

Work Plan for Basin Stewardship for the Green River

Prepared in accordance with
Adopted Budget Ordinance 18110, Section 43, Proviso P2

December 1, 2015



King County

**Department of Natural Resources and Parks
Water and Land Resources Division**

Introduction

This report was developed to meet the requirements of Adopted Budget Ordinance 18110, Section 43, Proviso P2 which states:

Of this appropriation, \$500,000 shall not be expended or encumbered until the executive transmits a work plan for basin stewardship for the Green river and a motion that approves the work plan, and the motion is passed by the council. The motion shall reference the subject matter, the proviso's ordinance, ordinance section and proviso number in both the title and body of the motion.

The work plan shall include, but not be limited to:

A. A focus on nonregulatory strategies to reduce water temperatures along the twenty-one mile-long Lower Green river, including public education and engagement, use of tax incentive programs, grant programs and other public tools available to individual land owners, as well as securing private funding where appropriate;

B. A budget for a dedicated, full-time ReGreen the Green Steward, modeled after King County's basin stewardship program. The position shall be administered by King County and shall work closely with the King County Flood Control Zone District, cities along the Lower Green river and the Muckleshoot Tribe, to identify, coordinate and help implement opportunities and programs to establish a continuous, tall tree canopy along the twenty-one-mile-long Lower Green river shoreline, such that there is "Maximum Potential Shade," as defined in the Green River Total Maximum Daily Load report, and to implement the solar radiation maps, known as the Riparian aspect Priorities Map, prepared by the Muckleshoot Indian Tribe; and

C. A plan for the number or portions of FTEs necessary to accomplish the stewardship work contemplated by this proviso and how the position or positions will be funded, through county funds or partially or wholly with local and regional funding partners through interlocal agreements.

The executive must file the report and motion required by this proviso by December 1, 2015, in the form of a paper original and an electronic copy with the clerk of the council, who shall retain the original and provide an electronic copy to all councilmembers, the council chief of staff, the policy staff director and the lead staff for the transportation, economy and environment committee, or its successor.

Proviso Response

The Green/Duwamish River Watershed, including the 21 mile stretch of the Lower Green River subwatershed, is shown in Figure 1. To address the proviso and complete the work plan, the following information is provided:

