

DUWAMISH

A RIVER LOOM

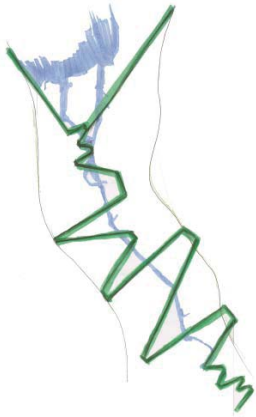
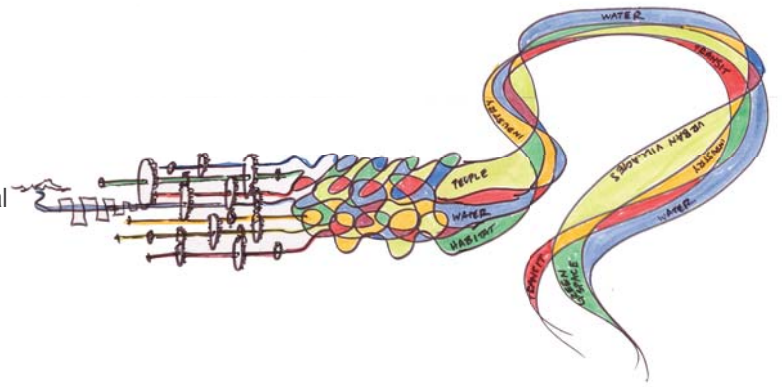
Team Leaders: Mark Johnson, Jim Brennan
Student Team Members: Kari Stiles, Melissa Martin
Team Members: Cari Simson, Karen Janosky, Dottie Faris, James Rasmussen,
Sarah Kavage, Eric Higbee, Tom Knaublaugh, Scott Holsapple



THE DUWAMISH WATERSHED

A River Loom

Interdependent threads of activity and land use are woven together across the Duwamish Valley to create a rich landscape fabric that supports a dynamic interaction of industrial, residential and ecological activity. The unique industrial and ecological histories of the Duwamish Watershed are recognized, enhanced and their interactions strengthened through the development of integrated transit and habitat corridors and focused density and new development.



Zipper

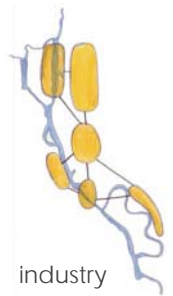
Just as the interlocking teeth of a zipper bring two disparate elements together to form a greater, stronger whole, this plan knits the east and west Duwamish landscapes together along the seam of the Duwamish River. Industrial and ecological landscapes, human and wildlife uses, as well as the movement of humans and physical forces come together along the banks of the Duwamish and along the flanking greenbelts.



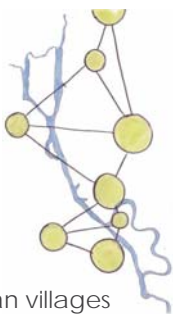
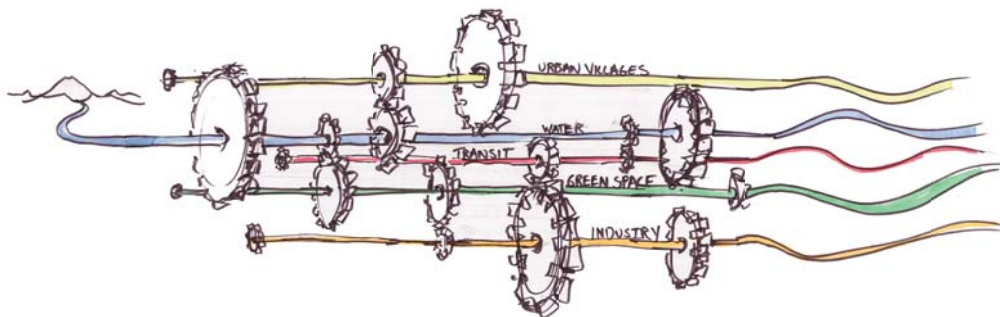
transportation

Axles and Gears

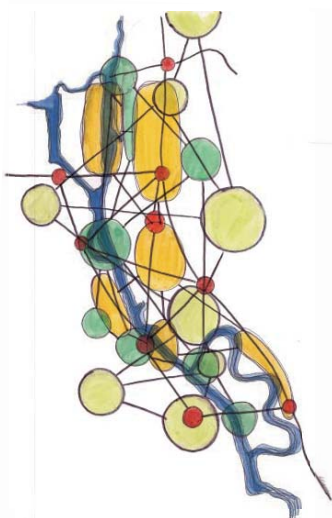
Powered by the water of the Duwamish, the axles of industry, habitat, transit and human activity interact to drive and shape one another. Industry that is water dependent is woven into the banks of the river in a way that supports industrial needs and ecological functions, cleans the environment and provides wildlife habitat. Open spaces that provide recreational and educational opportunities are located near population centers. Transit corridors provide easy access to industry and population centers while also celebrating and reinforcing green connections and habitat corridors.



