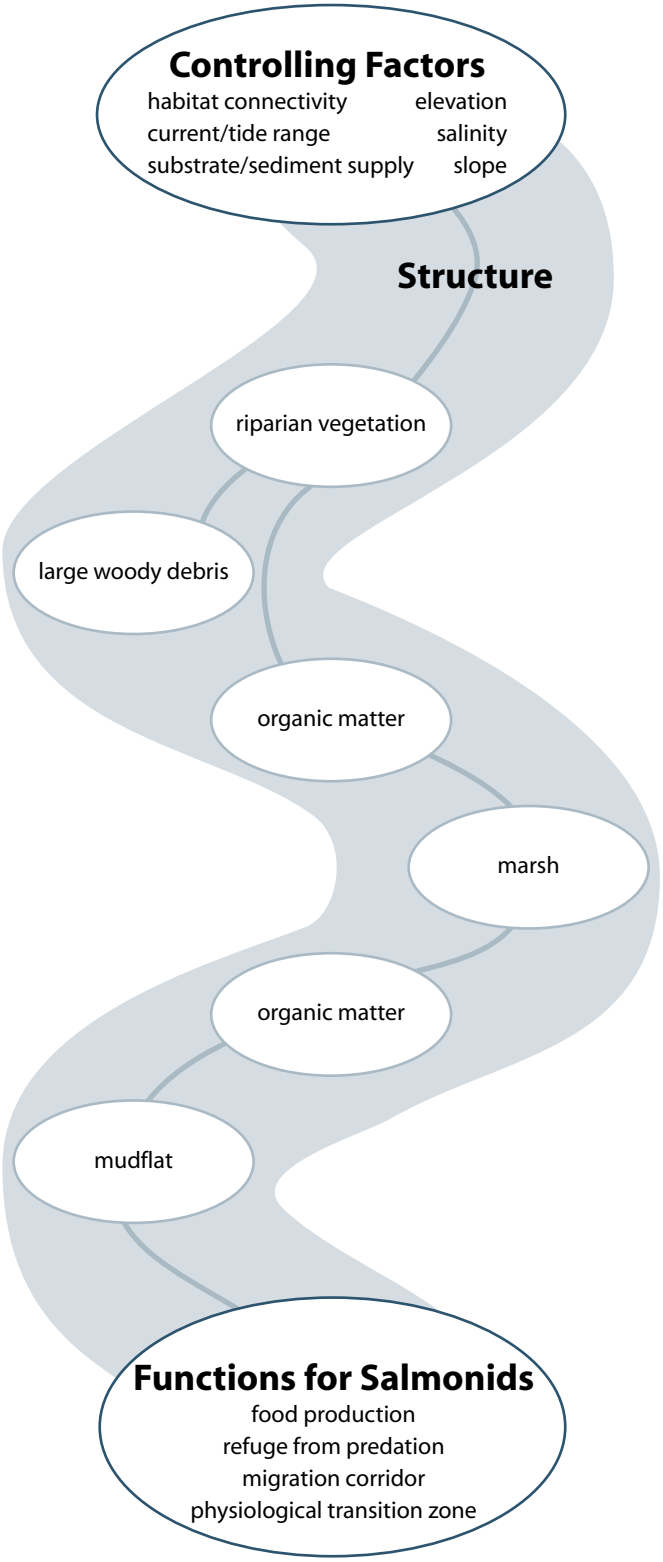
Group 2 Plan



Group 3 Plan

conceptual model: controlling factors, structure, and functions

The following approach to developing a conceptual model for habitat restoration is based on the Williams & Thom (Williams & Thom 2001) conceptual framework. This framework includes "Controlling Factors,""Habitat Structure," and "Habitat Function" relative to estuarine and nearshore environments. The term "Habitat Processes" is also used by Williams & Thom and is not used in this discussion for simplicity.



Controlling Factors

The ability to sustain the habitat structure and the functions they provide is determined by a combination of physical processes and environmental conditions called "controlling factors" (Williams & Thom 2001). These factors are influenced by both cultural (human caused) and natural forces at work on the site. The controlling factors affecting restoration on this site include the following:

- Current Velocity
- Salinity
- Habitat Connectivity to other habitats
- Substrate/Sediment Supply
- Tide Range/ Elevation
- Slope

Current velocity affects habitat structure because it is one of the primary physical forces shaping the site. The erosion of the upper banks and the rubble slopes below are shaped by current velocities particularly during high flow/high tide conditions related to storm events. The substrate materials and slopes proposed for the restoration need to be designed to withstand these critical events. Other boat wake and wind wave affects on this site are minimal due to the speed limit, small volume of boat traffic, and limited fetch (Tom Wang, Anchor Environmental, personal communication).

Salinity directly affects the flora and fauna inhabiting the site. It is a physical factor that has biological implications. This location is an estuary, a mixing zone of salt and fresh water. Juvenile salmon need time and refuge to physiologically adjust to higher salinity levels as they transition to more saline conditions (Simenstad et al, 1983; Aitkin, 1998). Vegetation proposed for the restoration needs to be appropriate for these conditions.

Habitat Connectivity is critical to the success of this restoration since it is focused on making a stronger upland/aquatic connection for a migrating aquatic species. The accessibility of water to the site and the ability of upland and marsh vegetation to provide inputs of organic matter (detritus) to the water is a key aspect of connectivity.

Substrate/Sediment Supply affects the size and source of the material sustaining the habitat structure, whether it is a mudflat or a marsh. Initially the restoration will rely on imported substrates for all restored areas. The mudflats however will remain unchanged except to have anthropogenic materials (human debris) removed. Subsequently, the entire site will be influenced by the supply of sediment. In order to be successful, the restoration needs to sustain itself with these naturally supplied sediments.

Tide Range/Elevation determines the water column depth and light availability to the site. These factors control the types of habitat structure, ranging from upland to mudflat, that can tolerate these different conditions. Tide range and elevation also affect current velocity and the amount of time various habitat areas are available to migrating juvenile salmon. The habitat restoration needs to provide habitat structure appropriate to the various elevation zones within the tide range.

Slope is related to several of the other factors including current velocity, substrate, and tide range. Different substrates and vegetation are stable at different slopes given the site conditions. These conditions change based on tide range and current velocity. Slope also is a critical factor for juvenile seeking refuge from predation with more gentle slopes providing increased refuge. The restoration will need to provide slopes that are stable for the proposed substrates and vegetation communities.

The restoration is intended to address these controlling factors so that the habitat structure is as self-sustaining as possible under the urban conditions it exists within.

Habitat Structure

The habitat structure consists of bands, sometimes quite narrow, defined by the controlling factors described above. Beginning at the top of the bank and working downward these bands include: riparian woody vegetation, estuarine marsh bench, an intermediate slope of rip rap/large woody debris or sand/gravel, and mudflat. The following table describes these habitat structures and the functions they provide:

Riparian Woody Vegetation

Source of insects, leaves, and wood to the aquatic habitat

Food Production, Source of LWD for Predator Refuge

Estuarine Marsh

Holds and creates nutrients in the form of plant material and softer sediments for invertebrates

Food Production

Intermediate slope: rip-rip/large woody debris

LWD provides a substrate for invertebrates and predator refuge, improves migration corridor

Food Production, Predator Refuge, Migration Corridor

Intermediate slope: sand/gravel

Finer substrate provides invertebrate production, gentler slopes provide predator refuge and improve migration corridor

Food Production, Predator Refuge, Migration Corridor

Mudflat

Finest substrate provides highest invertebrate production, gentlest slopes provide predator refuge, and maintains migration corridor

Food Production, Predator Refuge, Migration Corridor

The general steepness of the intertidal shorelines in the Lower Duwamish restricts the availability of shallow water habitats at certain tidal ranges. These habitats are important for juvenile salmon for feeding and evading predators while migrating downstream and adjusting to more saline conditions. The South Park project is intended to increase the amount of this intertidal habitat, although the ability to do so is limited by the space available.

Habitat Function

Estuarine habitat serves a number of related functions for juvenile salmon, notably migration, feeding, refuge, and residence for physiological transition from salt to fresh water (Anchor Environmental, 2001; Williams & Thom, 2001).
As stated previously, adult salmon migrating upstream utilize deeper water, are not feeding, and are migrating through the estuary quickly; therefore, the focus of this project is on juvenile salmon. Typically, juvenile Chinook in an estuary would be found in side channels feeding, resting, and undergoing physiological changes to salt water. Juvenile salmon are particularly reliant on feeding and resting habitat that provide a safe haven from predators as they move out to Puget Sound.

Food Production: Juvenile salmon eat invertebrates, insects, and smaller fish. Mudflats provide substrate for salmon prey production including forage fish and invertebrates (Williams & Thom, 2001). Enhancing habitat for these prey resources will increase their populations, and thereby help salmon. Trees with branches that overhang the water, like some of the existing willows, provide shade to keep water temperatures lower and drop leaves and branches into the water, providing additional substrate for invertebrates (Willliams & Thom, 2001). Large woody debris (LWD) provides substrate for aquatic insects and other prey organisms for juvenile salmon. LWD also adds complexity and structure to in-water habitat. Planting native evergreen trees along the shoreline is a way to create naturally-occuring LWD over the long term. Emergent marshes are very productive habitats, cycling nutrients between plants, detrivores, and larger animals such as salmon (Simenstad, 2000). Excavating the shoreline to create pockets of shallow water with plants that are able to root in standing water would diversify the range of plants and the habitat available to fish.

Predator Refuge: Preferred habitat for juvenile salmon seeking refuge from predation is shallow water, low gradient, often turbid habitats found in estuaries (Simenstad, 2000). The gentle slope of mudflats, such as those currently found on-site, provides the type of shallow water that juvenile salmon prefer in order to escape predation (Spence et al, 1996). Since the project site is tidally influenced, that water depth is extended over a greater elevation range and covers all of the intertidal and shallow subtidal zone. Juvenile salmonids have less food available and are more exposed to predators where the steep banks created by the channelization of the Duwamish have been further hardened by large substrate (such as rip-rap) and with the development of piers and bulkheads. Creating a more gently sloping shoreline and adding more large woody debris is proposed to increase the available refuge opportunities. Fish use is higher in areas of the Duwamish, such as Kellogg Island, where remnant intertidal shallows, emergent marsh, and overhanging riparian vegetation are available, as compared to the main channel.

Physiological Refuge: Juvenile salmon need shallow water habitat where they can spend enough time to make the adjustment from saltwater to freshwater (Simenstad et al, 1983; Simenstad, 2000; Aitkin, 1998). The time needed varies with individual species and runs of salmonids. This residence time requires enough food resources and sufficient habitat to evade predation.

Migration Corridor: This function is very dependent upon the other three functions being present and the continuity of habitat up and downstream. Juvenile salmon require a high degree of landscape connectivity as they migrate (Simenstad 2000). The presence of the mudflat on both sides of the Duwamish Waterway for long stretches currently provides the best migration corridor. However, intertidal habitat that addresses the other three functions, as well as migration, is lacking. The proposed restoration will improve the migration corridor within the site by extending it up from the mudflat into the intertidal zone.

Evaluation Criteria

The following list of criteria provide a wide range of factors upon which a project such as this one can be evaluated. The source is Shreffler and Thom from their "Unranked List of Criteria for Scientifically Evaluating Approaches for Restoration of Degraded Urban Estuaries of Puget Sound:"

- Degree of predictability of success
- Short-term expediency; immediate realization of ecological benefit
- Self-maintaining
- Habitat composition integrated within the landscape
- Education of habitat fragmentation
- Maximization of benefits to target resources (species or species groups):
  - direct (e.g. food, refuge, reproduction)
  - indirect (e.g. productivity, habitat linkages)
- Optimization of habitat improvement decisions in view of physical/ chemical modifications of estuary (including proposed future changes)
- Degree of dependency on water quality improvements, degree of control over water source
- No destruction/ alteration/ degradation of existing viable habitat
- Provision for benefits outside the estuary (e.g. detrital transport)

The project as conceived does well based on most of these criteria due in part to the ability to learn from similar restoration projects on the Duwamish that have been extensively monitored. Some of criteria that will prove difficult are the "self maintaining" and "habitat composition integrated within the landscape." These two criteria would be the most difficult to achieve given the urban nature of the site and the surrounding land uses which will remain urban. One example is large woody debris, which is not self-maintaining given the urban location. However, these limitations are known in advance and can be planned for.

riverfront laboratory: concepts applied to riverfront zones

Reflecting specific conditions along the riverfront and the varying degrees of participation by adjacent landowners, a series of eight distinct "zones" was defined in the project area. A collection of design and engineering approaches was assembled to improve the juvenile salmon habitat potential of these zones. These approaches are illustrated in the plan, sections, perspective sketch, and topographic models on the following pages.