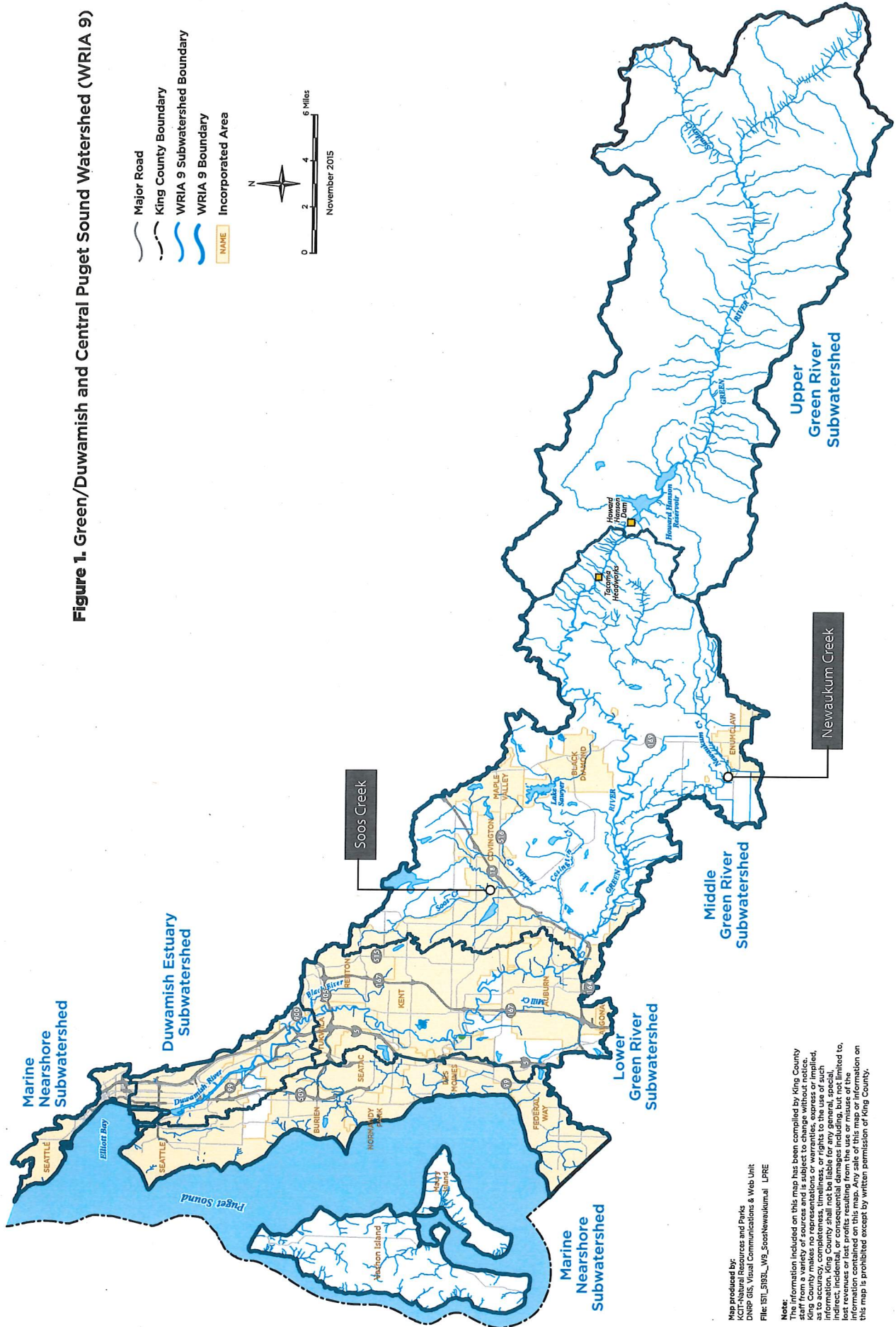
- A. Shade conditions on the Lower Green and their relationship to Green/Duwamish River temperatures
- B. Current non-regulatory strategies
- C. Other non-regulatory strategies for reducing water temperatures
- D. Recommended work plan priorities for Regreening the Green
- E. Recommended budget and funding for the work plan

A. Shade conditions on the Lower Green and relationship to Green/Duwamish River temperatures

The Washington State Department of Ecology (Ecology) published the Green River Temperature Total Maximum Daily Load: Water Quality Improvement Report¹ (TMDL Report) in 2011. Included in that report is Figure 2 which shows the shade deficit in the Green River system, where shade deficit is defined as the difference between a mature riparian shade condition and the riparian condition that currently exists. Several aspects of the report are pertinent to this proviso: 1) shading of the Green River and tributaries below the Howard Hanson dam and upstream of the Lower Green will be an essential component of any non-structural temperature management strategy, and 2) even with full revegetation upstream of the Lower Green, Lower Green and Duwamish salmon will potentially face lethal temperatures in most years. The TMDL Report determined that the most effective way of addressing high water temperatures that are recorded in the Lower Green River is to revegetate the entire Green River and its major tributaries, especially Newaukum and Soos Creeks, which both have high temperatures during late summer and early fall.