industry

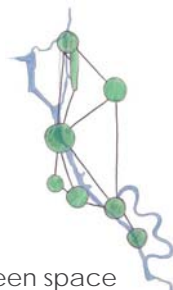


urban villages



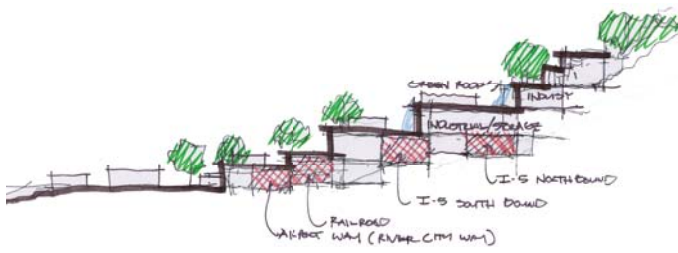
A Braided Fabric

The axles of the Duwamish are woven together to produce a flexible, diverse, strong and adaptable fabric that is rooted in the hydrological and ecological foundations of the watershed. Beads of development (habitat, industry, commercial and residential) are encouraged where their habitat, transit, human and spatial requirements are optimized. Rooted in the immediate local environment, a shift to environmentally-focused land use and development will lead to a strong, locally-appropriate, diverse urban fabric that both restores the ecological health of the landscape and allows for punctuated change as needs and conditions shift.