Some design considerations that apply throughout the project area were identified in the conceptual model (section 4.01). Some design considerations are specific to particular zones and these are highlighted in the description of each zone on the next page.

The added sinuosity improves the quality of the habitat for juvenile salmon. Taken together the zones represent a "living laboratory" where the effectiveness of the different techniques will be able to be evaluated and compared. The project would create or enhance 93,400 square feet of area. This is approximately 2.1 acres. 25,500 square feet are in the mid to lower intertidal range. 38,800 square feet, nearly an acre, are in the upper intertidal range. 29,100 square feet are above the high tide line. The project would increase the length of the shoreline by over 50%, from 1450 linear feet to 2225 linear feet.

There are also many practices that inland property owners can adopt to improve juvenile salmon habitat. A riparian buffer of at least 200 feet would greatly improve Duwamish River water quality and create more potential food for juvenile salmon so we propose significant planting of trees and shrubs on public and private property. Use of rain barrels, retention of stormwater, and removal of failing septic systems are just a few examples of practices that could contribute to this project.

Zone 1 currently has steep slopes, rock and debris substrate, and a lack of overhanging vegetation. The owner of the adjacent industrial property has supported the idea of Port of Seattle property being improved for habitat. We are proposing that overhanging vegetation with brush layering be planted above the high tide line and that a 2:1 cellular confinement system be employed to hold emergent marsh vegetation in the upper intertidal range and fine substrate in the lower intertidal range. This system would be anchored at the toe of the slope by large rocks and rootwads. The existing mudflat would remain undisturbed.

Zone 2 currently has steep slopes, rock and debris substrate, and little overhanging vegetation. The adjacent residential properties may be for sale in the near future. We are proposing that overhanging vegetation with brush layering be planted above the high tide line. We are proposing a narrow marsh bench for the upper intertidal range and a 2:1 rootwad and riprap slope for the lower intertidal range. The existing mudflat would remain undisturbed. We are proposing that a pair of side channels be excavated between and around the adjacent residences in zones 2 and 3. These residences would be reached by small bridges over the side channel. Elmgrove Street and 12th Avenue would become dead ends.

Zone 3 currently has moderate to steep slopes, rock and debris substrate, and little overhanging vegetation. The owners of the adjacent residential properties have supported the idea of Port of Seattle property and their own property being improved for habitat. We are proposing that overhanging vegetation and brush layering be planted above the high tide. We are proposing a narrow marsh bench for the upper intertidal range and a 1:1 riprap slope and rootwad matrix for the lower intertidal range. The existing mudflat would be expanded over a shallow slope toward the bank. We are proposing that a pair of side channels be excavated between and around the adjacent residences in zones 2 and 3. These residences would be reached by small bridges over the side channels. Elmgrove Street and 12th Avenue would become dead ends.

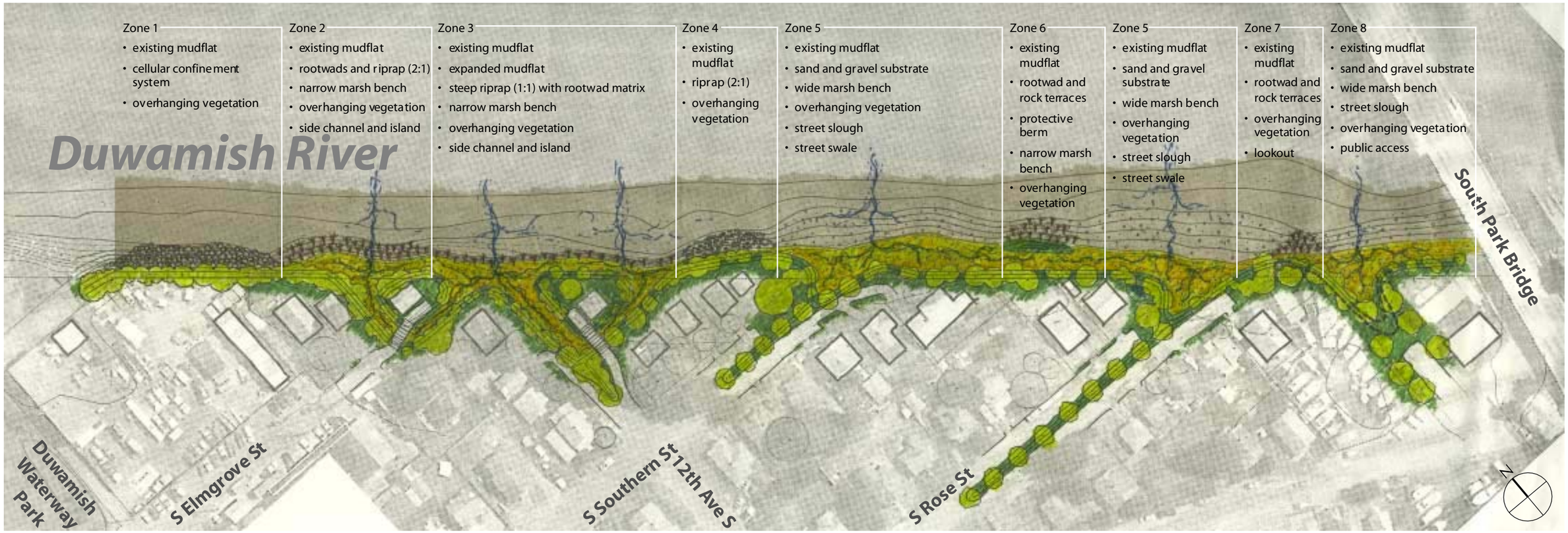
Zone 4 currently has steep slopes, rapidly eroding rock and debris substrate, and some overhanging vegetation. The adjacent residential landowner has been reluctant to allow manipulation of the Port of Seattle property and would prefer traditional riprap bank construction methods but has endorsed the idea of planting overhanging vegetation. We are proposing that overhanging vegetation be planted with a "pole planting" technique above the high tide line and that a 2:1 rip rap slope be employed in the intertidal range. The existing mudflat would remain undisturbed.

Zone 5 currently has shallow to moderate slopes, debris and mud substrate, and some overhanging vegetation. The adjacent residential landowners have supported the idea of Port of Seattle property and some of their own property being improved for habitat. We are proposing the planting of overhanging vegetation above the high tide line. We are proposing that the street ends on Rose and Southern Streets be improved as "street sloughs," wide coves of emergent marsh vegetation contiguous with a wide marsh bench in the upper intertidal range. We are proposing that the Rose and Southern residential streets be improved with "street swales," shallow unpaved depressions in the middle of the street (illustrated on page 29), to receive surface water run-off. The planted street swales (shallow depressions) would cleanse and detain stormwater and finally direct it toward the street sloughs. We are proposing a 7:1 sand and gravel slope for the lower intertidal range. The existing mudflat would remain undisturbed.

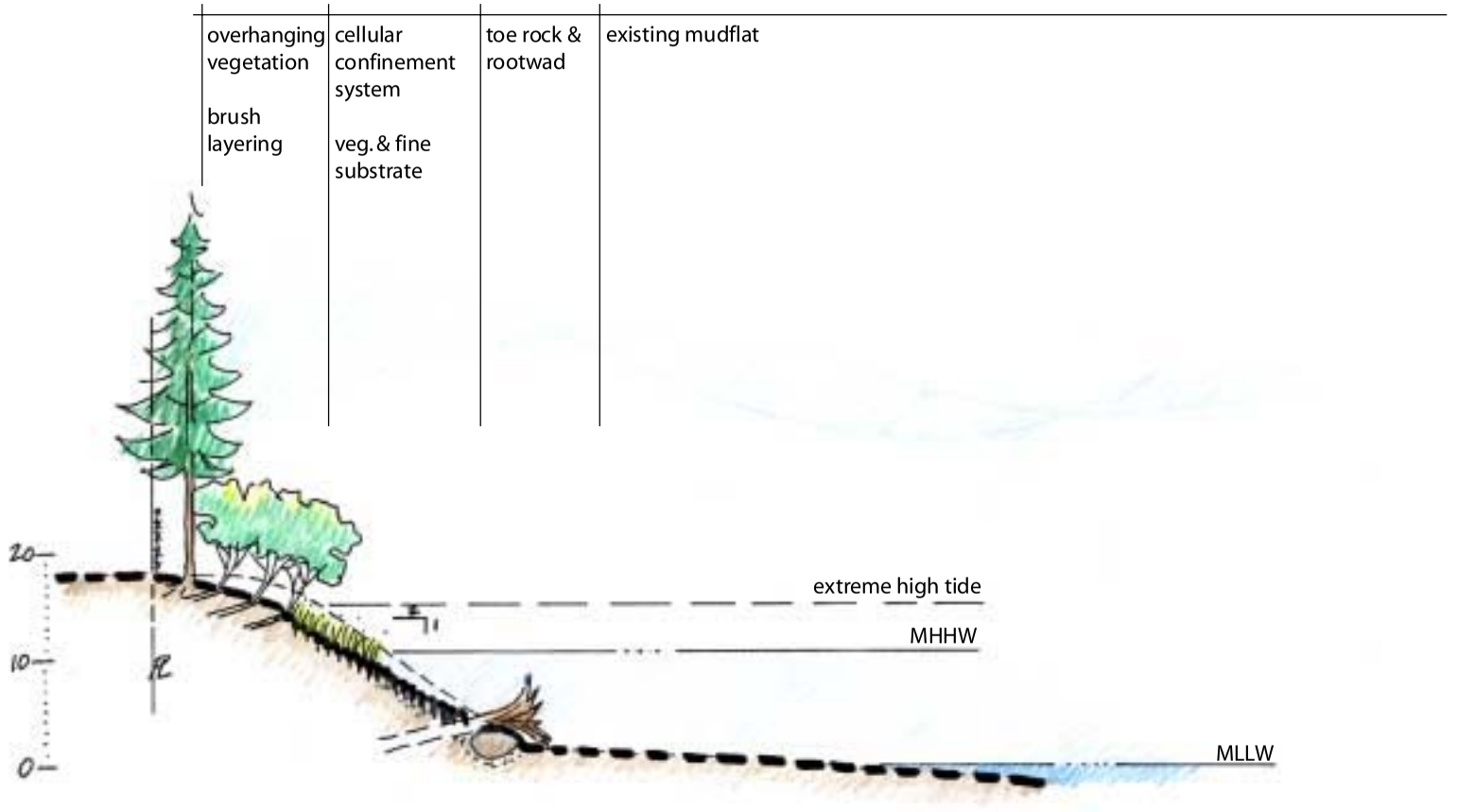
Zone 6 currently has a moderate slope, rock and debris substrate, and little overhanging vegetation. This zone is essentially a steeper slope that separates the two pieces of zone 5. The adjacent residential landowner has supported manipulation of the Port of Seattle property. We are proposing that overhanging vegetation be planted above the high tide line and that a narrower marsh bench be bounded by a berm in the upper intertidal range. The proposed berm is an experimental technique intended to protect the marsh bench from wave action and create a flushing action out of the marsh. We are proposing that rootwad and rock terraces with 5:1 mud surfaces be employed in the lower intertidal range. The existing mudflat would remain undisturbed.

Zone 7 currently has shallow to moderate slopes, debris and mud substrate, and a lack of overhanging vegetation. The top of bank juts out slightly in this zone and the adjacent property is a storage area for a marina. We are proposing the construction of a lookout for viewing the Duwamish River and the restoration project from the top of the bank in zone 7. The lookout would be reached by a path from a public access in zone 8. We are proposing that overhanging vegetation be planted above the high tide line and that rootwad and rock terraces with 5:1 mud surfaces be employed in the intertidal range. The existing mudflat would remain undisturbed.