¹ <https://fortress.wa.gov/ecy/publications/summarypages/1110046.html>

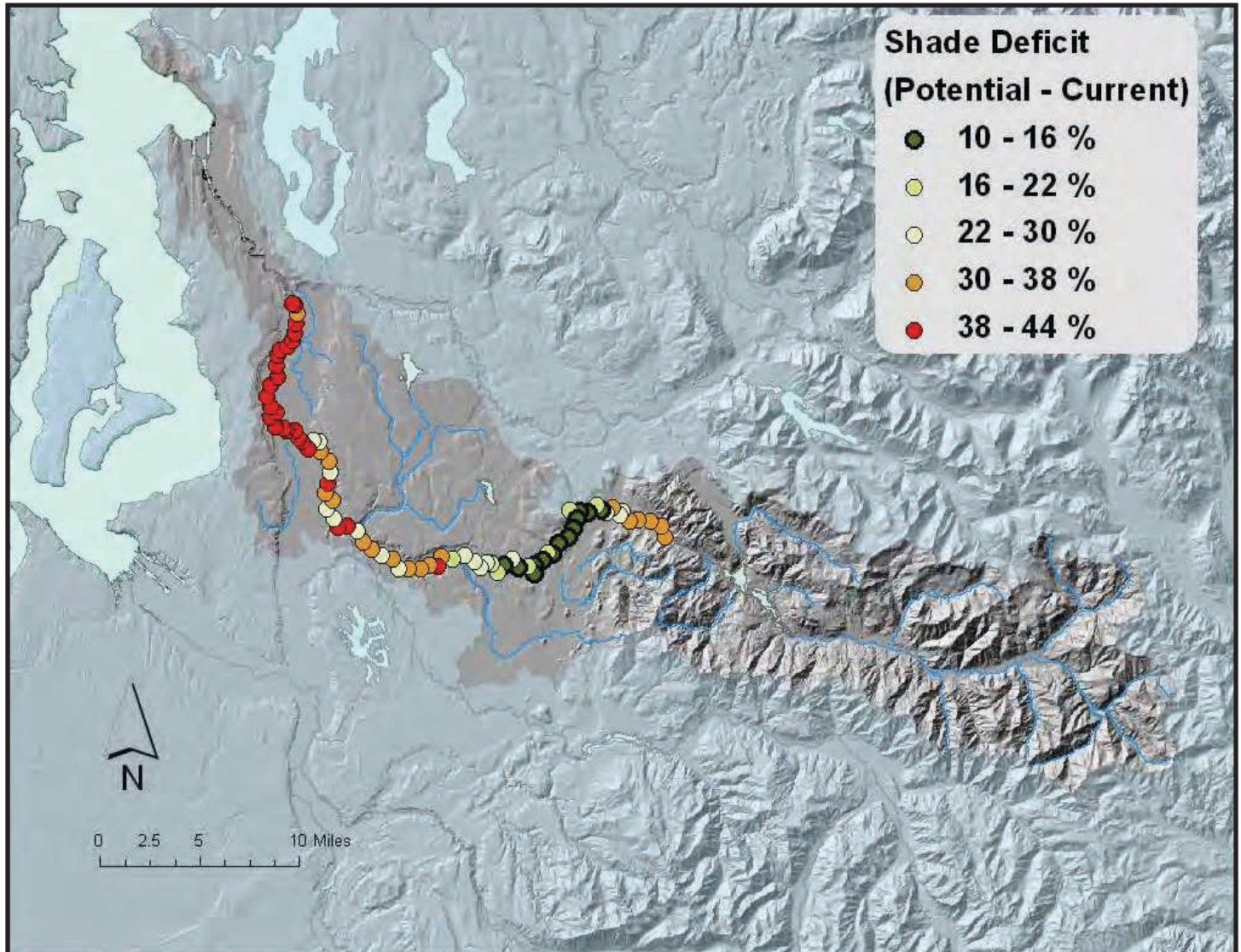
Figure 1. Green/Duwamish and Central Puget Sound Watershed (WRIA 9)



Map produced by:
 King County and Puyallup
 DNR GIS, Visual Communications & Web Unit
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Note:
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Figure 2. Shade Deficit in the Green River System.



B. Current non-regulatory strategies

A number of strategies are currently being evaluated and some are being implemented now or have been implemented for a number of years on the Green River system and are noted below. Appendix 1 includes a table that ranks how effective the strategies may be at reducing water temperatures in the Lower Green.