green space

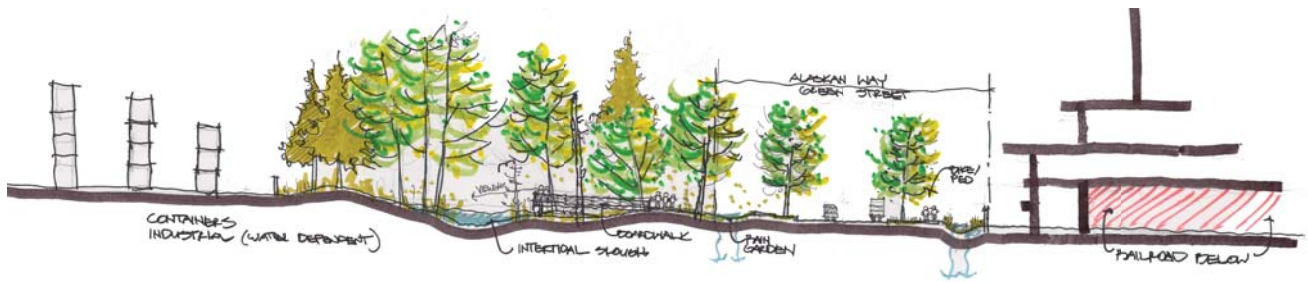
Charrette Conceptual Plans



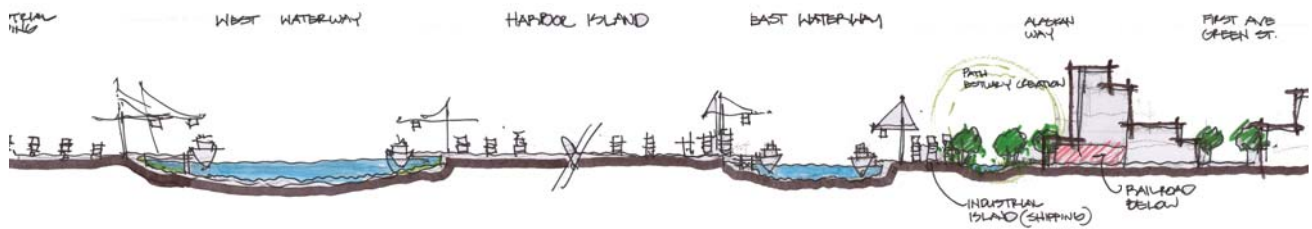
Terraced development



Charrette 100 year plan



Alaskan Way container canyon



River mouth area



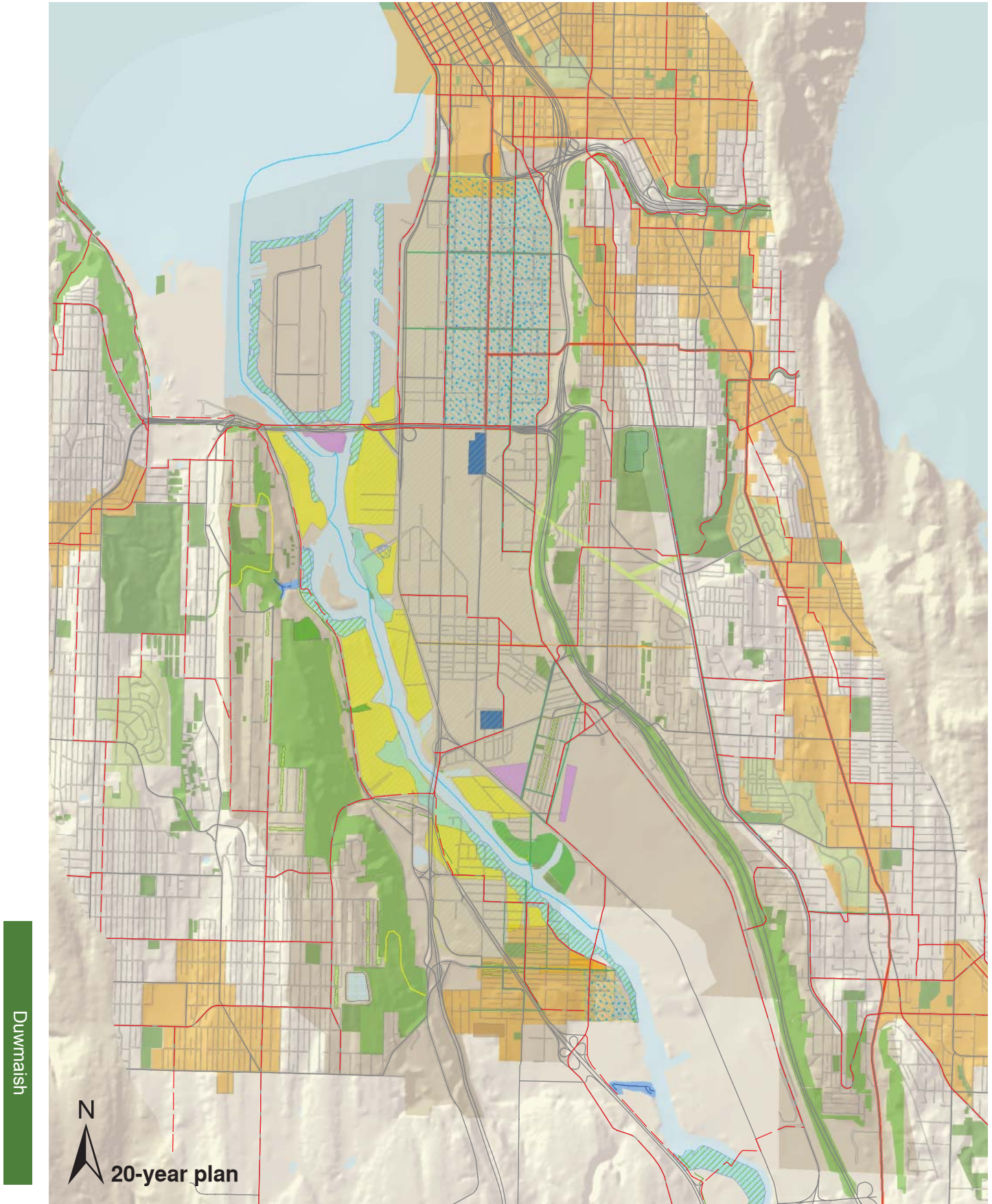
Kellogg Island



New river channel

Duwamish

PLANNING FOR 20 YEARS



20-year priorities

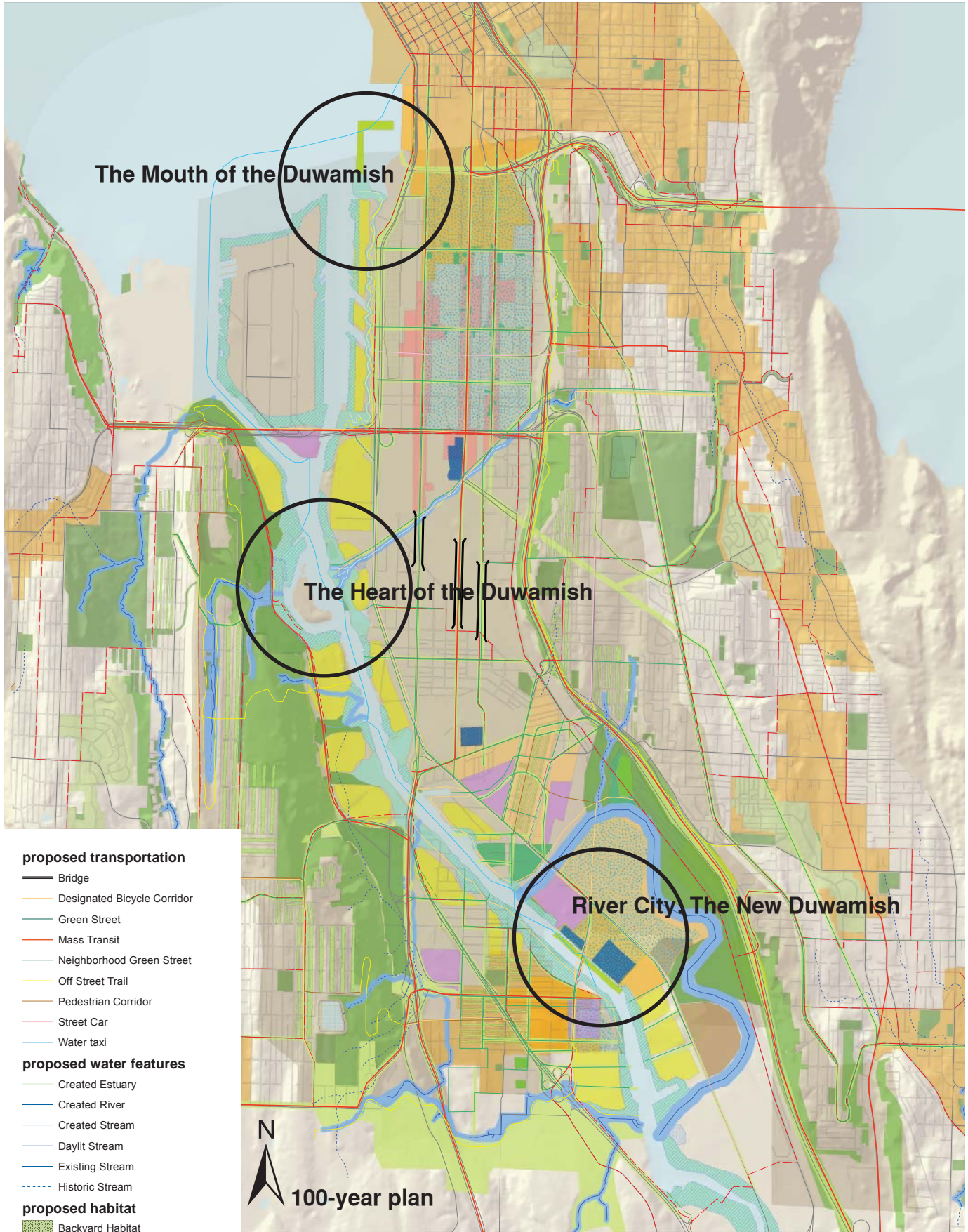
Transportation

- Build a green street network
- Build a transit network
 - light rail
 - Souder
- Reconnect neighborhoods
 - I-5/I-90 lid
- Replace 14th Avenue bridge
- Lid SR 99 at West Marginal
- Build a trail network
- Finish Chief Sealth trail
 - East Duwamish greenbelt trail
 - Puget and Longfellow creek trails
- Add water transportation
 - water taxi to Duwamish
 - small craft landings

Habitat

- Soften edges of Harbor Island
 - East waterway habitat restoration
- Expand Herrings House/T107 to the south
- Bring Puget creek back to the Duwamish
- Create shallow water habitat on east side of Kellogg Island
 - Diagonal restoration and CSO treatment facility
- Continue to soften river banks; remove riprap
 - Gateway North intertidal habitat
- Create viewing area at old pump house
- Create paths along river
- Add intertidal habitat throughout salt/freshwater wedge along both sides of river
- Open mouth of Hamm Creek for intertidal habitat and create viewing areas

LOOKING FORWARD 100 YEARS,



proposed transportation

- Bridge
- Designated Bicycle Corridor
- Green Street
- Mass Transit
- Neighborhood Green Street
- Off Street Trail
- Pedestrian Corridor
- Street Car
- Water taxi

proposed water features

- Created Estuary
- Created River
- Created Stream
- Daylit Stream