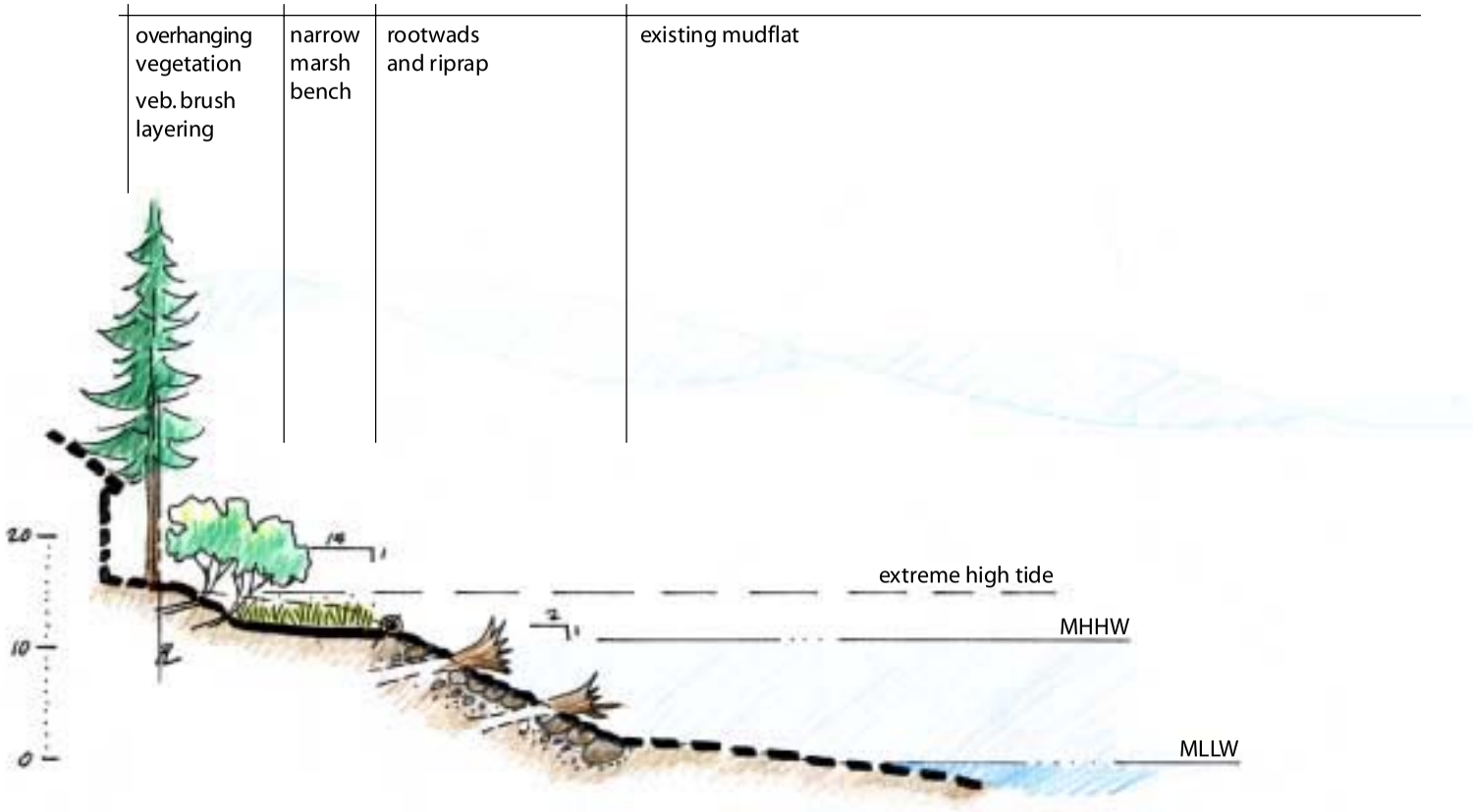
Zone 8 currently has moderate slopes, debris and mud substrate, and a lack of overhanging vegetation. The adjacent King County street end lies between two storage areas of a marina beside the South Park Bridge. This zone is a short walk from the main commercial strip of South Park, is visible from the South Park Bridge, and is not adjacent to any residential properties. We are proposing that this zone be a park-like setting with the streetend becoming a public access. We are proposing that overhanging vegetation be planted above the high tide line on a series of seatwall terraces constructed from debris removed from the riverfront. A path would lead to the overlook in zone 7. Visitors would be restricted to this park and the lookout. We are proposing a street slough and wide marsh bench for the upper intertidal range and a 4:1 sand and gravel slope for the lower intertidal range. The existing mudflat would remain undisturbed.


Zone 1
• existing mudflat
• cellular confinement system
• overhanging vegetation
Zone 2
• existing mudflat
• rootwads and riprap (2:1)
• narrow marsh bench
• overhanging vegetation
• side channel and island
Zone 3
• existing mudflat
• expanded mudflat
• steep riprap (1:1) with rootwad matrix
• narrow marsh bench
• overhanging vegetation
• side channel and island
Zone 4
• existing mudflat
• riprap (2:1)
• overhanging vegetation
Zone 5
• existing mudflat
• sand and gravel substrate
• wide marsh bench
• overhanging vegetation
• street slough
• street swale
Zone 6
• existing mudflat
• rootwad and rock terraces
• protective berm
• narrow marsh bench
• overhanging vegetation
Zone 5
• existing mudflat
• sand and gravel substrate
• wide marsh bench
• overhanging vegetation
• street slough
• street swale
Zone 7
• existing mudflat
• rootwad and rock terraces
• overhanging vegetation
• lookout
Zone 8
• existing mudflat
• sand and gravel substrate
• wide marsh bench
• street slough
• overhanging vegetation
• public access
Duwamish River
South Park Bridge
Duwamish Waterway Park
S Elmgrove St
S Southern St
12th Ave S
S Rose St
N