1. Public Education and Engagement Efforts, and Planting Efforts (Local jurisdiction and Non-Governmental Organization (NGO) efforts)
 - a. EXISTING: Middle Green River, Newaukum Creek and Soos Creek Basin Steward – Replanting work has been underway since 2007 and continues on the Middle Green River and its tributaries like Newaukum and Soos Creeks, which both have high temperatures during late summer and early fall. Since 2007, over 100,000 trees and shrubs have been planted on over three miles of the Newaukum Creek riparian zone on over 20 acres; another 50,000 plants have been planted along Soos Creek and the Middle Green River in this timeframe. The catalyst for these plantings was water quality data collected by Ecology and King County. Funding for these planting efforts has been provided by these two agencies along with the King Conservation District (KCD), Rose Foundation, National Fish and Wildlife Foundation, and the Green River Coalition. Within 10 years, re-planted sites will provide about 90 percent effective shade to the shaded portion of the rivers.
 - b. EXISTING: NGO Stewardship. Many non-profit organizations including EarthCorps, Duwamish Alive!, the Mid-Sound Fisheries Enhancement Group, the Middle Green River Coalition, and the Middle Green River Steward have done stewardship work for years. Water Resource Inventory Area (WRIA) 9 staff has convened these groups to meet monthly, coordinate their activities on the Green River, and develop an interactive map of what projects are taking place where, and by whom.
 - c. NEW in 2015: Strategic Climate Change Action Plan: Among other aggressive actions recommended to reduce climate impacts in King County, is a goal of 1,000,000 trees planted by 2020. Efforts by King County and its partners to replant the Green River will count towards that goal.
 - d. NEW in 2015: Regreening the Green 2016 Conservations Future Tax (CFT) Application – The Water and Land Resources Division (WLRD) of the Department of Natural Resources and Parks (DNRP) applied for a 2016 CFT grant for \$250,000 as seed money to help catalyze a multi-year collaborative acquisition and planting effort on the Lower and Middle Green River. The funding will be used to acquire easements on strategically important properties, between river mile 11 and 32 of the Lower Green River, to allow the planting and protection of tall, primarily deciduous, native shade trees. The focus

will be on properties that, when planted with shade trees, will yield the greatest amount of shade to the river during the most intense periods of sun.

Priority parcels will be identified using shade maps developed as part of the Green River System-Wide Improvement Framework (SWIF) process with analysis by the Muckleshoot Indian Tribe. Initial priorities for acquisition of easements in support of planting shade trees, will be Lower Green River shoreline areas on the map that are identified as “medium, high, and critical” for shade.

For the 2016 CFT and Parks Levy (PL) projects, the major biennial budget supplemental ordinance that includes most FY 2016 Capital Improvement Program (CIP) projects, including CFT /PL, is currently scheduled to be transmitted in mid-December. If approved, King County will need to look for matching funds from other governments and non-profits.

- e. NEW in 2015: Knotweed Control. An important consideration in revegetation efforts, particularly on County-owned easements, is the ongoing monitoring and maintenance required to ensure healthy growth of the riparian plantings and management of invasive plant species. The cities of Auburn and Tukwila have recently been engaged with Forterra and King County’s Noxious Weeds program to develop a comprehensive knotweed removal and revegetation effort, and will partner together to apply for grants to fund this effort. The effort is modeled after Forterra’s and King County’s partnership to successfully eliminate knotweed on the Cedar River.

- f. NEW in 2015: SWIF Phase 2 Clarification of Levees Available for Planting. As noted earlier, progress on the Lower Green is inextricably linked to providing cooling along the largely unvegetated banks of the 21 mile reach between river miles 11 and 32. There are 16 miles of levees in the Lower Green (see levees in Figure 3) that are enrolled within the U.S. Army Corps of Engineers (Corps) PL 84-99. The King County Flood Control District is in the process of developing a vegetation guideline for inclusion in the interim Green River SWIF. The extent of planting has not yet been determined, but the District is working through issues of cost, maintenance, and inspectability among others. Finding ways to create shade adjacent to levees will be essential to reducing Lower Green water temperatures.