- Existing Stream
- Historic Stream

proposed habitat

- Backyard Habitat
- CSO Living Machine
- Estuary
- Habitat Corridor
- Mixed Forest
- Puget Sound Riparian Area
- Stream Riparian Area
- Urban Waterfront Habitat

proposed water and drainage

- Green Roof
- Rain Garden
- Rain Plaza

proposed community amenities

- Active Park
- Civic Space
- Lidded Open Space
- Passive Park
- Urban Agriculture

proposed urban centers

- Commercial Area
- Industrial Area
- New Urban Hub
- New Urban Village
- Urban Corridor

existing areas

- existing gardens
- existing greenbelts
- existing park
- existing urban villages

existing habitat

- existing habitat

existing trails

- existing arterials
- existing bike trails
- existing trails

duwamish study area

- duwamish study area

duwamish buffer area

- duwamish buffer area

Strategies and implementation

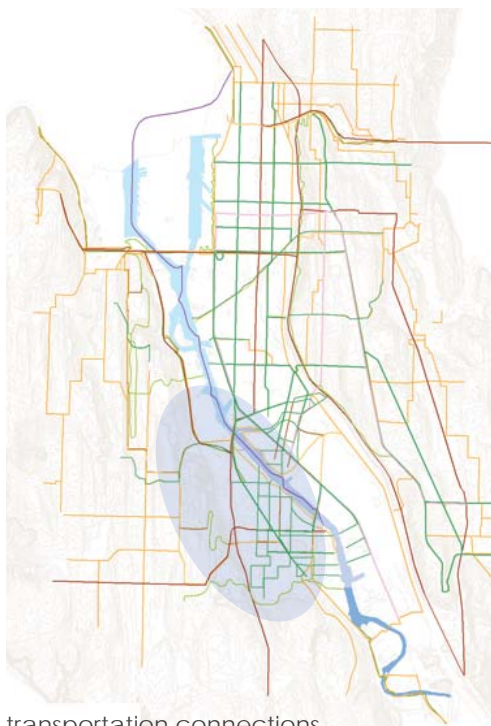
- Percent of State Sales Tax applied to lidding regional transportation corridors
- Increase incentives for Transfer of Development Rights and Conservation Easements to increase designated habitat acreage
- Develop citywide financial incentives to encourage implementation of Green Energy Technology and Sustainable Development (i.e. wind, microhydro, solar, green roofs)
- Public Purchase of waterfront and greenbelt parcels to create continuous terrestrial and waterfront habitat corridors
- Use Real Estate Excise Tax to develop public open space amenities (i.e. parks, green streets, rain gardens and green roofs)
- Develop transportation networks that facilitate industrial development in non critical (i.e. non-waterfront) habitat areas

Unfolding Landscapes Across the Duwamish.