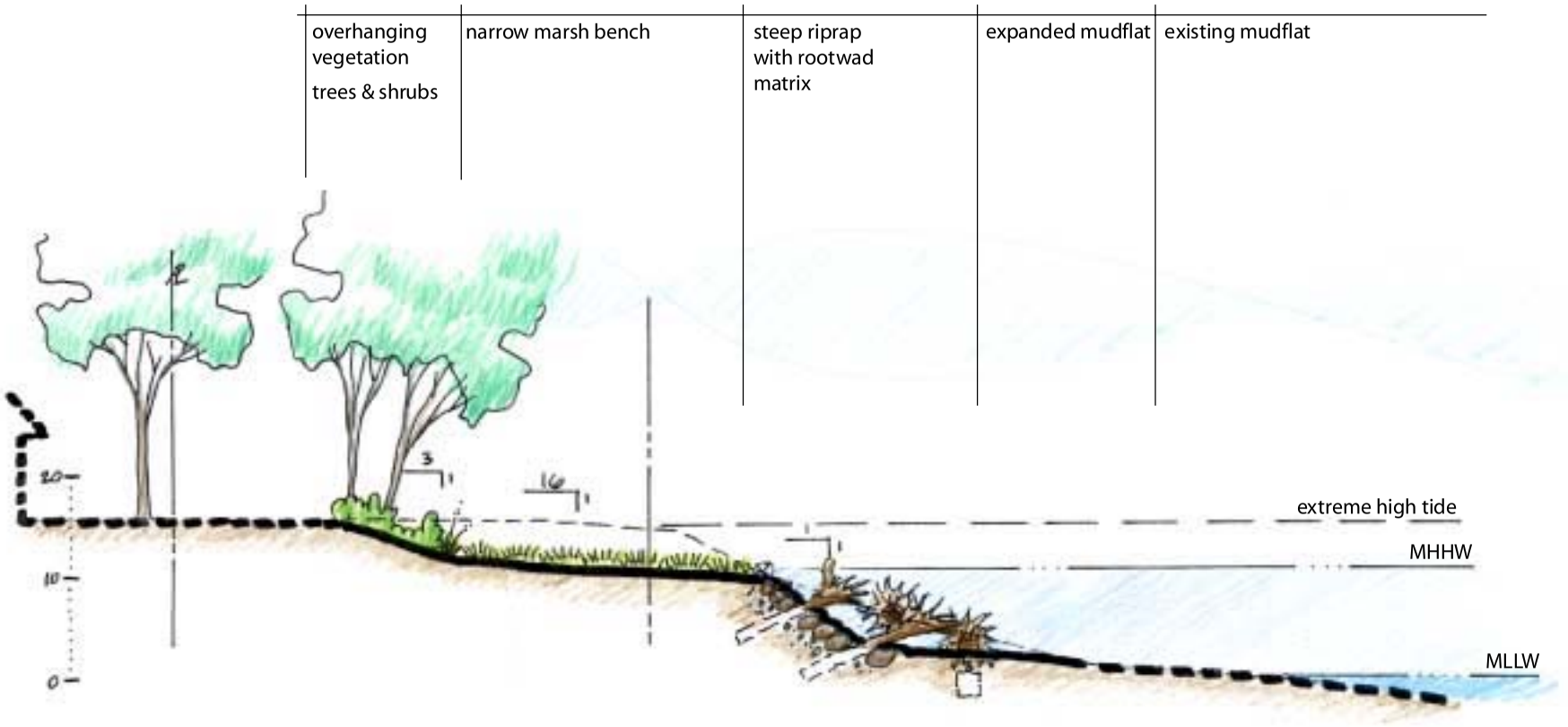
zone 1 section



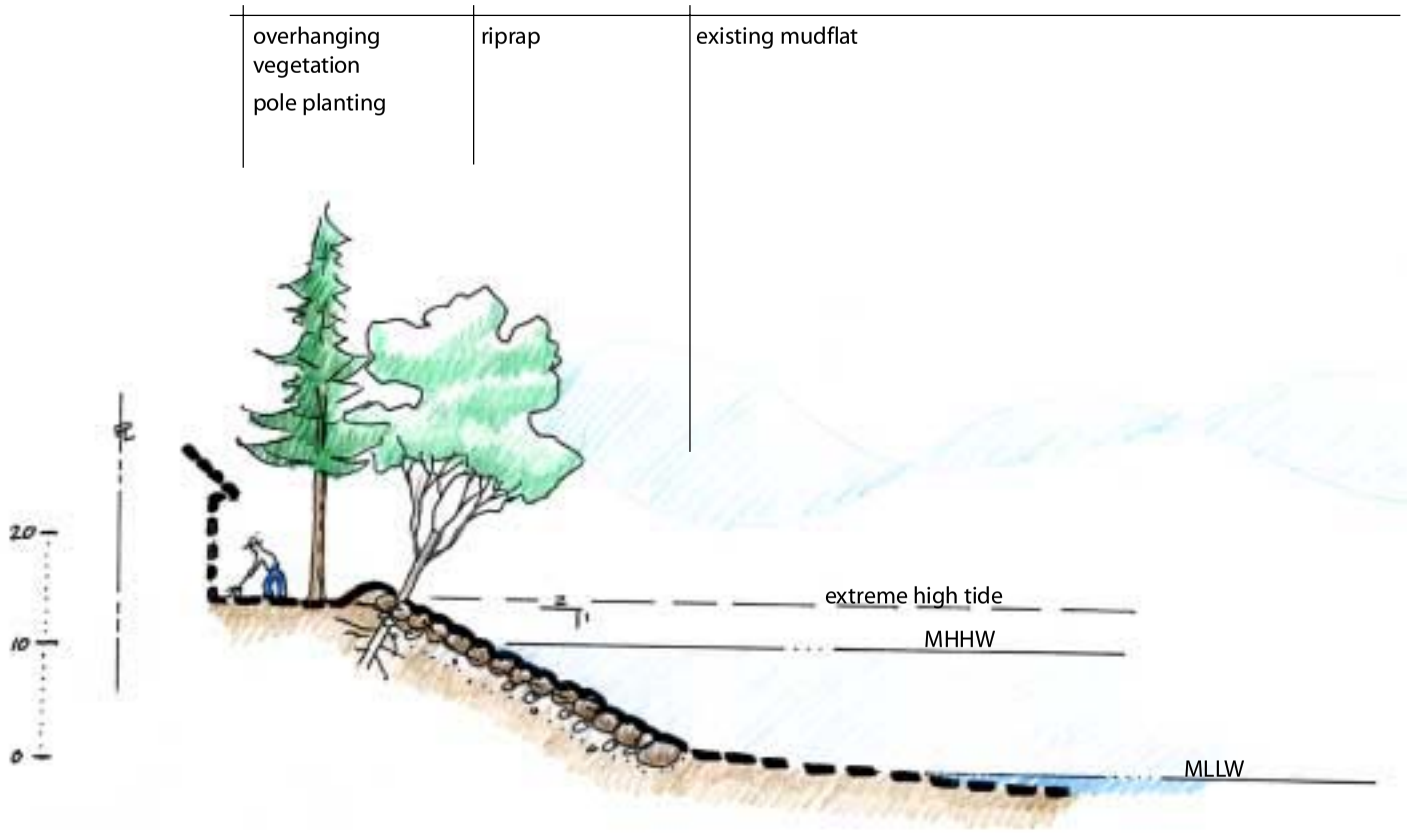
zone 2 section



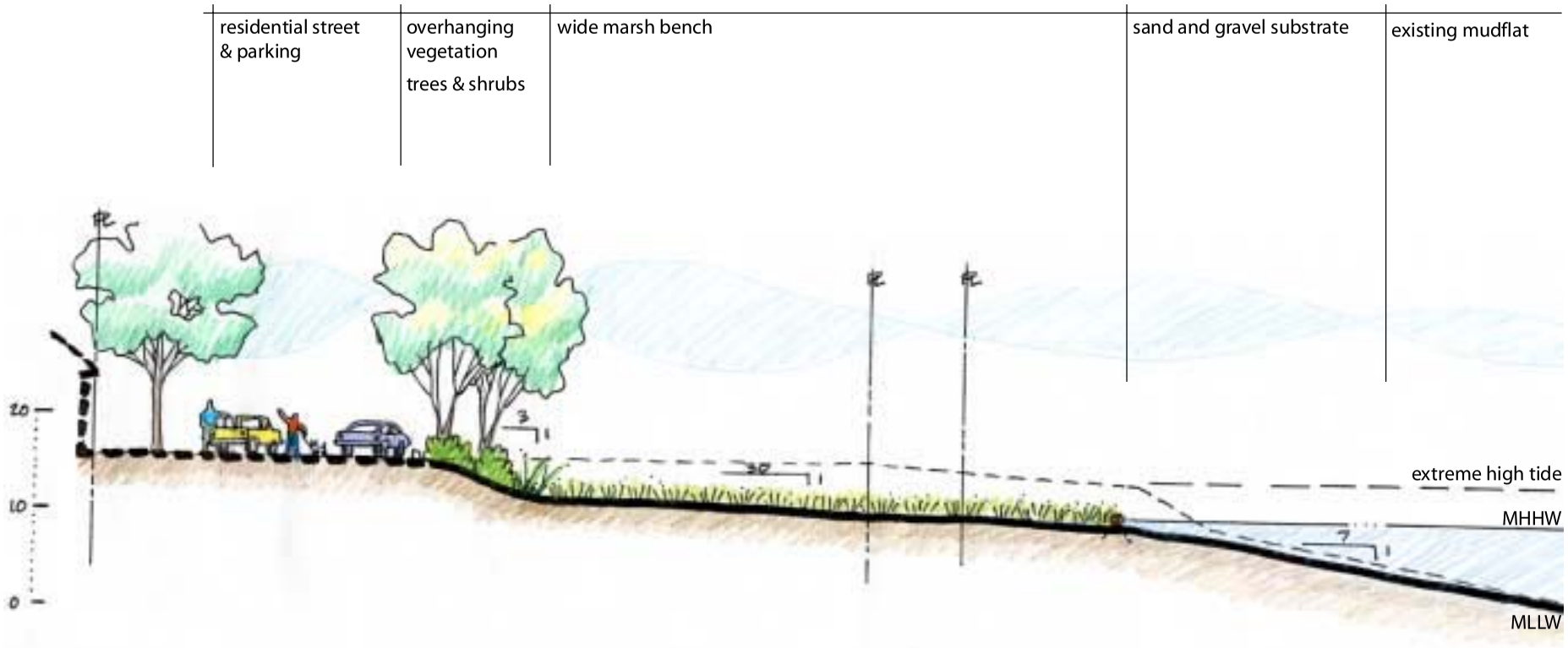
4:06 zone 3 section



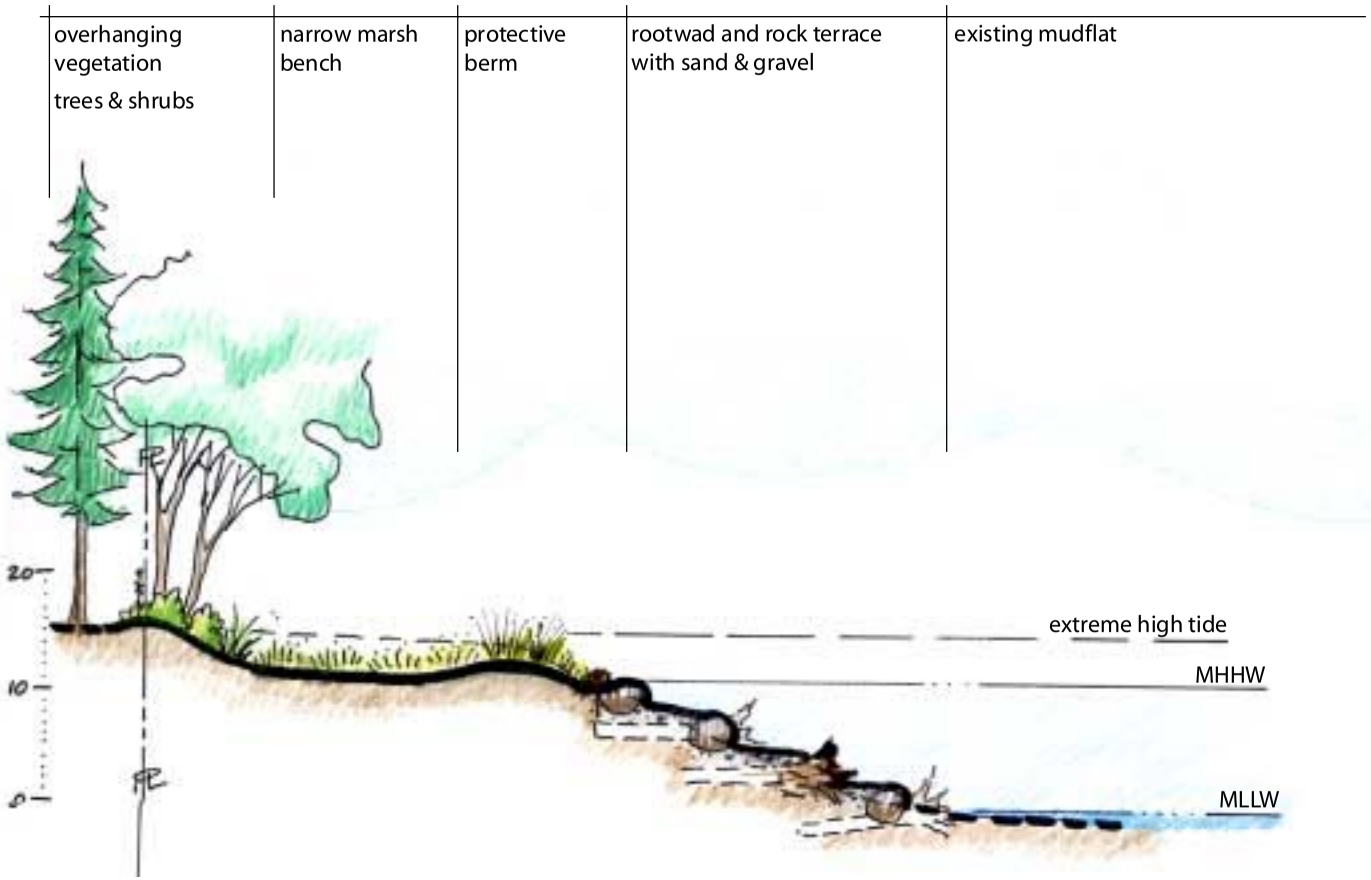
zone 4 section

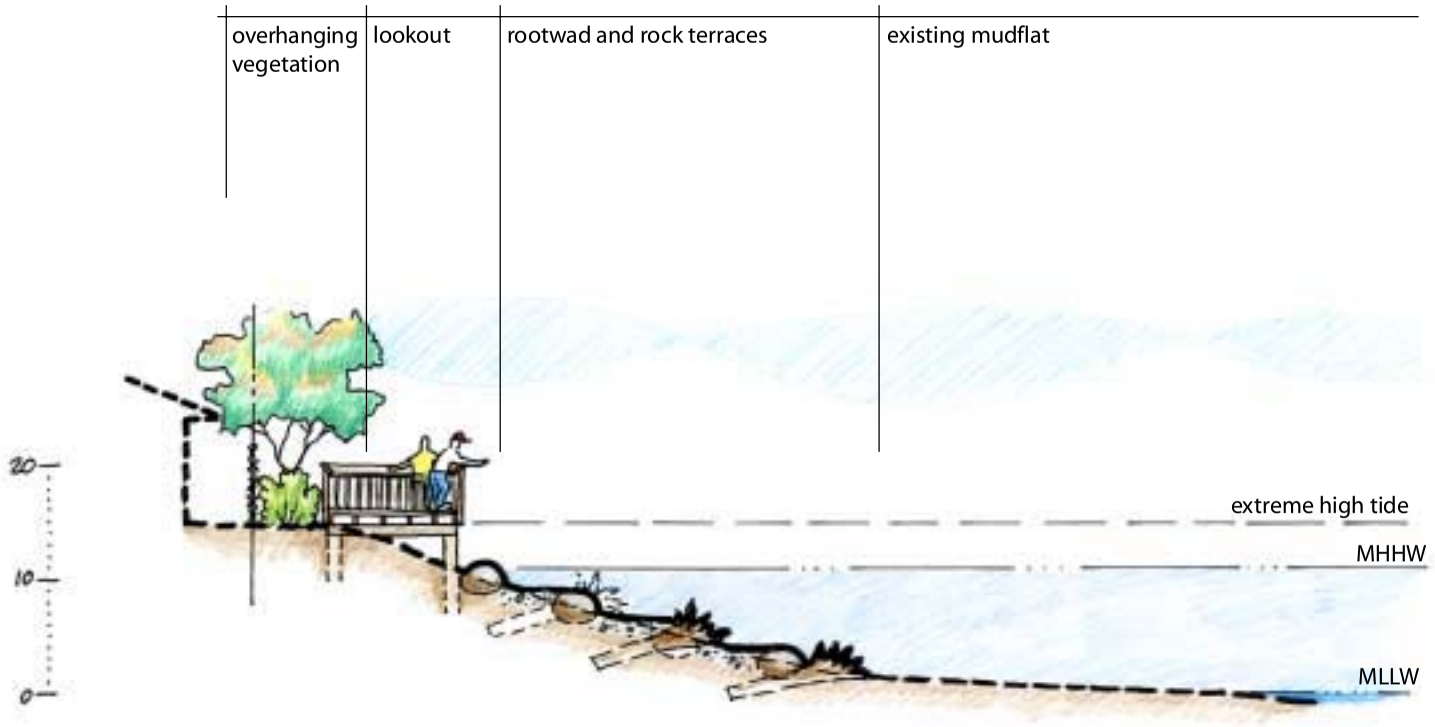


zone 5 section

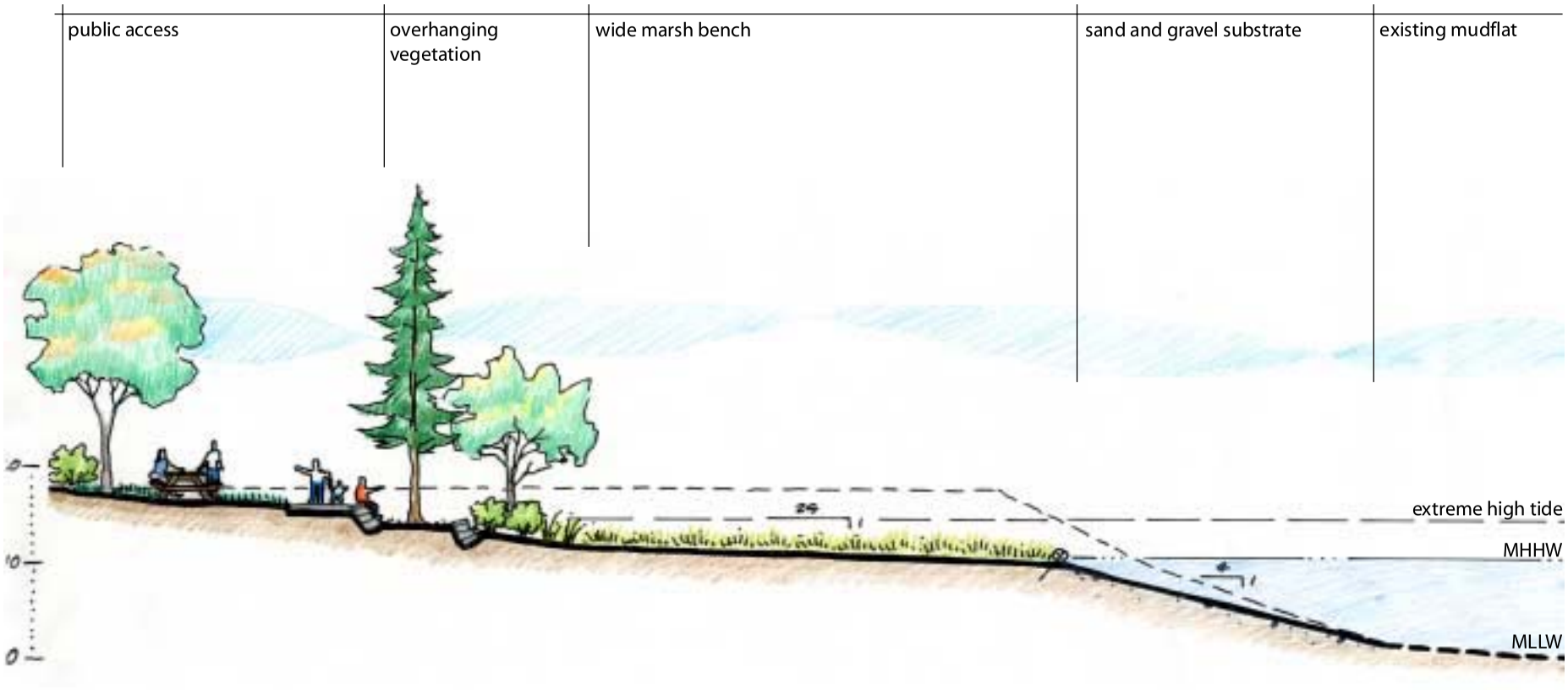


zone 6 section

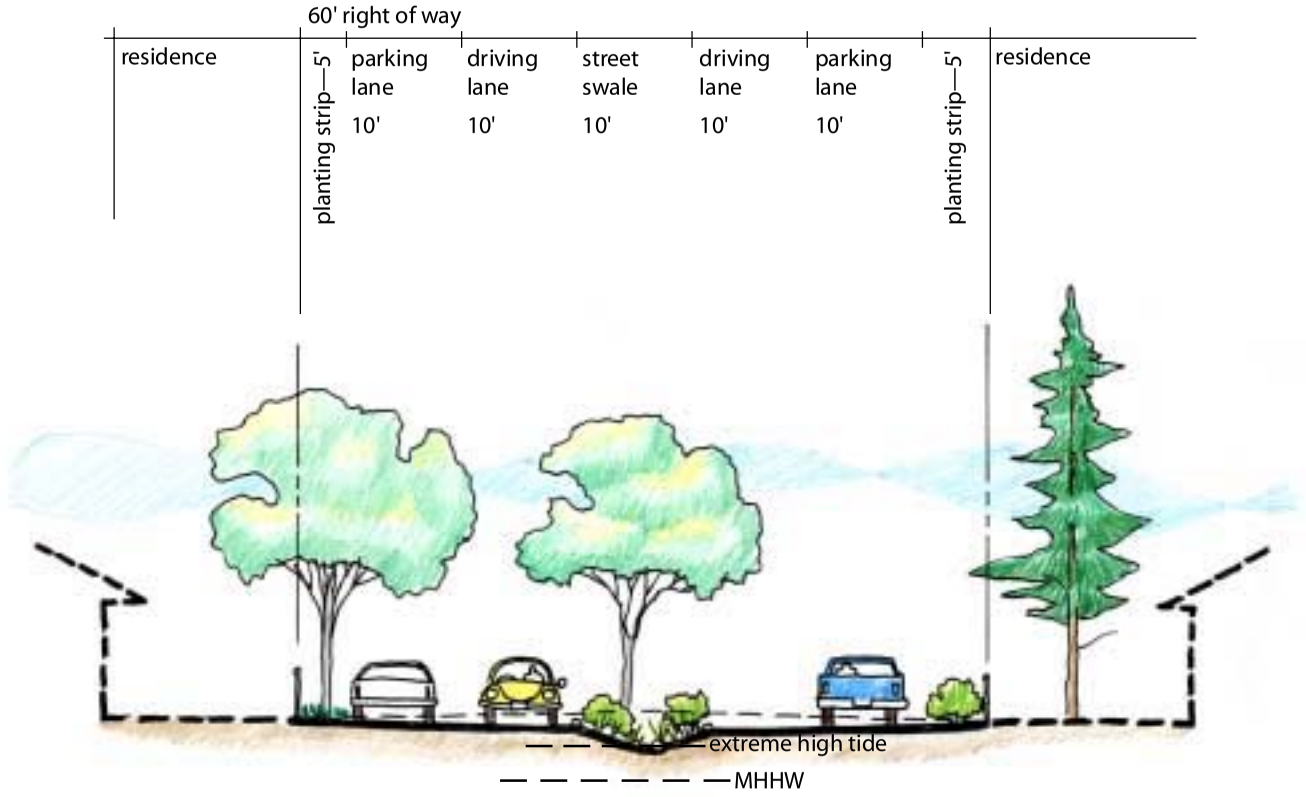



overhanging vegetation
lookout
rootwad and rock terraces
existing mudflat
20
10
0
extreme high tide
MHHW
MLLW

zone 8 section



street swale section

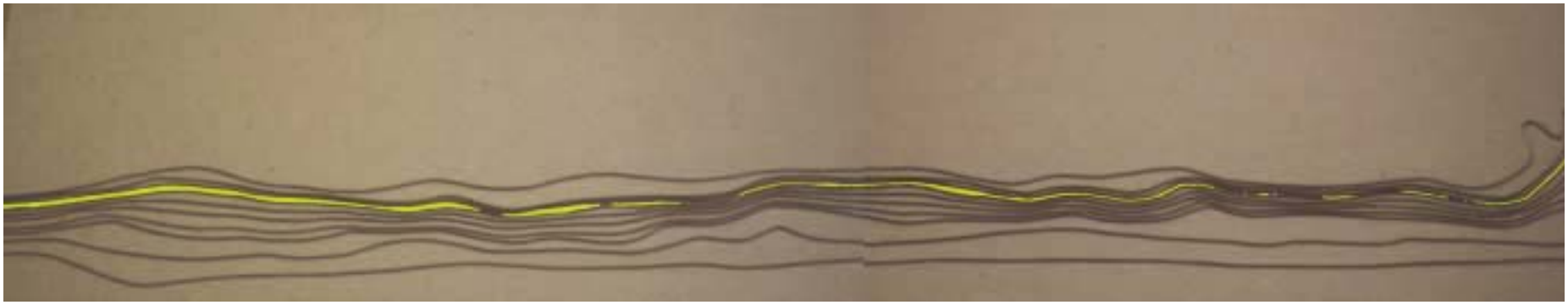


4:13

riverfront perspective

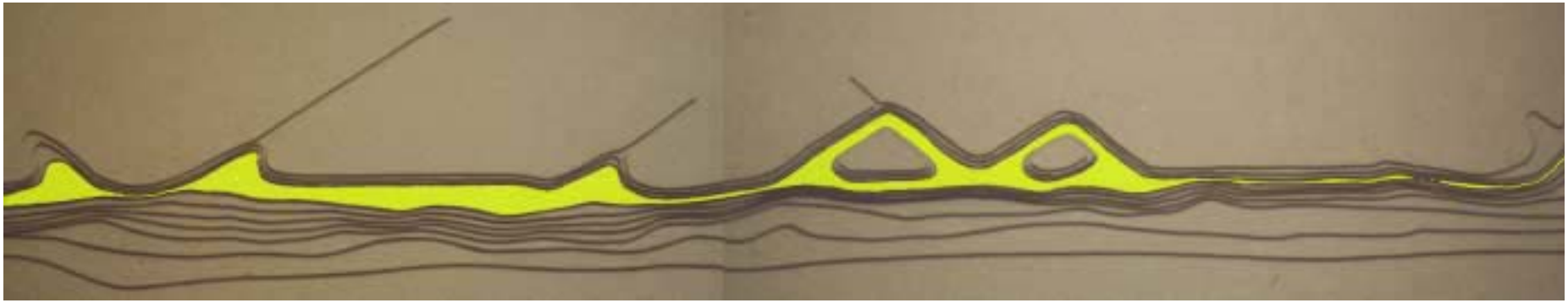
riverfront model photos

Existing



Existing and proposed topographic models of the project area illustrate the dramatic increase in upper intertidal habitat.

Proposed



budget and funding strategy

Implementation of this habitat restoration project will include focused data gathering to design and permitting activities. Estimated costs for implementation and potential funding sources are discussed below.

Estimated Costs

Estimated costs are based on the plan on page 19. The estimated costs include direct construction costs and other costs associated with construction such as permit coordination and fees, taxes, survey, geotechnical investigation and related laboratory testing (physical and chemical characterization of soils and groundwater), design and engineering, and construction inspection. The costs assume the work will be completed as one construction phase, and that no site acquisition or cleanup of contaminated soils or groundwater is required. Agency administrative costs (Port and King County) are unknown and therefore are not included. The costs are broken out by property ownership which consists of the Port of Seattle, King County, and private property owners. The costs included for private property owners are based on those private owners who have expressed a willingness to consider regrading and other construction activity for the purpose of restoring habitat on their property. These private property costs do not include "Best Management Practices" (BMPs) such as planting trees and retaining rainfall onsite. The following is a summary of the estimated costs:

Port of Seattle Duwamish Waterway Property

Items Included:

Demolition, Clearing, & Temporary Facilities	
Earthwork	
Shoreline Protection	
Viewpoint	
Restoration Planting & Protectiion	
Other Construction Related Costs	
Total Port of Seattle	$2.5–3 million

King County Street Right-of-Way Property

Items Included:

Demolition, Clearing, & Temporary Facilities	
Earthwork	
Utility Relocations	
Street Repaving	
Restoration, Swale & Street Tree Planting & Protection	
Other Construction Related Costs	
Total King County	$1.5–2 million

Interested Private Properties

Items Included:

Demolition, Clearing, & Temporary Facilities	
Earthwork	
Replacement Fencing	
Driveway Asphalt Paving	
Restoration Planting & Protection	
Other Construction Related Costs	
Total Private Property	$.2–.3 million

Total Project	**$4.2–5.3 million**

Potential Funding Sources

Potential funding for implementation may include one or more of the following:

- Local, state, and federal agencies that fund habitat restoration projects supporting salmon recovery.
- Non-profit organizations involved in habitat restoration.
- Public and private entities seeking habitat restoration projects to either mitigate for a proposed project with aquatic impacts, or to settle a natural resource damage claim arising from past injuries (e.g., the proposed Lower Duwamish Superfund designation).

Funding opportunities for habitat restoration covering the first two bullets above are outlined in the table of Funding Opportunities on pages 33 to 36. Given the site's geography of being an enclave of unincorporated King County surrounded by the City of Seattle, and the potential for annexation, both the City and County are listed as potential funding sources.