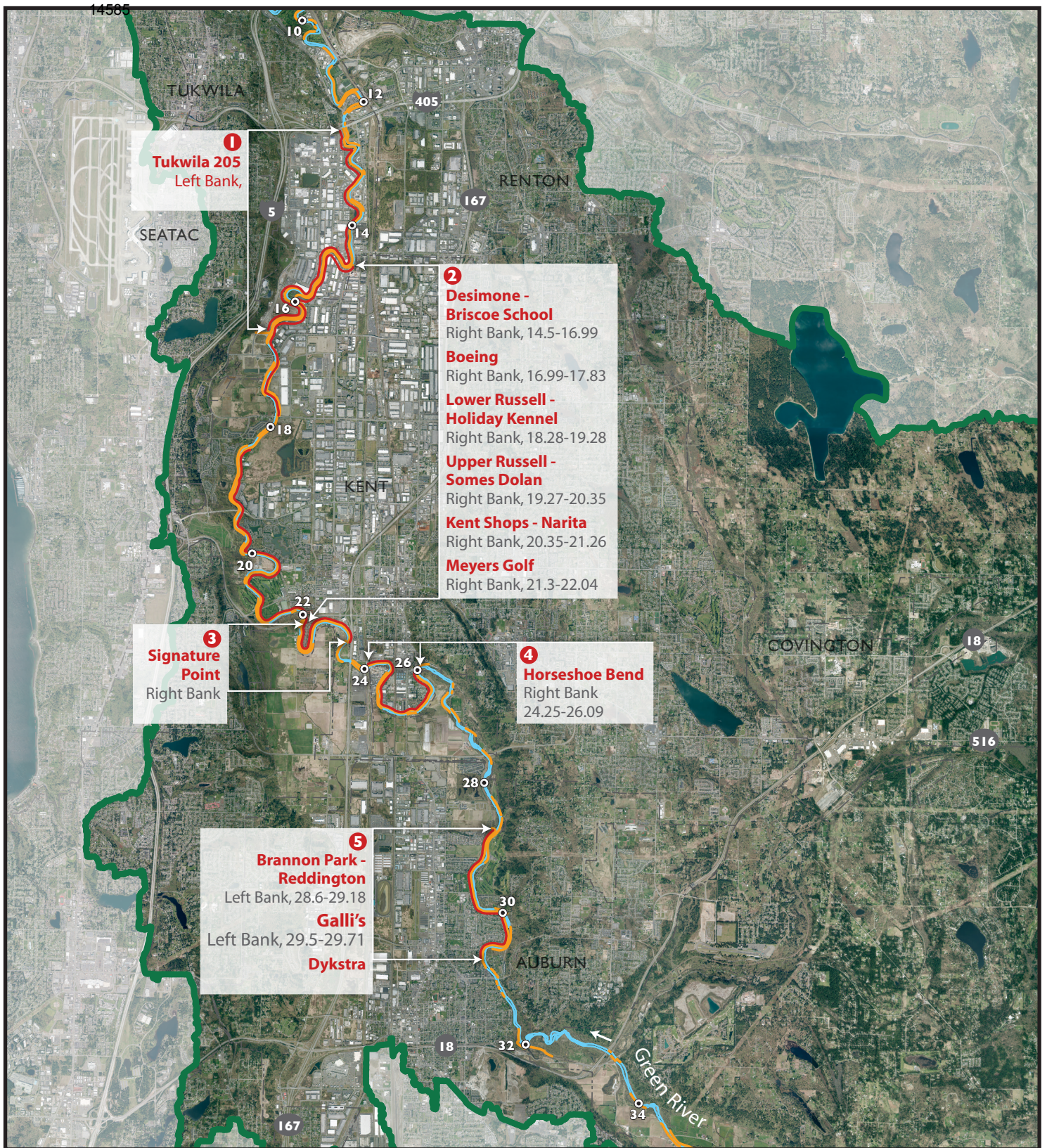




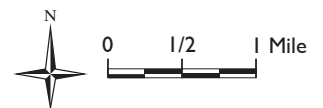


Figure 3. Locations of Levees Along the Lower Green River System.