Exploring Multi-Use and Mobile Spaces along the 8th Avenue Corridor



industrial, commercial, residential



transportation connections



habitat connections

ACTIVITY

3 zones of the Duwamish

industrial zone

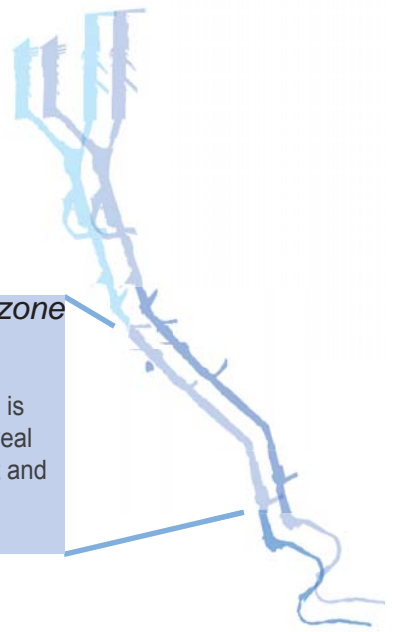
- local development focuses on providing opportunities for water-based industry\habitat is seamlessly integrated into industrial infrastructure

integration zone

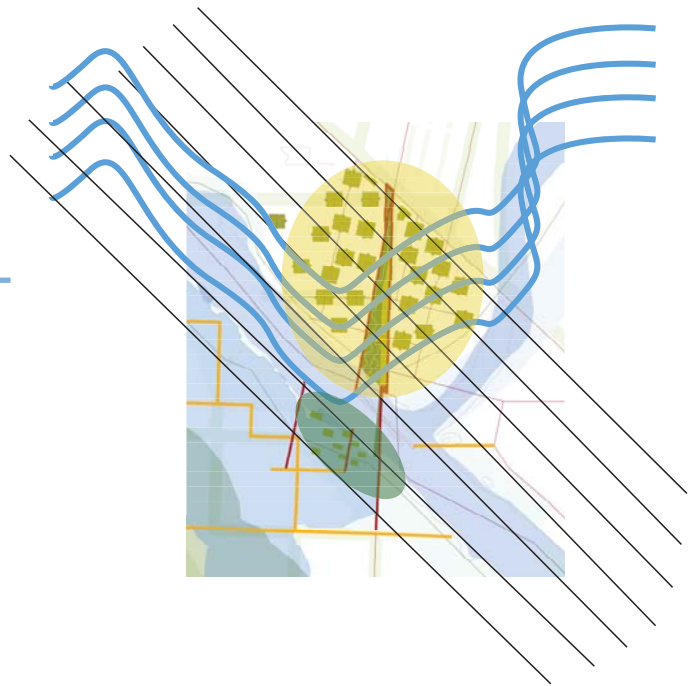
- human access to the river is prioritized
- natural and built infrastructure is integrated and exposed to reveal interactions between the built and natural environment

habitat zone

- all development prioritizes restoration of Duwamish River
- habitats and processes

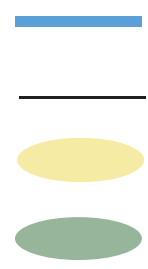


ENERGY



local energy harvest powers new developments

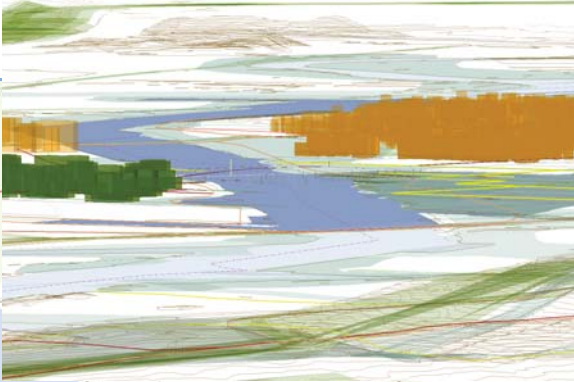
- microturbines use water running under new developments to power local neighborhoods
- wind is harvested on rooftops and across the Duwamish
- solar energy is captured on rooftops of all new developments
- green fuel is produced in local wetland and terrestrial nursery beds



