



GREEN RIVER PROJECTS

Achieving Flood Protection, Habitat Restoration,
Economic Sustainability and Preserving Public Spaces



PROJECT LOCATIONS

1. Briscoe/Desimone Levee
2. Boeing Levee
3. Green River Natural Resources Area
4. Lower/Lowest Russell Road Levee
5. SR 516 to S. 231st Way Levee
6. Downey Farmstead Restoration
7. Hawley Road Levee
8. Riverview Channel
9. Leber Homestead Restoration
10. Foster Park Levee
11. Horseshoe Bend Levee



WHAT KENT IS DOING

The City of Kent is committed to protecting residents and businesses from flooding, restoring natural habitat, promoting a healthy, vibrant economy, and preserving public spaces along the Green River. The projects described in this booklet include many of the following features:



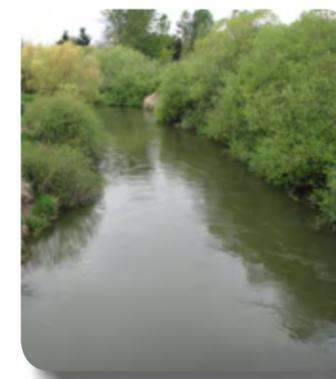
Adding Woody Debris for Wildlife Habitat and Flood Protection

Woody debris consists of anchored tree trunks, roots, rootwads, and logs that increase the complexity of the stream channel. Water flowing through and around wood creates pools and provides habitat for salmon and their prey. The pools created by the woody debris offer deeper water habitat, which can be especially important during low flows in the summer months. Large woody debris also provides a layer of protection for riverbanks during high river flows.



Adding Shelves or Benches for Wildlife Habitat and Flood Protection

Shallow areas on riverbank side slopes are known as benches, shelves, or terraces. They provide habitat for fish, birds, and other wildlife. A healthier plant community also exists along terraced riverbanks as varying water levels in a river are able to support diverse plant species. Benches or shelves parallel to the riverbank also help stabilize the side slopes and provide a wider channel for flood water storage, reducing the risk of flooding.



Planting Native Trees and Removing Invasive Plants for Habitat and Preserving Public Spaces

Along urban riverbanks, native plants are often dominated by invasive and aggressive plants such as Himalayan blackberries, reed canary grass, and Japanese knotweed. These invasive plants provide little to no habitat benefit for fish and wildlife. Native plants and trees help shade the river to reduce river temperatures and also provide leaf litter and insects into the river which are an important part of the food cycle for fish, birds, and other wildlife. Invasive plants also crowd the riverbank and decrease access and visibility into the river, which diminishes recreational opportunities. Replanting our riverbanks provides an opportunity for trail users to better experience a connection with the Green River.



Repairing Levees for Flood Protection

Levees are embankments designed to prevent overflow and flooding from the river. Our short term objective is to repair known deficiencies in our levees to a condition that meets or exceeds Federal Emergency Management Agency (FEMA) accreditation standards. We are in the process of constructing, modifying, and maintaining our levees to reach this goal. With a levee that is designed, constructed and accredited by FEMA, areas that are protected by these levees are mapped outside of the FEMA flood zones.

BRISCOE/DESIMONE LEVEE

Located along the Green River at the north end of Kent, the Briscoe/Desimone levee reduces flood risk for areas of Kent, Tukwila and Renton. There are reaches of this levee segment that are in need of repair and do not meet criteria established by FEMA. This project includes construction of a setback levee floodwall next to the existing trail, landward of the existing levee, which will exceed FEMA standards. The floodwall will reduce flood risk, while also allowing for future planting on the existing riverbank, which will increase fish habitat and provide shade on the river to cool water temperatures. The levee will protect an important warehouse and industrial area and an improved trail will provide recreational opportunities.



The Briscoe/Desimone Levee helps reduce flood risk to parts of Kent, Tukwila and Renton. Approximately 18,400 jobs are located within this area.



Current conditions at the Briscoe/Desimone Levee segment.



Future conditions as seen from the water.



- 1** Briscoe/Desimone Levee
- 2** Boeing Levee
- 3** Green River Natural Resources Area

BOEING LEVEE

The City has entered into a design agreement with the US Army Corps of Engineers for an Ecosystem Restoration Project along the eastern bank of the Green River from S. 200th St. to S. 212th St. Currently under design, the goal is to enhance wildlife and fish habitat for almost one mile of the river while also increasing flood storage. In addition, the city is committed to balancing the recreational opportunities and connection to the Green River with the Corps' restoration project goals. The project will include removing or re-grading the existing riverbank while leaving the existing levee in place. Existing non-native and invasive vegetation will be removed and replaced with native plants and trees, improving habitat along this section of the Green River. In addition to the restoration project, construction of a certified earthen levee and flood wall began was completed in 2013. Both of these projects strike a great balance between restoration, recreation, and flood protection along the Green River.