-  USACE SWIF Letter of Intent Levee Systems
-  Flood Protection Infrastructure (Levees & Revetments)
-  Watershed Boundary
-  Road
-  Incorporated Area Boundary
-  River Miles (Approximate)



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Data sources: King County datasets
 File name: 1401_3508wUSACEgreenLEVEEmap.ai wgab

2. Tax Incentive Programs

- a. EXISTING: Public Benefit Rating System (PBRs). The PBRs [KCC 20.36.100] has several resource categories which benefit landowners who protect or restore surface water buffers on their property. The program currently requires a landowner to enroll additional areas of the property beyond those already protected by covenants or other land use regulation (including stream buffers) for credit/enrollment to be considered.
- b. NEW in 2015: Public Benefit Rating System (PBRs). An ordinance currently being reviewed by the Council would allow areas of property already protected by a land use regulation (such as certain critical area designations or native growth, forest retention or other covenant) to be enrolled in the benefits of PBRs without enrolling additional acreage outside of the regulated area if the owner implements a corresponding stewardship plan that improves upon the open space resources to be enrolled. For example, owners of a fire-prone forested area adjacent to a river could undertake a forest plan to improve management and reduce risk and receive a property tax reduction. This change to the PBRs encourages greater stewardship of these areas of property and offers more program flexibility to enroll areas of property already under some sort of land use regulation.

3. Grant Programs

- a. NEW in 2015: The Green the Green Grant program - WRIA 9 initiated the Green the Green Grant Program in 2015 with \$250,000 from the Flood Control District's Cooperative Watershed Management fund to run a grant process for on-the-ground riparian improvement projects, with an emphasis on planting trees and community involvement. WRIA 9 hopes that this will be ongoing. For 2015, the focus areas are the main stem Green and Duwamish Rivers, and Soos and Newaukum Creeks and their tributaries. Priority is being given to projects that are within riparian aspect areas throughout the main stem river as indicated by a sun map created by King County using the Muckleshoot Indian Tribe methods that were used for the original Lower Green Sun Map².

4. Planning and Prioritization

- a. NEW in 2015: Green-Duwamish Watershed Strategy - The *Our Green/Duwamish project* is a collaborative effort to develop a Green/Duwamish Watershed Strategy. The goal of the project is to engage the watershed community in developing a vision and strategy that will shape the future protection of the watershed's air, land and water. The strategy

² <http://www.govlink.org/watersheds/9/funding/pdf/green-river-sun-map-index.pdf>

will geographically link existing programs and projects with desired outcomes for cleaner air and water, improved public health and equity and enhanced economy. The project is being delivered in three phases – the first phase: stakeholder input and gathering information about existing plans and programs has just concluded and DNRP is beginning the second phase during which it will develop targets, strategies and actions for specific topic areas that were prioritized during the first phase of the project. Two potential focus areas that could support Regreening the Green are: 1) potential creation of a watershed-wide open space plan and 2) developing the structure for a watershed-wide approach to stormwater management. Creating and optimizing land area for tree plantings as recommended in Regreening the Green, and the resulting riparian buffers, could be relevant in both of these topic areas. The third and final phase will complete the Watershed Strategy and is anticipated by the end of 2016.