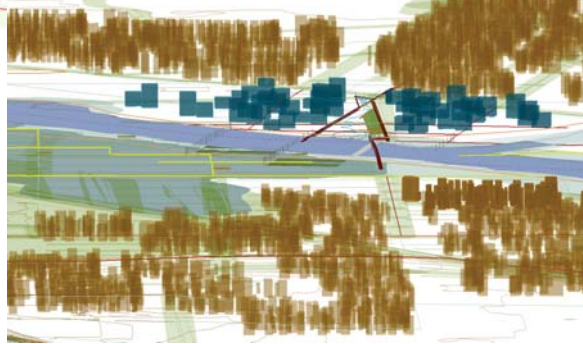
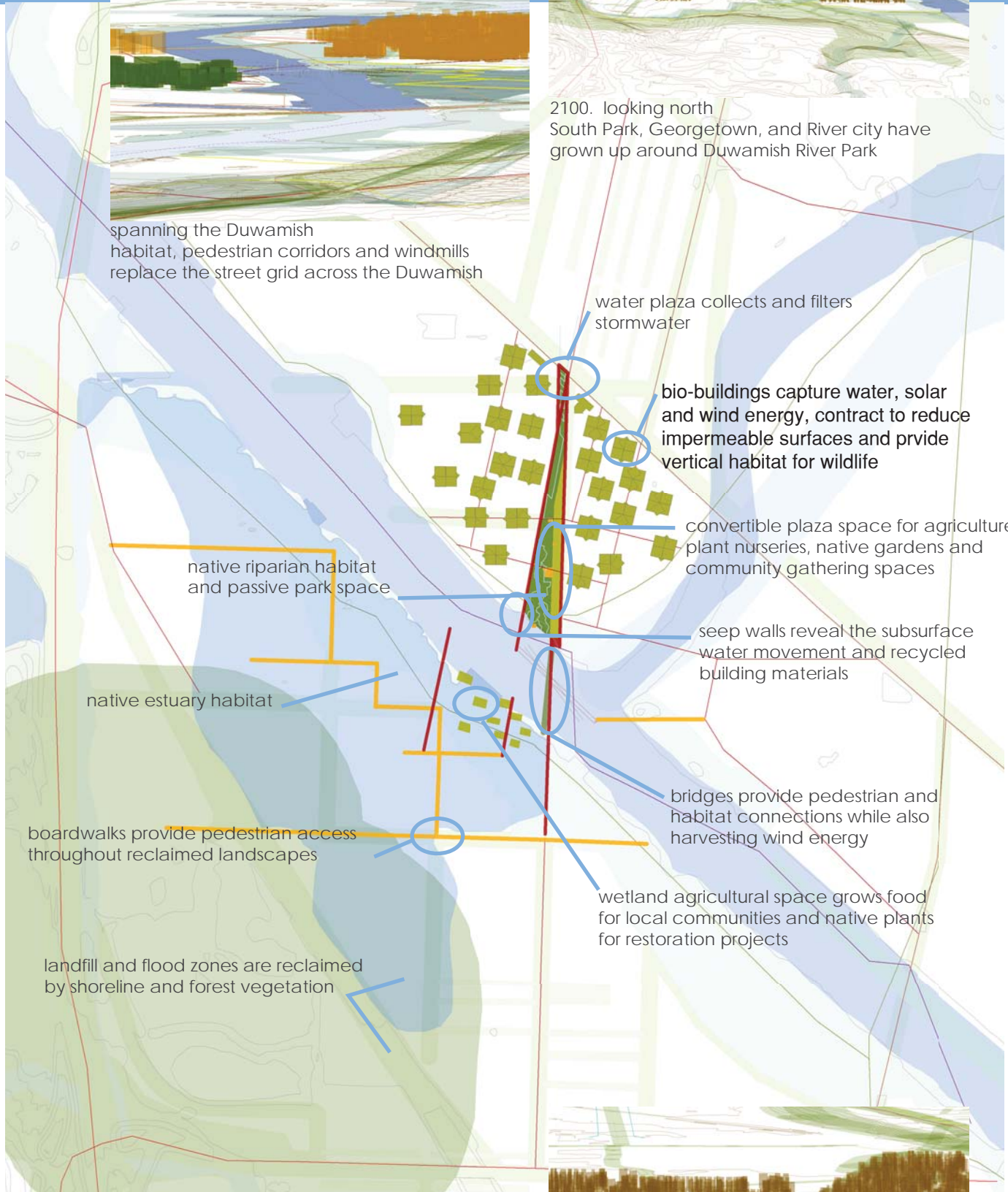
Duwamish



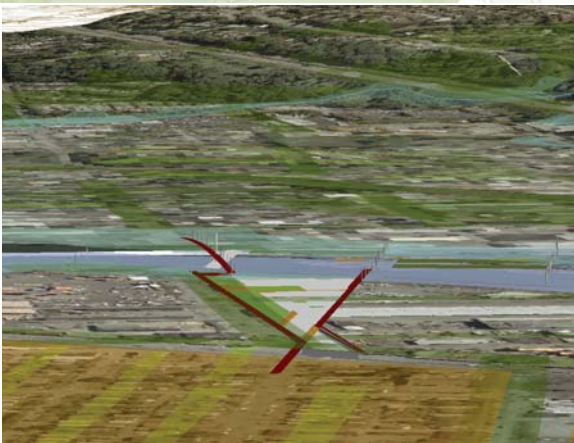
2100. looking north
South Park, Georgetown, and River city have grown up around Duwamish River Park