Construction work on the new secondary levee and flood walls was completed in 2013.



Current conditions at the Boeing Levee segment. Blackberry vines that currently line both sides of the riverbank, provide little to no ecological habitat or flood protection.



Wall face texturing of salmon, heron and native plants was designed to celebrate the ecology of the river.



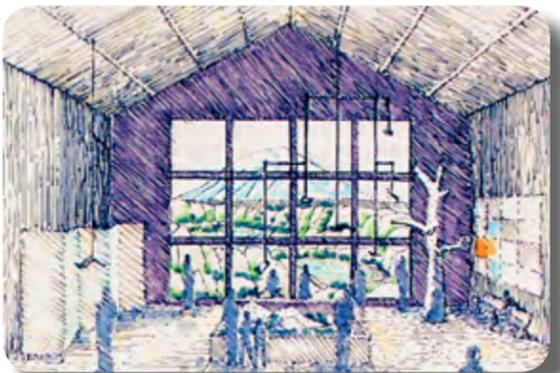
**1. Briscoe/
Desimone Levee**

2 Boeing Levee

**3. Green River
Natural
Resources Area**

GREEN RIVER NATURAL RESOURCES AREA

The Green River Natural Resources Area (GRNRA) is located in the northwest portion of the Kent Valley. The 304 acre site provides flood storage, stormwater treatment, wildlife habitat, passive recreation and environmental education opportunities. The open water and wetlands at the GRNRA were converted from an abandoned sewage lagoon and adjacent uplands in 1996. These water features offer flood storage to significantly reduce flows in lower Mill Creek while simultaneously serving as a nesting, feeding, and brooding area for nearly 200 bird species. Future plans include construction of a new watershed center to educate the public about the function, utility, importance and beauty of the natural resources available along the Green River corridor.



Future GRNRA Watershed Center interior perspective.



Storage and treatment of stormwater.



Nearly 200 species of birds have been identified at the site.



- 2. Boeing Levee
- 3. Green River Natural Resources Area
- 4. Lower/Lowest Russell Road Levee

LOWER/LOWEST RUSSELL ROAD LEVEE

The Lower/Lowest Russell Road Levee, which lies between S. 212th St. and S. 231st Way, spans nearly 1.5 miles. When connected to the adjacent levee segments, this project will reduce flood risk for nearly two-thirds of the Kent Valley. Currently, some reaches of this levee do not meet FEMA standards. This project includes building a secondary levee landward of the existing levee in those reaches. In a future phase of this project, the secondary levee will remain in place and the existing levee will be removed to allow for more habitat improvements and increased flood storage. In addition, the city is looking at future opportunities for a separated road and trail. This reach of levee is adjacent to Van Doren's Park and the Green River Natural Resource Area. This levee reach aims to simultaneously reduce flood risk and beautify public recreational areas nearby.



A goal of the project is to extend healthy native plantings on the right bank. This is in stark contrast to the blackberry vines on the left which dominate the riverbank in this area.



Large woody debris will be installed next to the river banks.



3. Green River Natural Resources Area

4. Lower/Lowest Russell Road Levee

5. SR 516 to S. 231st Way Levee

SR 516 TO S. 231ST WAY LEVEE

The SR 516 to S 231st Way Levee is located on the east side of the Green River. Some of the areas behind this levee include the Lakes Community, the Kent Valley Ice Centre and the Riverbend Golf Course. This project includes construction of secondary levees in areas that require improvements for levee accreditation. With an accredited levee, the area behind the levee is mapped outside of FEMA flood zones. Property located outside the FEMA flood maps are not required to purchase flood insurance or to face project development regulations. The secondary levees will provide flood protection while allowing native vegetation to be planted on the river banks. Future phases of this project include removal of the existing levee to allow for more habitat improvements and increased flood storage. The secondary levee will remain along with the Green River Trail.



The Lakes Community is protected from flood risk behind the SR 516 to S. 231st Way Levee.



Current vegetation and habitat are limited along the SR516 to S. 231st Way Levee.