Name and Contact Information	Description
LOCAL	
City of Seattle Department of Neighborhoods Matching Fund 700 3rd Ave Room 400 Seattle WA 98104-1848 206 684 0464 rebecca.sadinsky@ci.seattle.wa.us www.ci.seattle.wa.us/don/basic.htm	Provides project money and technical assistance to neighborhood groups in Seattle to implement neighborhood-based projects, including those that improve the environment, provide community education, or "green" the Neighborhood. The Small and Simple Projects component of the Neighborhood Matching Fund makes grants up to $10,000, with application deadlines every two months. The Semi-Annual component makes awards over $10,000, with application deadlines every six months. Volunteer time, donated professional services, cash, and donated equipment or supplies are valued for the required match. For application materials and information about program requirements, call the number at left.
Seattle Public Utilities **STEP (Stewardship Through Environmental Partnership Assistance)** 710 2nd Ave Ste 660 Seattle WA 98104-1709 Pat O'Brien: 206 684 8513 www.ci.seattle.wa.us/util/	Awards up to $5,000 are given for water quality education or restoration projects. Grant applications are accepted on an ongoing basis.
Small Change for a Big Difference (formerly known as **Watershed Action Grants Program**) Donna Kalka: 206 296 8494 donna.kalka@metrokc.gov dnr.metrokc.gov/wlr/pi/SmallChange.htm	Small Change for a Big Difference funds projects up to $1000 in support of salmon and watershed education, enhancement, protection and restoration efforts in King County. A rolling deadline lets you apply any time during the year through a letter of intent process. City and agency projects are not eligible for funding. Grassroots organizations are strongly encouraged to apply.
Urban Reforestation and Habitat Restoration Grants Kate Stenberg, Wildlife Program Planner: 206 296 7266 dnr.metrokc.gov/wlr/lands/urhrdesc.htm	Funds are available under the Urban Reforestation and Habitat Restoration Grants Program. Grants support projects to reforest urban areas, remove invasive non-native plant species, or provide wildlife habitats. Applications are due October 15 and April 22 for each year. Call for more information.
WaterWorks Grants Ken Pritchard: 206 296 8265 ken.pritchard@metrokc.gov dnr.metrokc.gov/wlr/waterres/wsf/wsfinfo.htm	Individual grants up to $50,000 are available for projects that protect or improve watersheds, rivers, lakes, wetlands, and tidewater. Projects must provide opportunities for stewardship. There are several funding cycles each year. Call for application deadline dates.
Puget Sound Urban Resources Partnership **King County Department of Natural Resources** 201 S Jackson St Suite 600 Seattle WA 98104-3855 Linda Vane: 206 296 8042 linda.vane@metrokc.gov dnr.metrokc.gov/partners/	Grants and technical assistance are available for projects in the Greater Seattle Area that protect, improve, and rehabilitate the urban natural environment. Projects must improve water quality, address erosion problems, or increase forest cover in environmentally degraded and/or economically disadvantaged communities. Requests are encouraged in the range of $25,000 but may be any value up to $75,000. Requested amount must be matched with non-federal cash or in-kind services/goods. Technical assistance, in areas such as permit acquisition, natural resource expertise, and volunteer management, may also be provided to aid project completion.

Name and Contact Information	Description
STATE	
Mid-Sound Fisheries Enhancement Group 7400 Sand Point Way NE Seattle WA 98115-6302 206 529 9467 midsound@nwlink.com	This group is one of the Department of Fish and Wildlife's 12 regional Fisheries Enhancement Groups. They fund projects in the mid-Sound region related to salmon enhancement and preservation—stream rehabilitation, habitat repair, remote site incubators, plant salvages, conservation easements, and other related activities. Mid-Sound has small amounts of money that can be applied for as project matches. They are also willing to partner with other groups or individuals or to sponsor new projects. There are no submission deadlines. Brief letters of inquiry are accepted year round.
Puget Sound Water Quality Action Team **Public Involvement and Education (PIE) Fund** PO Box 40900 Olympia WA 98504-0900 Karin Van Vlack: 360 407 7300 / 800 54-SOUND www.wa.gov/puget_sound/	Project funds are available for public involvement and education activities to protect and improve Puget Sound's water quality and marine resources. Visit their web site or call for more information, including future application deadlines.
Salmon Recovery Funding Board **Salmon Habitat Recovery Grant** PO Box 40917 Olympia WA 98504-0917 360 902 2636 salmon@iac.wa.gov www.wa.gov/iac/salmonmain.html	The Board will support salmon recovery by funding habitat protection and restoration projects and related programs and activities that produce sustainable and measurable benefit for the fish and their habitat. Application deadline Nov. 30th. (Deadlines for applications depend on funding cycles. Call for current deadlines.) Applications available at www.wa.gov/iac/salmongrants.html.
Washington Department of Fish and Wildlife **Volunteer and Cooperative Projects Program** 600 Capitol Way N Olympia WA 98501-1091 Dave Gadwa, Program Manager: 360 902 2806 www.wa.gov/wdfw/	The Washington Department of Fish and Wildlife (WDFW) is accepting grant applications from individuals and volunteer groups conducting local projects to benefit fish and wildlife. The agency plans to distribute $1.6 million in grants over a two-year period beginning July 1 2001. "This funding is specifically earmarked for volunteer programs," said Dave Gadwa, coordinator of WDFW's Volunteer Cooperative Fish and Wildlife Enhancement Program. Grants have ranged from $300 to $75,000 in past years to help volunteers pay for materials necessary for projects approved by the agency. Funding cannot be used for wages or benefits. Examples of past projects include habitat restoration, improving access to fish and wildlife areas for disabled people, fish and wildlife research, public education and fish-rearing projects that can benefit the public.

Name and Contact Information	Description
FEDERAL	
U.S. Army Corps of Engineers—Seattle District Pat Cagney PO Box 3755 Seattle WA 98124-2255 www.nws.usace.army.mil/pm/GDProject.html	The Army Corps of Engineers is scoping Ecosystem Restoration for the Green-Duwamish system.
NOAA Fisheries Restoration Center 1315 East-West Highway SSMC3 Silver Spring MD 20910-3282 Christopher D. Doley: 301 713 0174 Chris.Doley@noaa.gov www.nmfs.noaa.gov/habitat/restoration	The NOAA Fisheries Restoration center has financial assistance available for community-based projects to restore fish habitats under the NOAA Community-Based Restoration Program. The Program's objective is to bring together citizen groups, public and nonprofit organizations, industry, corporations and businesses, youth conservation corps, students, landowners, and local government, state, and Federal agencies to implement habitat restoration projects to benefit NOAA trust resources. Deadline dates change annually.
USBR, NMFS, and NFWF **Pacific Grassroots Salmon Initiative** 116 New Montgomery St Ste 203 San Francisco CA 94105-3640 415 778 0999 Hammerline@nfwf.org	Seeks to catalyze and support salmon friendly activities at the grassroots level in California, Oregon, and Washington. Activities eligible for challenge grant funds include salmonid habitat restoration projects as well as efforts to encourage and assist communities in key salmonid watersheds to engage in watershed planning, management and public outreach. Call for application deadlines.
U.S. Fish & Wildlife Service 510 Desmond Drive SE Suite 102 Lacey WA 98503-1292 Alisa Ralph: 360 753 9440 www.r1.fws.gov	USFWS has made 7 grants for wetlands restoration and acquisition to PNW, from the National Coastal Wetlands Conservation Grant program. A total of 25 grants were made nationwide. All grants are awarded through a competitive process. Funding for the program is generated from excise taxes on fishing equipment and motorboat and small engine fuels. These taxes are deposited into the Sport Fish Restoration Account of the Aquatic Resources Trust Fund (commonly called Wallop-Breaux after its Congressional sponsors). For more information about the National Coastal Wetlands Conservation Grants program write to the National Coastal Wetlands Conservation Grant Program, Division of Habitat Conservation, U.S. Fish and Wildlife Service, 4401 North Fairfax Drive, Room 400, Arlington, Virginia 22203; or visit the program's Internet site at http://www.fws.gov/cep/cwgcover.html.
NON–PROFIT	
National Fish and Wildlife Foundation 1120 Connecticut Ave NW Ste 900 Washington DC 20036-3920 Kathleen Pickering: 202 857 0166 www.nfwf.org	Non-profit organizations, local, state or federal government agencies are eligible to apply for funds for community-based projects that improve and restore native salmon habitat, remove barriers to fish passage, or for the acquisition of land/ conservation easements on private lands where the habitat is critical to salmon species. Proposals should focus on building local partnerships to implement on-the-ground restoration projects. Throughout the year they also provides many types of challenge grants to assist priority fish, wildlife, and plant conservation programs.
Ben & Jerry's Foundation 30 Technology Drive Suite 1 South Burlington VT 05403 Rebecca Golden: 802 651 9600	Grants awarded quarterly for children and families, disenfranchised groups, and the environment. Grants focus on grassroots models that can demonstrate a plan for long-term viability, strengthen and support self-empowerment efforts, and lead to new ways of thinking. Grants are awarded to incorporated 501(c)(3) organizations only. Call or write for application materials.
The Brainerd Foundation 1601 2nd Ave Suite 610 Seattle WA 98101-1541 206 448 0676 / fax 206 448 7222 www.brainerd.org info@brainerd.org	The foundation has three environmental programs: Endangered Ecosystems, Toxics and Communities, and Communications and Capacity Building. The foundation's fields of interest are natural resource conservation and protection. Call or write for application materials.

The Bullitt Foundation
1212 Minor Ave
Seattle WA 98101-2825
Emory Bundy, Program Director: 206 343 0807
www.bullitt.org
info@Bullitt.org

Gives grants to a variety of environmental projects in the Pacific Northwest. These include projects that leads to the protection and preservation of mountains, forests, rivers, wetlands, coastal areas, soils, and fish and wildlife. Call or write for application materials. Deadlines: April 1, August 1, and December 1.

The Compton Foundation
545 Middlefield Road Suite 178
Menlo Park CA 94025-3400
650 328 0101

Grants are awarded for public education, fish habitat, and public policy in natural resource management, with a focus on watershed protection and long-term habitat and ecosystem preservation and restoration. Grants are awarded to incorporated 501(c)(3) organizations only. Call or write for application materials.

The Conservation Alliance
c/o Recreational Equipment Inc
PO Box 1938
Sumner WA 98390-0880
David Jayo, Grants Administrator: 253 395 5958
www.outdoorlink.com/consall

The alliance is a group of 65 outdoor businesses whose collective contributions support grassroots citizen-action groups and their efforts to protect wild and natural areas. Provides small and large grants (around $30,000) to groups working nationally to protect rivers and public land. Possible source for hands-on projects. Call to request application materials.

FishAmerica Foundation
1033 N Fairfax St Ste 200
Alexandria VA 22314-1540
703 548 6338 / fax 703 519 1872

This organization supports small projects designed to enhance fish populations such as habitat enhancement and water quality improvement projects. Write for materials if interested. Applications should be made approximately one year in advance of anticipated need for funding.

Harder Foundation
401 Broadway
Tacoma WA 98402-3900
Del Langbauer, President, or
Judy Loomis-Grover, Office Manager: 253 593 2121
HARDERFNDN@aol.com

This is a small foundation. It funds environmental action projects in support of habitat protection, especially prime habitat areas facing immediate threats on public lands. It also funds river protection work. A very small portion of the Harder Foundation's grants involve acquisition of natural areas, especially when they are of regional biological significance. Forty percent of their grants in aggregate are made to grantees in the states of Washington and Oregon. Write for "Guidelines for Grant Proposals." Proposals must be received by June 2 and August 15

Kongsgaard-Goldman Foundation
1932 1st Ave Ste 602
Seattle WA 98101-2447
Martha Kongsgaard: 206 448 1874
KGFound@aol.com

Provides between $1,000-$15,000 for habitat protection and restoration formation of watershed councils, citizen involvement, public education, and sustainable development. Applications are due Sept. 16, with pre-applications due March 30 and Oct. 31

Northwest Fund for the Environment
1904 3rd Ave Ste 615
Seattle WA 98101-3326
Zoe Rothchild or Pam Sujita-Yuhas, Fund Administrator: 206 386 7220
www.nwfund.org
staff@nwfund.org

This group gives grants for environmental purposes, including grants for stewardship programs, action plans, strategic litigation, and capacity building for conservation organizations. It also gives grants for protection of wildlife habitats, water quality, sustainable forestry, and shoreline and wetland environments. Call or email for agency guidelines and application form. Complete applications are due the third week in February and the third week in August. Check the web page for more information and application. They only fund in Washington.