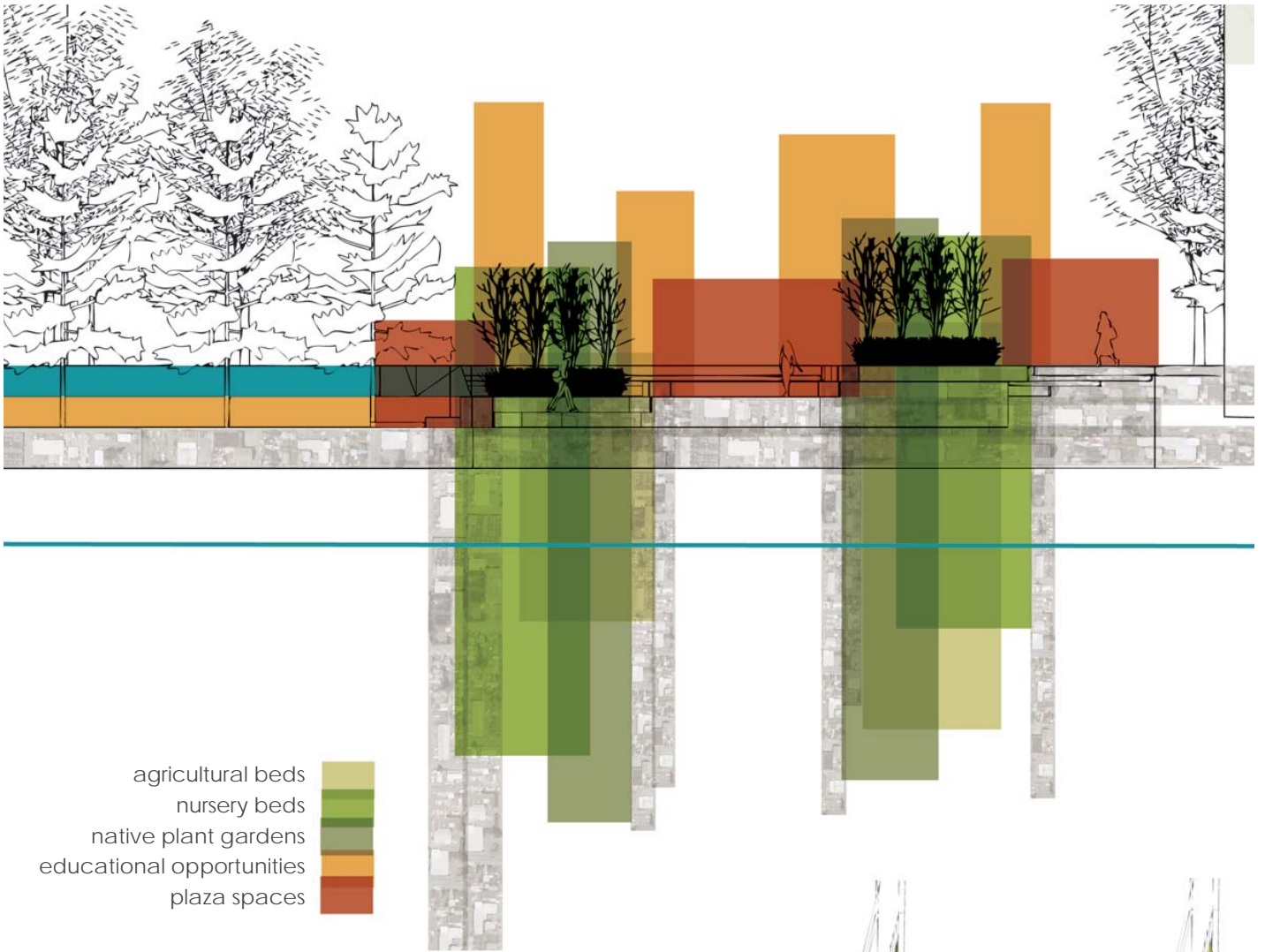
spanning the Duwamish habitat, pedestrian corridors and windmills replace the street grid across the Duwamish



8th avenue corridor
Duwamish River Park bridges the habitat and pedestrian gap between Georgetown and South Park

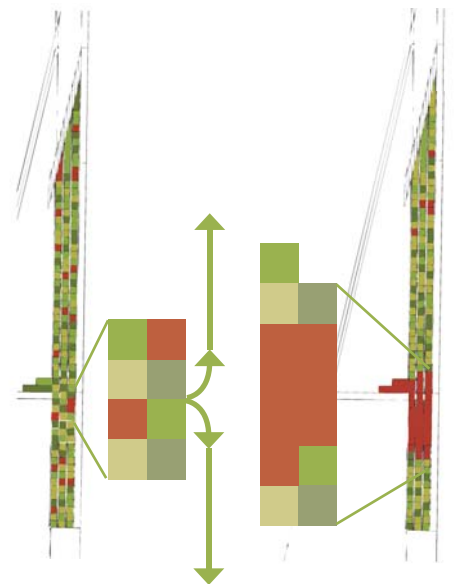


wetlands, forests and agriculture the flood zone, the landfill and the slide zone have been reclaimed for estuary habitat and native plant nurseries



agri-plazas

terraced agricultural and nursery beds shift along tracks to make room for intimate plazas and large community gathering spaces



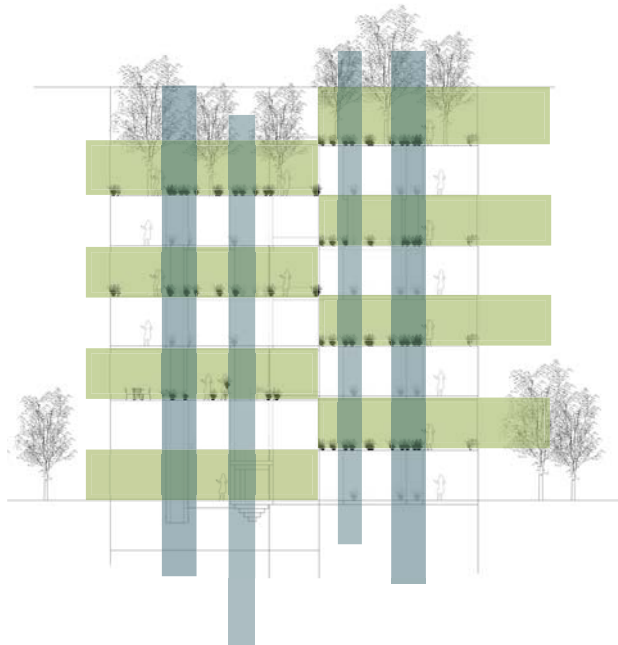
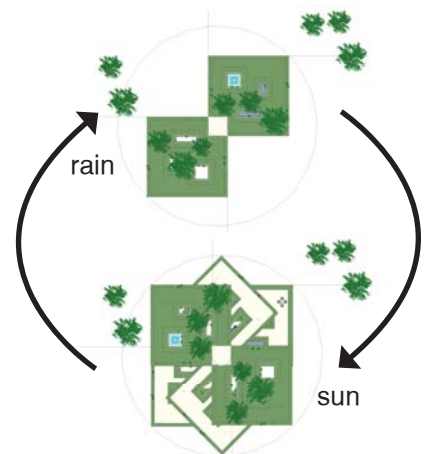
Duwnaish