- 4. Lower/Lowest Russell Road Levee
- 5. SR 516 to S. 231st Way Levee
- 6. Downey Farmstead Restoration



DOWNNEY FARMSTEAD RESTORATION

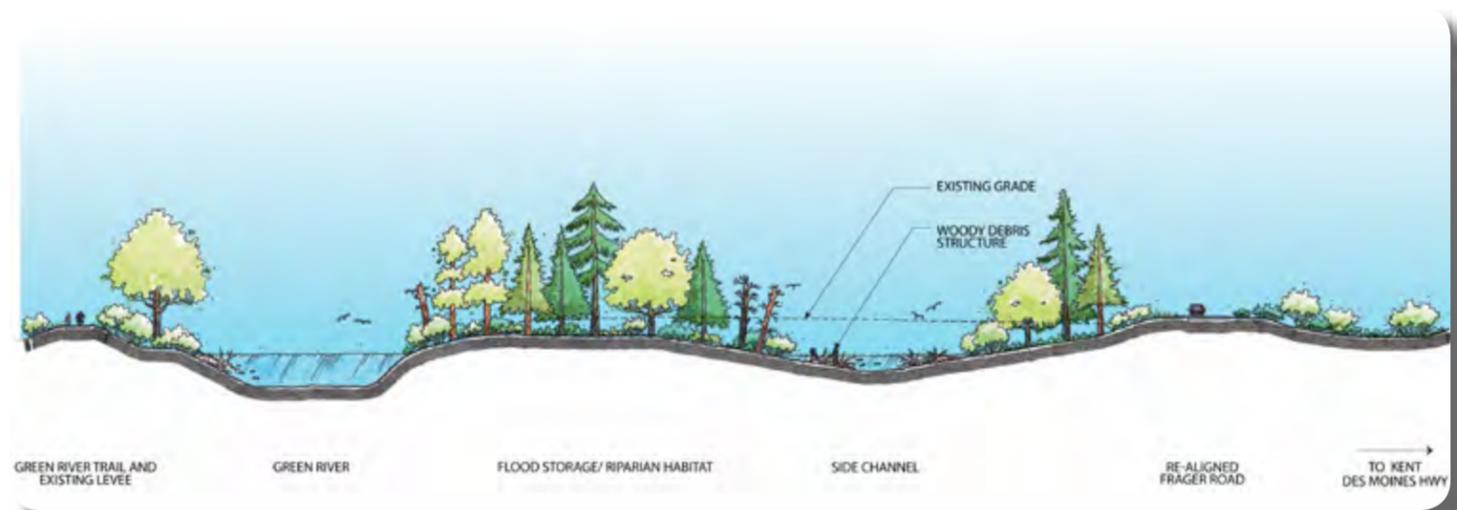
The Downey Farmstead was previously used as a tree nursery and is located between the Green River and SR 516. This 22-acre site will be reshaped into a network of side channels of various depths which will enhance habitat for salmon and increase flood storage in the Green River. All non-native vegetation will be removed and replaced with native plants and trees. Large wood structures will be placed in the newly constructed side channels to add habitat complexity, cover and refuge. The project will allow Chinook and other salmon species to take shelter during high flow events in the river, and will provide rearing habitat during summer months.



- 5. SR 516 to S. 231st Way Levee
- 6. Downey Farmstead Restoration
- 7. Hawley Road Levee



Current conditions at the Downey Farmstead.



Proposed future conditions at the Downey Farmstead.

HAWLEY ROAD LEVEE

The Hawley Road Levee is approximately one-quarter of a mile long and is located on the east bank of the Green River, just west of SR167 and north of Riverview Channel. As part of Kent's 12-mile long levee system, the Hawley Road Levee provides flood protection to countless businesses, homes and infrastructure in the Kent Valley. In the short term, levee repairs in this reach will be completed in 2013. As a future long term project, native trees and plants could be planted along the riverbank and large wood structures could be installed along the edge of the river to provide additional habitat for fish and wildlife. The Green River Trail will also be separated from Hawley Road, providing trail users an alternative to traveling on the roadway.



Current conditions at Hawley Road.