Restore America's Estuaries
estuaries@mindspring.com
www.estuaries.org/funding.html

Restore America's Estuaries has a compendium of federal funding sources for estuarine restoration, available at their website.

The involvement of volunteers from the community will greatly enhance the success of the Duwamish Riverfront Revival —especially in caring for new landscaping during the early years while plants put down roots. The community has designed this project, and this involvement will be continued by providing opportunities for volunteers to be involved in planting or other early-stage activities.

Since this project takes place on public and private property, it will require a unique balance of landowner participation in stewardship activities and volunteer access to the project. In areas where public access is restricted, private landowners will have to take responsibility for monitoring and stewarding the project.

Proper stewardship includes:

- Making sure that plants are watered and weeded as they mature.
- Watching for signs of problems such as predation or vandalism.
- Documenting the progress of the project with photos and data.

A community-based stewardship system can be built using an existing estuarine habitat monitoring protocol such at People For Puget Sound's Volunteer Salmon Habitat Restoration Monitoring Program (VSHRMP). Such a program can provide training and management of volunteer stewards, as well as a web page with maps, photos, and monitoring data.

The VSHRMP program begins with a site map (see example above) that outlines the different features of the project as they actually were constructed. From this base map, points are set for taking regular pictures and gathering information on bird usage and plant survival. The map and data then become part of a web page that provides a community forum for tracking the success of the project over time.

For more information on this program, see www.pugetsound.org.

1999: Earth Corps youth crews provide leadership for volunteers as they plant this new wetland on the Duwamish.

2000: Bruce Clifton, volunteer site steward, visits the site regularly to gather data and check its progress.

2001: The result of citizen stewardship: a healthy new marsh in just two years.

environmental review & permitting strategy

Working below the high water line triggers a number of permits. These are outlined in the following table. As noted in the table, many of these are concurrent processes, but completing them in a timely fashion requires planning ahead. The permits are generally issued in the order listed in the table below, beginning with the SEPA environmental review process, local permits, state permits, and proceeding to the federal level. This is one reason why the federal permits take the longest to obtain.

Approval	Jurisdiction	Material Requirements for Application	Review & Approval Timeframe
SEPA	King County (with notice to the City of Seattle)	**Material Requirements:** • Detailed project description & location, including vicinity map and site map • Detailed site information related to potential impact areas: earth; surface water quality; aquatic habitat; hazardous materials • (Refer to biological evaluation for information on listed species)	2-3 months for checklist 3-6 months total, including public comment period
Shoreline Permit, Grading, Demolition, and Critical Areas	King County (with notice to the City of Seattle) Department of Development and Environmental Services	**Documentation:** Joint Aquatic Resources Application (JARPA) **Material Requirements:** Standard JARPA materials: • Detailed project description & location, including vicinity map and site map • Detailed information on construction methods, fill material and quantities, decking/piling material descriptions • Landscape plan • Design drawings (conceptual level okay) including plan view and cross-sections at shoreline areas • Adjacent property owner contact information	6-9 months, including public comment period (concurrent with SEPA)
Hydraulic Project Approval	Washington Department of Fish & Wildlife	**Documentation:** Joint Aquatic Resources Application (JARPA) **Material Requirements:** • Standard JARPA materials • Copy of mitigation plan • May request copy of biological assessment	3-6 months (concurrent with permit above)
401 Water Quality Certification	Washington Department of Ecology	**Documentation:** Joint Aquatic Resources Application (JARPA) **Material Requirements:** • Standard JARPA materials • May require copy of Temporary Turbidity Control Plan for in-water construction activities, as well as Stormwater Pollution Prevention Plan	6-8 months (concurrent with permits above)
Section 404 and Section 10 permits	U.S. Army Corps of Engineers	**Documentation:** Joint Aquatic Resources Application (JARPA) **Material Requirements:** • Standard JARPA materials	12-18 months (length primarily due to ESA consultation) (concurrent with permits above)
Endangered Species Act Compliance	U.S. Fish & Wildlife Service National Marine Fisheries Service	**Documentation:** Joint Aquatic Resources Application (JARPA) **Material Requirements:** • Biological Evaluation, including scientific characterization of existing habitat, effect of proposed action on listed species, and Evaluation of impacts to Essential Fish Habitat	12-18 months (concurrent with permits above)

If the project proceeds as an independent habitat restoration project, the King County and Washington State Fish and Wildlife Department (WDFW) permitting processes are streamlined. If it is tied into larger projects as mitigation it will need to follow the permit review process for that project causing the impact.

In addition to environmental review and permitting there is coordination that would be needed to implement the project on Port of Seattle property and King County Right-of-Way. The following is a summary of Coordination Items assuming that the project proceeds as part of unincorporated King County:

Agency	Coordination Items
King County Transportation, Road Services Division (206) 684-1481	Creation of swales and sloughs and reconstruction of streets in King County right of way, including emergency access requirements (fire & police)
King County Health Services (206) 296-4932	Regrading on Port of Seattle Property where septic drainfields may be disrupted.
Seattle Public Utilities (206) 684-5950	Relocation of water services to residences and for fire protection (hydrants) where streets are rebuilt to accommodate swales and sloughs.
Seattle City Light (206) 386-4200	Relocation of power poles affected by regrading at the ends of streets to restore habitat.
King County Department of Development and Environmental Services (206) 296-6600	Coordinate with other King County agencies throughout the project.

Phasing

The **first phase** of the Duwamish Riverfront Revival includes all parts of the project that could be initiated immediately. These include the portions of the project that do not impact septic drain fields of riverfront homes. This is primarily the Port of Seattle land adjacent to the non-residential properties such as streetends, the marina, and the industrial property. This is also King County land at the street ends that could become street sloughs. Some areas of residential property could be included in this phase if these areas were determined to not contain septic drainfields.

The **second phase** of the Duwamish Riverfront Revival includes the street swales that extend the riverfront project deeper into neighborhood. This intervention would be best timed to accompany the tearing up and replacement of roads to provide sewers to the neighborhood. Developing the street swales would also require collaboration with and consent of a broader group of neighbors than has currently been involved.

The **third phase** of the Duwamish Riverfront Revival includes the parts of the project that might impact septic drainfields of riverfront homes. This will require a solution to the septic issue, either through the County sewering these homes and negotiating an attachment to the City's lines or through annexation and sewering by the City. A local treatment solution such as "living machines" is another potential solution. This is primarily the Port of Seattle land adjacent to residential properties and some residential property.

King County Executive
RON SIMS

November 27, 2001

William Ruckelshaus
Salmon Recovery Funding Board
1111 Washington Street SE
P.O. Box 40917
Olympia, WA 98504-0917

Dear Mr. Ruckelshaus:

I am writing to express my support of the South Park/Duwamish Habitat Revival Project. I ask that you provide funding for this important project.

This revival project will be a great addition to the restoration of the lower Duwamish River. As we all know, this stretch of river is in need of help. This project seeks to benefit juvenile salmon by protecting and restoring shallow water habitat in the Duwamish River estuary.

Almost the entire shallow water habitat has been destroyed in this reach of the river since shoreline uses in the project vicinity are industrial. Though we now have good habitat upstream around the Turning Basin and downstream around Kellogg Island, this reach is lacking habitat. This project will start the development of habitat between those two major projects. This project also starts the development of shallow water habitat "steppingstones" for use by outgoing juvenile salmon seeking refuge and food.

Shallow water habitats have been identified as crucial to the survival of outmigrating juvenile salmon by providing predator refuge and terrestrial and aquatic food resources. This project provides the highly needed shallow water habitat.

To the project's further credit, it has been forged by a unique and wide-ranging partnership. ECOSS has developed this project along with the Port of Seattle, King County, the City of Seattle, private landowners, the South Park Business Association and the South Park Neighborhood. The project concept plan was developed with extensive neighborhood involvement and has strong community support. The project is one of the first to be developed on a combination of private and public land, with no funds necessary for land acquisition

KING COUNTY COURTHOUSE 516 THIRD AVENUE, ROOM 400 SEATTLE, WA 98104-3271
(206) 296-4040 296-0194 FAX 296-0200 TDD E-mail ron.sims@metrokc.gov

Thank you for your consideration. King County supports the South Park/Duwamish Habitat Revival Project and we ask you to do so as well. I encourage you to give this project the maximum amount of funding available.

Sincerely,

Ron Sims
King County Executive

Greg Nickels
Metropolitan King County Council
District Eight

December 3, 2001

William Ruckelshaus
Washington State Salmon Recovery Funding Board
Salmon Recovery Funding Board
1111 Washington Street SE
P.O. Box 40917
Olympia, Washington 98504-0917

Dear Mr. Ruckelshaus:

I am writing in support of the South Park/Duwamish Habitat Revival Project and I urge you to provide funding for it.

The Revival Project is the next best step in the restoration of the lower Duwamish River, a stretch that is in dire need of restoration. The project's goal is to benefit juvenile salmon by protecting and restoring shallow-water habitat in the Duwamish River estuary where they make the physiological transition to saltwater.

This unique project will kickstart the development of habitat and also starts the development of shallow water habitat "stepping stones" for use by outgoing juvenile salmon seeking refuge and food.

Shallow-water habitats have been identified as crucial to the survival of out-migrating juvenile salmon by providing predator refuge and terrestrial and aquatic food resources. The project provides the highly needed shallow-water habitat.

This project exemplifies community and government partnership by bringing together ECOSS, the Port of Seattle, King County, the local community, the local business association and private landowners with extensive involvement by the City of Seattle. The project concept plan was developed with extensive neighborhood involvement and has strong community support. The project is one of the first to be developed on a combination of private and public land, with no funds necessary for land acquisition.

This project is in my former King County Council district and will be a boon to both King County and Seattle. Please give this project the maximum amount of funding available. Thank you.

Sincerely,

GREG NICKELS
Councilmember

Room 1200, King County Courthouse, 516 Third Avenue, Seattle, WA 98104-3272
(206) 296-1008 FAX (206) 296-0198 TTY/TDD (206) 296-1024

Dwight Pelz
Metropolitan King County Council
District Five

November 27, 2001

William Ruckleshaus
Chairman, Washington State Salmon Recovery Funding Board

Dear Mr. Ruckleshaus,

I support the South Park/Duwamish Habitat Revival Project and I ask you to provide funding for it.

This project will be a great addition to the restoration of the lower Duwamish River. As we all know, this stretch of river needs help. The project seeks to benefit juvenile salmon by protecting and restoring shallow water habitat in the Duwamish River estuary.

Almost the entire shallow water habitat in this reach of the river was destroyed by industrial uses of the shoreline. We now have good habitat upstream around the Turning Basin and downstream around Kellogg Island, but this reach is lacking habitat. This project will create continuity between those two major projects. This project also starts the development of shallow water "steppingstones" for outgoing juvenile salmon seeking refuge and food.

Shallow water habitats have been identified as crucial to the survival of outmigrating juvenile salmon by providing predator refuge and terrestrial and aquatic food resources. The project provides the highly needed shallow water habitat.

To the project's further credit it has been forged by a unique and wide-ranging partnership. ECOSS has developed this project with the Port of Seattle, King County, the City of Seattle, private landowners, the South Park Business Association and the South Park Neighborhood. The project concept plan was developed with extensive neighborhood involvement and has strong community support. The project is one of the first to be developed on a combination of private and public land, with no funds necessary for land acquisition

King County supports the South Park/Duwamish Habitat Revival Project and we ask you to do so as well. Please fund this project.

Thank you

Dwight Pelz

Room 1200, King County Courthouse, 516 Third Avenue, Seattle, WA 98104-3272
(206) 296-1005 TTY/TDD (206) 296-1024 FAX (206) 205-5611

City of Seattle
Paul Schell, Mayor
Office of the Mayor

November 20, 2001

To Whom It May Concern:

We are writing to support the South Park/Duwamish Habitat Revival Project, and we urge you to provide funding for this important project.

The Revival Project is the next best step in the restoration of the lower Duwamish River, a stretch that is in dire need of restoration. The project's admirable goal is to benefit juvenile salmon by protecting and restoring shallow water habitat in the Duwamish River estuary where they make the physiological transition to saltwater.