bio-buildings

buildings and landscapes respond to environmental conditions by changing form and position to maximize energy efficiency and human use



structures unfurl to capture sunlight and collapse to reduce impervious surfaces

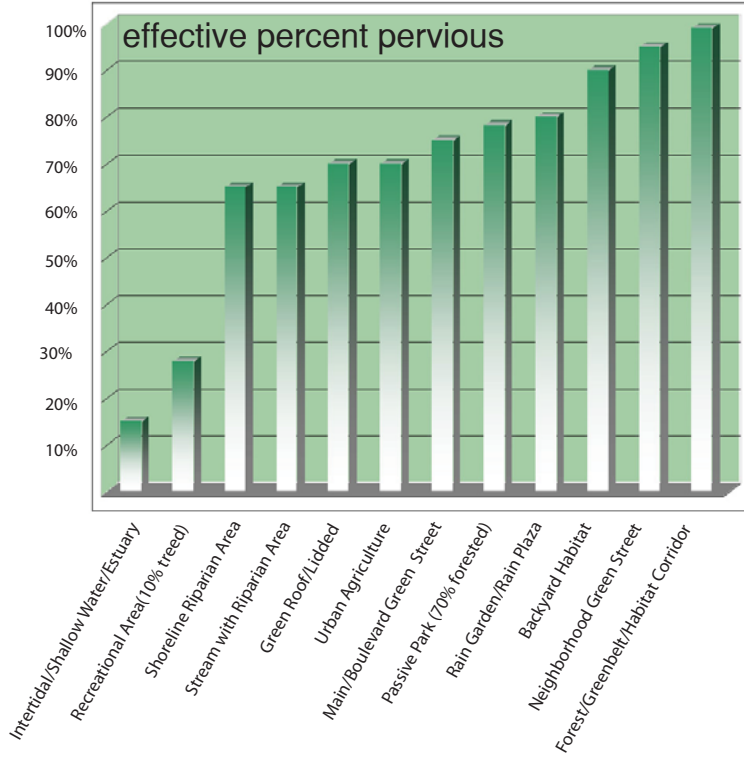


buildings provide the vertical habitat structure that has been lost from the urban landscape

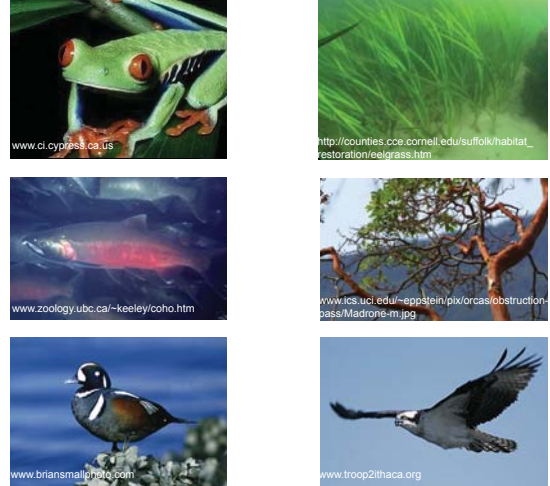
ECOLOGICAL BENEFIT EVALUATION

analysis of hydrological and habitat improvements: ballard and duwamish study areas

hydrology



habitat



Throughout the world, cities fragment, isolate, and degrade natural habitat. Application of the principles of landscape ecology, including interactions among patches, corridors, and metapopulation habitat networks, is valuable for enhancing urban ecological health. By improving habitat quantity, quality, and connectivity, it is possible to conserve and protect native plant and animal species.

Duwamish Study Area Results

study area size: 1,230,036 acres
 area of improvements (20 years): 959 acres
 area of improvements (100 years): 3054 acres

Time Period	Effective Pervious Surface	Storage Capacity (CCF)	Area of Improvements	Habitat Quality
current	1,369 acres effective pervious surface	970,476 CCF	797 acres	limited corridor connectivity low habitat quality limited interior habitat few stepping stones
20 year	2,636 acres effective pervious surface	822,164 CCF	2,855 acres	increased habitat quality expanded stepping stones
100 year	4,799 acres effective pervious surface	205,194 CCF	5,531 acres	improved corridor connectivity enhanced habitat quality increased interior habitat expanded stepping stones

Duwamish