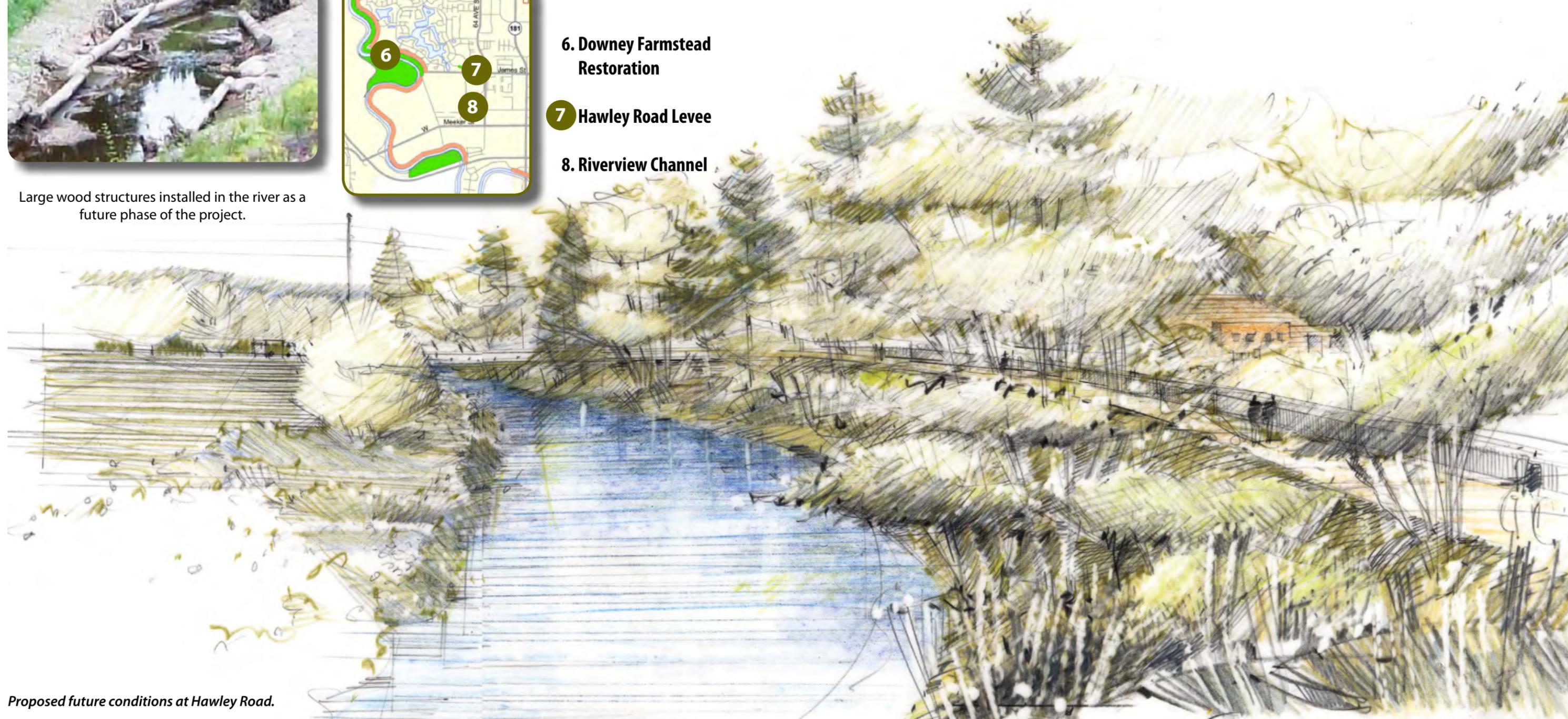
Large wood structures installed in the river as a future phase of the project.



6. Downey Farmstead Restoration

7. Hawley Road Levee

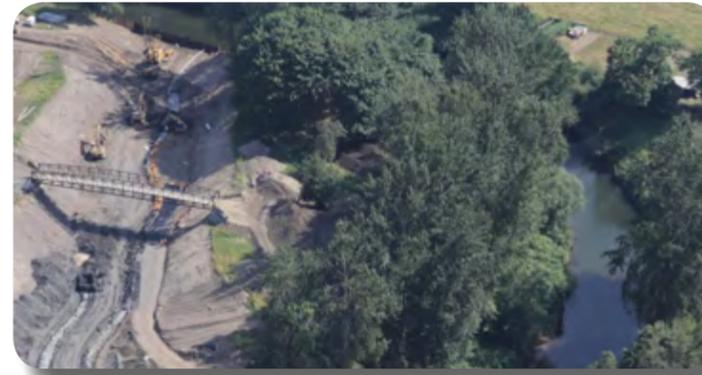
8. Riverview Channel



Proposed future conditions at Hawley Road.