- b. NEW in 2015: WRIA 9 – Salmon Recovery Plan Update – The process for completing the 10-year plan update is soon to be before the WRIA 9 Watershed Ecosystem Forum for consideration. The WRIA 9 plan is an opportunity to link salmon recovery projects with the strategy for Regreening the Green.
- c. NEW in 2015: Revegetation Strategy Development – A six-member working group convened by WRIA 9 in September 2015 is on course to develop a strategy for revegetating streams, river banks and shorelines by April 2016. The strategy will be used to attract additional funding, coordinate efforts, and evaluate proposals for funding, with the goal of comprehensively revegetating the entire Green River over the next 10-20 years. The partners involved directly in the working group are WRIA 9, the Water and Land Resources Division, the Muckleshoot Indian Tribe, the City of Kent, Forterra, and the City of Tacoma. Products (such as the revegetation strategy) will be reviewed by the WRIA 9 Implementation Technical Committee, which has wider involvement by additional WRIA 9 cities, Ecology, the Washington Department of Fish and Wildlife, and non-profits. The outcome will be:
- a set of overall goals,
 - geographic and reach-level priorities to achieve those goals, and
 - implementation approaches. Overall goals include reducing stream temperatures by planting tall trees in the most important areas, and providing needed salmonid habitat by planting trees and other native plants along riparian areas. Maps will be developed to display these goals and priorities.

C. Other non-regulatory strategies for reducing water temperatures

The primary non-regulatory strategies for reducing water temperatures are listed in the TMDL Report and include providing more shade and improving riparian areas, protecting cool

groundwater and enhancing current summer base flows, drawing deeper, cooler water from behind the Howard Hanson dam, acquiring and retiring water rights in the watershed, and monitoring for effectiveness.

In addition to the multiple efforts presently underway in the Green/Duwamish River watershed, the following would improve temperatures throughout the system:

1. Public Education and Engagement: Establish a ReGreen the Green Campaign
 - a. Establish a ReGreen the Green Campaign – This will engage residents, businesses, and property owners to take their own actions to help establish shade around local rivers and streams. The Campaign would help people find a variety of resources and information and link existing organizations and jurisdiction to individual and businesses who want to help. Expanding on the collaboration effort being convened by WRIA 9 could help target resources and accelerate regreening efforts. The work could include development of a toolbox for temperature reduction in agricultural areas that benefits both farmers and riparian areas, as spelled out in the WRIA 9 Salmon Recovery Plan;³ and could involve working directly with farmers to develop ideas, working with KCD, using first projects as demonstration sites, promoting existing incentives programs, and existing stewardship programs, and identifying and removing culverts on agricultural lands that are fish barriers.

The Miller/Walker (M/W) basin steward program is provided here as an example of how a public campaign focused steward could serve in the Green/Duwamish system. The M/W basin steward coordinates a basin program among the City of Burien, the City of Normandy Park, the City of SeaTac, the Port of Seattle and King County through an interlocal agreement (ILA) with the Water and Land Resources Division. The program is administered by WRIA 9 to ensure consistency with the watershed/WRIA salmon recovery effort, including communication among the local governments. Past and current funding amounts to support a 0.4 FTE basin steward position. The steward staffs an interjurisdictional basin committee, writes and administers grants, organizes multiple volunteer noxious weed control projects, tree planting, habitat restoration, and monitoring programs and events. The steward:

- Coordinates communication and outreach among all the ILA partners including through a web page and blog
- Prepares multiple outreach materials that are distributed through all the existing means of communication of the partners
- Trains volunteers and gives multiple presentations/workshops to elected officials, city councils and council committees, community groups, schools

³ Salmon Habitat Plan, Making Our Watershed Fit for a King, WRIA 9, 2005

- Provides individual technical assistance to streamside landowners about riparian vegetation management
- Partners with the King County Noxious Weed Control program
- Works with the King Conservation District on outreach to landowners to get them involved in the Landowner Incentive Program
- Serves as a central point of contact for outreach, education, and information dissemination

2. Planning and Analysis

- a. Conduct a Study of Howard Hanson Dam Operation for Water Quality—Temperature Management. There may be potential for the dam to provide cooler water. For example, the United States Bureau of Reclamation is currently conducting a study in Oregon to address similar issues related to dam operations on the Klamath River.