Almost all of the shallow water habitat has been destroyed in this reach of the river — since shoreline uses in the project vicinity are industrial, they offer limited shallow water habitat. Shallow water habitats have been identified as crucial to the survival of outmigrating juvenile salmon by providing predator refuge and terrestrial and aquatic food resources. While there is good habitat upstream at the Turning Basin and downstream at Kellogg Island, this particular reach is sorely lacking. This unique project will kickstart the development of habitat between those two major projects, in addition to developing shallow water habitat "steppingstones" for use by outgoing juvenile salmon seeking refuge and food.

The Revival Project is a partnership between ECOSS, the Port of Seattle, King County, and private landowners, with extensive involvement by the City of Seattle. The project concept plan was developed with widespread neighborhood involvement and has strong community support; it is one of the first to be developed on a combination of private and public land, with no funds necessary for land acquisition. Most importantly, the project provides the much-needed shallow water habitat for salmon to thrive.

The City of Seattle supports the South Park/Duwamish Habitat Revival Project, and we ask you to do so as well. Please give this project the maximum amount of funding available.

Thank you for your time and consideration.

Very truly yours,

Paul Schell

600 Fourth Avenue, 12th Floor, Seattle, WA 98104-1873
Tel: (206) 684-4000, TDD: (206) 684-8811, Fax: (206) 684-5360, E-mail: mayors.office@ci.seattle.wa.us

Margaret Pageler
President, Seattle City Council

November 27, 2001

William J. Ruckelshaus, Chairman
Washington State Salmon Recovery Funding Board

RE: **South Park/Duwamish Habitat Revival Project**

Dear Bill:

I am writing in support of the South Park/Duwamish Habitat Revival Project and I urge you to provide funding for it.

As I see it, the Revival Project is the next best step in the restoration of the lower Duwamish River, a stretch that is in dire need of restoration. The project's admirable goal is to benefit juvenile salmon by protecting and restoring shallow water habitat in the Duwamish River estuary where they make the physiological transition to saltwater. Shallow water habitats have been identified as crucial to the survival of outmigrating juvenile salmon by providing refuge from predators and terrestrial and aquatic food resources. It is well known that almost all of the shallow water habitat has been destroyed in this reach of the river since shoreline uses in the project vicinity are industrial, offering limited shallow water habitat.

This project also starts the development of shallow water habitat "steppingstones" for use by outgoing juvenile salmon seeking refuge and food. There is good habitat upstream at the Turning Basin and downstream at Kellogg Island, but this reach is lacking habitat. This unique project will kickstart the development of habitat between those two major projects.

Furthermore, this project is a partnership among ECOSS, the Port of Seattle, King County, and private landowners with significant involvement by the City of Seattle. The project concept plan was developed with extensive neighborhood involvement and has strong community support. The project is one of the first to be developed on a combination of private and public land, with no funds necessary for land acquisition

The City of Seattle supports the South Park/Duwamish Habitat Revival Project and we ask you to do so as well. Please give this project the maximum amount of funding available. Thank you.

Sincerely,

Margaret Pageler
President, Seattle City Council
Chair, Water Resources Committee

1100 Municipal Building, 600 Fourth Avenue, Seattle, WA 98104-1876
(206) 684-8807, Fax: (206) 684-8354, TTY: (206) 233-0025, E-Mail Address: margaret.pageler@ci.seattle.wa.us
Internet Address: http://www.ci.seattle.wa.us/leg/pageler

Nick Licata
Seattle City Councilmember

Charlie Cunniff
ECOSS
8201 10th Ave S
Seattle WA 98108

Dear Charlie,

I am writing in support of the South Park/Duwamish Habitat Revival Project. I encourage you in your campaign to develop project funding.

The lower Duwamish River is in dire need of restoration. This project is an important step in its restoration. The goals of this project are to protect and restore shallow water habitat in the Duwamish River estuary thereby benefiting juvenile salmon. This is the kind of project we need in urban estuaries.

Shallow water habitats have been identified as crucial to the survival of outmigrating juvenile salmon by providing predator refuge and terrestrial and aquatic food resources. This project provides the highly needed shallow water habitat. We know that nearly all shallow-water habitat has been destroyed in this section of the river. Shoreline uses in the project vicinity are industrial, offering limited shallow water habitat. Though there is good habitat upstream and downstream, this area is lacking habitat. I hope that this unique project will spur the development of shallow water habitat "steppingstones" for use by outgoing juvenile salmon seeking refuge and food.

At the project kickoff meeting this summer, I was impressed by the partnership you had developed. Representatives from the City of Seattle, King County, the Port of Seattle, businesses, residents, neighborhood activists, environmentalists and private landowners were actively engaged in your efforts. This is evidence of an impressive collaborative campaign. The extensive neighborhood involvement and strong community support of this plan is critical to the success of such a project.

Projects like this help build neighborhoods while helping salmon habitats. Moreover, they help build broad-based community-wide support for salmon, which is crucial at this time. We support your efforts to acquire funding for this project.

Sincerely,

Seattle City Councilmember Nick Licata

1100 Municipal Building, 600 Fourth Avenue, Seattle, WA 98104-1876
(206) 684-8803, Fax: (206) 684-8587, TTY: (206) 233-0025, E-Mail Address: nick.licata@ci.seattle.wa.us Internet Address: http://www.pan.ci.seattle.wa.us/leg/licata/licata.htm

SOUTH PARK AREA REDEVELOPMENT COMMITTEE
(SPARC)
8201 10TH AVE S
SEATTLE WA 98108
(206) 767-3650

11/21/01

RE: South Park/Duwamish Habitat Revival Project

Dear Charlie,

SPARC supports the South Park/Duwamish Habitat Revival Project and look forward to its construction. We have been to all the workshops and think this is a great project. The coalition of diverse interests that are supporting the project is keeping with the ECOSS tradition.

It is wonderful to we see a development with partners such as ECOSS, the Port of Seattle, King County, the City of Seattle, private landowners, the South Park Business Association and the South Park Neighborhood. This project will further solidify our neighborhood, at a time where neighborhoods need help. There are other neighborhood projects happening right now, as you know. This project adds to the complexity of the mix and will help galvanize neighborhood support for the salmon.

We worked with you on the project concept plan along with many others in neighborhood and community. We are happy to participate, knowing that the project is one of the first to be developed on a combination of private and public land, with no funds necessary for land acquisition

This project will be a great addition to the restoration of the lower Duwamish River, a great boost to salmon restoration and a significant addition to the South Park neighborhood. But, in addition to it being a great physical addition, it will be a great inspirational addition to the people who live and work here. We think it will inspire them towards a deeper understanding and deeper support for salmon and habitat restoration

SPARC applauds you efforts and supports the South Park/Duwamish Habitat Revival Project and we support your efforts to find available funding.

Thank you for your efforts and for the efforts of the community on this and other projects.

Sincerely,

Nigel Day
SPARC Chair

SPBA

SOUTH PARK BUSINESS ASSOCIATION

P.O. Box 81435 • Seattle, WA 98108-1335 • Phone: (206) 767-5843 • Fax: (206) 764-3996

November 27, 2001

To Whom It May Concern:

RE: South Park/Duwamish Habitat Revival Project Funding

The South Park Business Association supports the South Park/Duwamish Habitat Revival Project and we ask that you provide funding.

This project will no doubt be a great addition to the restoration of the lower Duwamish River. As we all know, this stretch of river needs help. The project seeks to benefit juvenile salmon by protecting and restoring shallow water habitat in the Duwamish River estuary. Almost the entire shallow water habitat has been destroyed in this reach of the river since shoreline uses in the project vicinity are industrial. Although we now have good habitat upstream around the Turning Basin and downstream around Kellogg Island, this reach is lacking habitat. This project will start the development of habitat between those two major projects. It will also start the development of shallow water habitat "steppingstones" for use by outgoing juvenile salmon seeking refuge and food. Shallow water habitats have been identified as crucial to the survival of outmigrating juvenile salmon by providing predator refuge and terrestrial and aquatic food resources. The project provides the highly needed shallow water habitat.

To the project's further credit, it has been forged by a unique and wide-ranging partnership. ECOSS has developed this project with the Port of Seattle, King County, the City of Seattle, private landowners, the South Park Business Association and the South Park Neighborhood. The project concept plan was developed with extensive neighborhood involvement and has strong business and community support. The project is one of the first to be developed on a combination of private and public lands, with no funds necessary for property acquisition.

King County supports the South Park/Duwamish Habitat Revival Project and we ask you to do so as well. Please give this project the maximum amount of funding available.

Thank you

Sincerely,
SOUTH PARK BUSINESS ASSOCIATION

Mike Cassidy
President

MC:mr

"South Park Means Business"

Port of Seattle

November 28, 2001

Mr. Charlie Cunniff
Environmental Coalition of South Seattle
8201 – 10th Avenue South
Seattle, WA 98108-4409

Re: South Park/Duwamish Habitat Revival Project

Dear Charlie,

Thank you for engaging Port of Seattle staff in planning for this important salmon habitat restoration project in the Duwamish estuary. The proposed restoration project represents a fine opportunity for citizens and government entities and agencies to work cooperatively to demonstrate the compatibility of salmon habitat and continuing residential and industrial activity in an urban environment. As you know, The Port of Seattle has been active in efforts to restore aquatic habitat conditions important to salmon throughout King County and particularly in the Duwamish estuary. In the past ten years, Port of Seattle sponsored aquatic habitat restoration and enhancement projects in south Elliott Bay and the Duwamish estuary have produced approximately 5.5 acres of nearshore and estuarine salmon habitat at nine sites.

We whole-heartedly support the efforts of ECOSS and the South Park folk in this initiative. This a fine opportunity to enhance the migratory path of our salmon runs. Also of great significance is this demonstration of the synergistic effect found in a scientifically well founded and grass roots based initiative to truly make a difference. Along with our colleagues at King County and the City of Seattle, we look forward to joining with you, your South Park business and residential neighbors and the hard working activists in our environmental advocacy community to continue ongoing work in the Duwamish for environmental stewardship and salmon enhancement.

Sincerely,

Tom Tierney
Deputy, CEO

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Timothy and Deborah McNeil
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Nov. 26, 2001
To Whom It May Concern:
RE: South Park/Duwamish Habitat Revival Project Funding

When we purchased property along the Duwamish Waterway, we wondered if anything could be done along our shoreline to help the endangered salmon. After studying its steep rubble bank we concluded that was probably impossible. Therefore, when Charlie Cuniffe of ECOSS asked us if we would be interested in participating in a habitat restoration project, we were delighted and signed on immediately.

This project already has made a great contribution to our neighborhood. We have been assisted and encouraged by representatives from the City, the County, and the Port of Seattle. The community meetings organized by the design team have served to teach us a great deal about river habitat and fish needs. They have heightened our awareness of the importance of taking care of the river and all its organisms. People have become more observant of the fish, the birds, and marine mammals who live in the river.

We have learned from the community programs that young salmon need shallow water in which to rest, feed, and hide from larger predators. They need native shore plantings which shade the water and support large populations of insects. We have gone to look at projects already completed, at Hamm Creek and Herrings House Park, and we are excited at the possibilities for rehabilitating more of the shoreline to provide steppingstones for the fish between these other projects.

As we watch the river through each season of the year, we are amazed at the variety of creatures that survive in it in spite of the hostile shoreline. It is thrilling to contemplate how much better it will be when the shoreline habitat is restored. Children in the neighborhood spend hours playing by the river; think how much fun it will be to involve them in replanting the riverbank so they too will have a stake in its future.

The South Park neighborhood is undergoing a real renaissance right now. Previous community activities have already built up a corps of enthusiastic, hard-working residents who want to make this a better place. I know they will support this project wholeheartedly with volunteer labor and stewardship. We personally will support it with a contribution of some of our land, and a promise of stewardship into the future. Please help us make this happen.

Sincerely,

Timothy and Deborah McNeil

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July 18 Vision Report Presentation and Riverfront BBQ

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For all the troubles they face, salmon still inhabit the soul of the Pacific Northwest. The fish leave their imprint on the place where we live. In diminished numbers they nonetheless connect ocean denizens and land dwellers in a bond that has been recognized since the days of the first peoples. Just as salmon once brought food for bear, human, and fir tree to the furthest reaches of our watersheds, they tantalize today with the dream of a place in which people can harvest what we need and stand back while the rest of the wild fulfills its own destiny.

—Seth Zuckerman
in *Salmon Nation: People and Fish at the Edge*