RIVERVIEW CHANNEL

The summer of 2012 saw construction of this "salmon rest stop," a 700 foot side channel that provides refuge for salmon during high flows in the Green River. This ecosystem restoration project was funded in partnership with the City of Kent, U.S. Army Corps of Engineers, the King Conservation District and RCO Salmon Recovery Funding Board. The side channel was constructed on undeveloped park property that the city plans to develop into a passive use park in the future. In addition, a pedestrian bridge was placed over the newly created channel to allow maintenance and preserve public access to the Green River and the entire property. The project included installation of engineered log jams at the inlet and outlet of the channel, large wood structures throughout the length of the channel, as well as native plantings. Besides providing shelter during high flows in the river, the side channel also provides summer rearing habitat for Chinook and other salmon species as well as increased flood storage.



Excavation included removal of about 50,000 cubic yards of material from the 700 foot channel.



New channel connection to the Green River.



New pedestrian bridge over newly created channel.

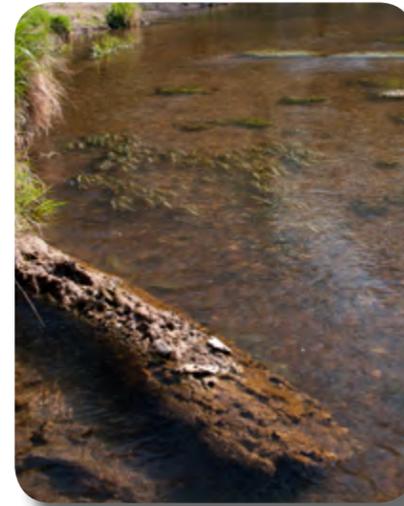


- 7. Hawley Road Levee
- 8. Riverview Channel
- 9. Leber Homestead Restoration



LEBER HOMESTEAD RESTORATION

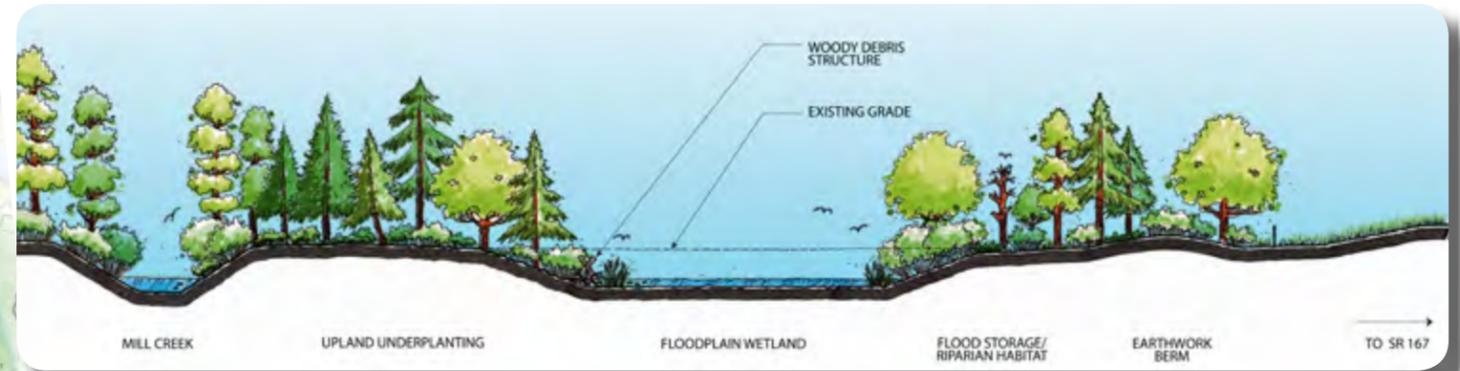
The Leber Homestead Restoration project will include construction of a new back channel on Mill Creek near its confluence with the Green River. The new channel will provide over one-and-a-half acres of flood storage to help reduce flood risk and to provide high-flow refuge for salmon. These high flow refuge areas keep young salmon from being swept down-river too quickly during flood events. The project also includes improved habitat on the east bank of Mill Creek and surrounding the back channel. All non-native, invasive vegetation will be removed and replaced with native near-water and upland plants. Existing mature trees along the banks of Mill Creek and the Green River, that provide shade to cool water temperatures, will be preserved.



Large woody debris will be installed next to the river banks.



Future habitat restoration site. Trees to be preserved.



Proposed cross section showing side channel, native vegetation and other new features.