D. Recommended work plan priorities for Regreening the Green

Reducing temperatures along the Green River is likely to take 20-30 years given the time it takes for trees to grow successfully to a height to effectively shade portions of the river system. There are many efforts underway that could help accelerate efforts to shade or otherwise cool the Green River.

Because of the many water quality related activities and programs underway on the Lower Green and Duwamish, aligning the existing and new programs with a Public ReGreen the Green Campaign should be the top priority for a Basin Steward position.

While planting trees anywhere in the system will help sustain or cool water temperatures, the Lower Green presents particular challenges for accelerating plantings because it has the most exposed shoreline of the Green River. Along the Lower Green, accelerating replanting efforts on private land as well as inspiring energetic investment and replanting on privately held lands is essential to making substantive progress on cooling the Green.

A full time basin steward in the Water and Land Resources Division could accomplish the following:

1. Convene all interested parties at work on tree planting near the Green River to prioritize and align work efforts including federal, state, and local governments, tribes, WRIA 9, environmental groups, civic groups, etc.
2. Develop a public outreach campaign that connects with a broad portion of the community to inspire community action by public and private land owners and includes:
 - a. Technical assistance (kinds of trees to plant, where to plant them, perhaps a skilled crew or people who could train others)

- b. A riparian zone “tool box” brochure and website made available to private landowners so that investments in regreening can be sustained for the long run through forest management or other stewardship plans⁴
- c. Identifying opportunities for “volunteer hours” to be applied for community service, capstone projects, etc.

3. Seek out new and leverage existing funding sources to ensure the CFT match is found.

E. Recommended budget and funding for the work plan

A fully burdened basin steward position would cost \$166,314.55⁵ per year in 2015 dollars. To fund the position, the Water and Land Resources Division would pursue funding as part of the 2017-18 Biennial Budget:

1. Request King County Flood Control District financing (usable throughout the watershed) – 25 percent
2. For the Unincorporated portion of the Green River, use the Surface Water Management (SWM) Fund to pay for 50 percent of the position
3. Pursue a WRIA 9 Memorandum of Understanding agreement to increase partner funding to help support a steward position (usable throughout the watershed) – 25 percent

⁴ If the Council passes proposed Ordinance 2015-0433, the Public Benefit Rating System will have more flexibility to provide tax credits for property owners implementing stewardship plans.

⁵ Base salary (\$103,698.50) + Benefits (\$35,608.81) + Training and Supplies (\$2075.00) + SWM Administration Cost Distribution (\$24,932.24) = \$166,314.55

Appendix 1. Summary of Existing, New and Potential Actions

Existing and current actions to reduce water temperatures and plant trees in the Lower Green and throughout the Green River system		
Program Title	Status	Anticipated Effectiveness for Lower Green Temperatures (High, Medium, Low)
B1a Middle Green River, Newaukum Creek and Soos Creek Stewardship	Existing	H
B1b Non-governmental (NGO) Stewardship	Existing	M
B1c Strategic Climate Change Action Plan	New in 2015	M
B1d Regreening the Green 2016 CFT Application	New in 2015	H
B1e Knotweed Control	New in 2015	H
B1f SWIF Phase 2 -- Clarification of Levees Unavailable for Planting	New in 2015	TBD
2a Public Benefit Rating System	Existing	L
2b Public Benefit Rating System - New	New in 2015	M
3a Green the Green Grant Program	New in 2015	TBD
4a Green-Duwamish Watershed Strategy	New in 2015	L
4b WRIA 9 – Salmons Recovery Plan Update	New in 2015	H
4c Revegetation Strategy Development	New in 2015	H
Potential Non-Regulatory Strategies for Reducing Water Temperatures		
Program Title	Status	Anticipated Effectiveness for Lower Green Temperatures (High, Medium, Low)
C1a Establish a ReGreen the Green Campaign	Potential	H
C2b Conduct a study of Howard Hanson dam operation for water quality-temperature management	Potential	M