CURRENT CONDITIONS



- 8. Riverview Channel
- 9. Leber Homestead Restoration
- 10. Foster Park Levee

FOSTER PARK LEVEE

Constructed in 2011, this project included installation of a certified secondary levee in Foster Park, a city park along the Green River. Where real estate allows, secondary levees are advantageous over levees along the riverbank because secondary levees do not impact existing riparian vegetation. As such, secondary Levees are more readily constructed as environmental permitting is simplified. In addition, secondary levees do not preclude future plantings and wood placement along the river. The Foster Park Levee project also included repaving a parking lot with pervious pavement, and construction of a new stretch of the Green River Trail. Future plans include planting trees and other natural vegetation to shade the river and to improve habitat for fish.



New secondary earthen levee and trail at Foster Park setback away from the existing riverbank levee



9. Leber Homestead Restoration

10 Foster Park Levee

11. Horseshoe Bend Levee



CURRENT CONDITIONS

New secondary levee (on Left) and existing riverbank levee at Foster Park.

HORSESHOE BEND LEVEE

Horseshoe Bend is a 2 mile stretch of levee along the southern portion of the Green River in Kent. Construction has been on-going since 2010 to bring substandard portions of this levee up to FEMA standards. By rebuilding sections of the existing levee and constructing secondary levees and floodwalls, the City will be able to remove approximately one-third of the Kent Valley from the floodplain and reduce flood risk to the same area. Nearly 2.5 acres of open space was planted with native shrubs and trees. In a future phase of this project, large wood structures will be installed along the riverbank to provide critical salmon habitat. The Green River Trail along the levee will remain for public use.



Over 1,000 native plants were installed at the Horseshoe Bend Levee.



New native plants will provide a natural buffer between the Green River and the industrial area in the background.



Large wood structures installed in the river as a future phase of the project.



9. Leber Homestead Restoration

10. Foster Park Levee

11 Horseshoe Bend Levee



The City of Kent is dedicated to managing flood protection for its residents, preserving and restoring natural habitat for fish and wildlife, promoting a sustainable and vibrant local economy, and preserving public spaces.

With over 12 miles of river running through the city, protection of the valley through improvements to the Green River levees is of vital importance. Improving the levees to a standard that is accreditable by FEMA offers additional security to local businesses and residents, removes much of the valley from the floodplain, and no longer makes flood insurance a requirement for many properties. While repairing our levees to meet or exceed federal levee standards is the immediate short term goal, Kent's long term goal is to achieve a 500-year flood protection standard and to improve the riverbank plantings for habitat restoration.

The levee and environmental enhancement projects along the Green River are phased to include the restoration of natural habitat with additional native trees and shrubs. These plantings are designed to shade the river while providing fish and wildlife with a more complex ecosystem. In many of the projects, large woody debris will be placed along the riverbank. Kent is also working to improve salmon habitat in the Green River by including: riparian plantings, wood placement along the edge of the river, benched riverbanks, restoration of floodplain functions, and side channel habitat restoration.

As one of the largest warehouse districts on the west coast, the Kent Valley has 90,000 jobs and a \$2.8 billion payroll. A

safe valley with levees that are repaired to a certified condition that meet or exceed FEMA accreditation standards retains these businesses and promotes future job growth in the region.

Along the described levee projects for flood protection of our homes and businesses, and restoration projects for salmon habitat, public spaces such as our city park facilities and the Green River trail weave near and through these project locations. As there is an opportunity to repair our levees and replant our riverbanks with native plant species, there is also an opportunity to preserve our open spaces for the community. The Green River trail corridor has tremendous recreational value that plays a significant role in making Kent a more livable and healthy community. Ensuring that the trail and our city parks offer the opportunity for a safe, accessible, and quality recreation experience will make Kent a place where people choose to live.

The Green River projects outlined in this book exemplify the strong commitment the City of Kent has made to achieving flood protection, habitat restoration, economic sustainability, and public access throughout the entire valley. There are many stakeholders in the Green River Valley working to achieve these goals. The City of Kent is dedicated to working collaboratively and solving regional problems with local solutions.

This booklet was prepared by many and led by city of Kent public works staff. The booklet highlights the flood protection and salmon habitat restoration projects along the river, while balancing the economic needs for businesses and preserving recreational opportunities for the community. The City would like to thank its funding partners on these critical and beneficial projects, including the Washington State Legislature, U.S. Army Corps of Engineers, the King County Flood Control District, the King County Conservation Futures Grant, the King Conservation District, the Water Resource Inventory Area 9 Forum, the Washington Salmon Recovery Funding Board and the Puget Sound Acquisition and Restoration Fund.

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