Large Wood in King County Projects

Nancy Faegenburg, Meeting Facilitator

Mercer Island Community and Event Center
June 7, 2017

Department of Natural Resources and Parks
Water and Land Resources Division
River and Floodplain Management Section
Rural and Regional Services Section
Meeting Overview

• Background and Context
• Cedar River Natural Wood Update
• River Safety in the Schools
• Project Presentations
• Open House

Green River
Use of Large Wood in Rivers and Streams

Flow deflection and redirection

Belmondo Revetment Repair
Use of Large Wood in Rivers and Streams

Habitat enhancement and mitigation

Belmondo Revetment Repair
Natural Deposition in Rivers and Streams

Tolt River 2011
Key Features of Procedures

- King County Ordinance, Public Rule and DNRP Procedures for Placed Wood (2010)
  - Consider public safety in project design
  - Seek public input during design
    - Annual meetings
    - 30% design
    - 60% design

- Applies to all KC projects that place wood or where natural wood is likely to deposit

Website: www.kingcounty.gov\rivers
Complementary Elements

• Outreach
  – Annual safety awareness campaign
  – River Safety Programs in the Schools

• Manage project sites
  – Repairs and modifications
  – Independent review

• Respond to concerns about natural wood
  – Modify wood, signage, and close unsafe sections
  – Website describing projects, known hazards, and river safety tips
Project Locations

- Sammamish River Bank Repairs
- Buncy Bank Restoration Griffin Creek
- SE 19th Way Road Protection Revetment Repair
- Cedar Rapids ELJ Maintenance Repair
- Issaquah Creek MRP
- Taylor Creek Mitigation
- Middle Boise Creek–Van Weirengen
- Riverbend Levee Setback and Floodplain Reconnect
- Lower Russell Road Levee Setback
- Teufel LWD Mitigation

[Map showing the locations]
Questions?

Nancy Faegenburg, Program and Project Manager
206 477-4688
nancy.faegenburg@kingcounty.gov
www.kingcounty.gov/rivers

***For project-specific information, please contact the Project Manager or Contact listed on today’s agenda
2017 Known Naturally Occurring Wood Hazards
RM 7.4 – Cedar Rapids Downstream Log Jam
RM 7.6 – Cedar Rapids Upstream Double Spanner
RM 11.7 – Lion’s Camp Downstream
RM 11.7 – Lion’s Camp Upstream
RM 12.6 – Byer’s Bend
Questions?

Kate Akyuz, Environmental Scientist
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kate.akyuz@kingcounty.gov
www.kingcounty.gov/rivers
Welcome to the River Safety Road Show

Reaching 1,800 students in schools near King County rivers
Learn to swim
Look and listen
Ask a grown up
Wear a life jacket
What do you think Marta’s favorite fashion accessory is?
Stay safe this summer. Wear a lifejacket. Thank you.

www.martatheriverotter.org

Presented by

Marie Trigona
Online Public Engagement Specialist
DNRP, King County
marie.trigona@kingcounty.gov
SE 19th Way Road Protection Revetment Repair Project

Mary Lear, Project Manager

June 7, 2017

Department of Natural Resources and Parks
Water and Land Resources Division
River and Floodplain Management Section
Project Location
Project Objectives

• Repair damages and improve stability of revetment
• Reduce impacts of overtopping of SE 19th Way
• Design project for long term solution
• Provide aquatic and riparian habitat benefits
• Preserve agricultural practices on the properties adjacent to the revetment
• 30% design complete – Summer 2017
• 90% design complete – Fall 2017
• Revetment repair construction – Summer 2018
Project Description

• Repair 200 feet of revetment
  – Rock to be placed along the toe of the revetment
  – Top portion of the revetment to be vegetated with native plants
  – No large wood incorporated in revetment repair
  – Relocate large wood on site
Large Wood at Project Site
Large Wood At Project Site
Large Wood At Project Site
Large Wood Proposal

- Remove large wood at start of repair
- Replace large wood at completion of repair
Questions?

Mary Lear, Project Manager
206-477-4749
mary.lear@kingcounty.gov
www.kingcounty.gov/rivers
Cedar River / WRIA 8 Projects
Sammamish River Bank Repairs Project

Dan Heckendorf, Project Manager

June 7, 2017

Department of Natural Resources and Parks
Water and Land Resources Division
River and Floodplain Management Section
Vicinity Map

Project Location
(RM 4.7 - 4.9)
Site Map
Existing Site Conditions

West Site

East Site
Project Purpose

Stabilize the levee bank in the locations of identified failure

Goals & Objectives

• Reduce risks to trail users
• Maintain the Federal (USACE) Flood Control Facility (levee) in accordance with the existing Operations and Maintenance Agreement
NOTES:
2. SURVEY DOES NOT REPRESEN A BOUNDARY SURVEY OF PROPERTY OR ROADRIGHT-OF-WAY. THIS SURVEY DELINEATES PROPERTY LINES AND POINTS OF APPRAISAL ELAPSED FROM PLANS.
3. ISSUE OF SURVEY:
   THE OWNER(S) OF PROPERTY BETWEEN HOOKER'S POINT AND HOOKER'S POINT SHOWN ON THIS SURVEY.
4. BEGINNING:
   THE WEST END OF ROADRIGHT-OF-WAY TO Be DETERMINED BY TRANSPORTATION SURVEY WORKER.
5. CENTERLINE OF ROADRIGHT-OF-WAY TO BE DETERMINED BY TRANSPORTATION SURVEY WORKER.
6. PROPERTY LINES SHOWN ARE SOURCED FROM KING COUNTY ASSESSOR'S SITE DATABASE AND ARE INTENDED TO ONLY BE A BOUNDARY SURVEY.
7. POINTS ShOWN ON DRAWING(shown as elevation of designated ordinary high water (OHW))
8. CONSUMED FOR PRINTING ON WPAH DCP ROYAL HORD/settingsdialog 2000 DESIGN.
Intended Function of Large Wood

- Toe protection
- Roughen bank
- Flow deflection
Recreational Use
## Project Schedule

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Wood Checklist posted at 30% design and request for comments</td>
<td>May 2017</td>
</tr>
<tr>
<td>Large Wood Checklist posted at 60% design and request for comments</td>
<td>July 2017</td>
</tr>
<tr>
<td>Complete design</td>
<td>Fall 2017</td>
</tr>
<tr>
<td>Construction</td>
<td>Summer 2018</td>
</tr>
</tbody>
</table>
Questions?

Dan Heckendorf, Project Manager
Rivers and Floodplain Management Section
206-477-8459
dan.heckendorf@KingCounty.gov
www.kingcounty.gov/rivers
Riverbend Levee Setback and Floodplain Restoration

Sarah McCarthy, Senior Ecologist

June 7, 2017

Department of Natural Resources and Parks
Water and Land Resources Division
Rural and Regional Services Section
Recreational Use

2013 Data

~3,700 Cedar River floaters
~1,900 in Ricardi Reach
78% Inner tubes
15% Rafts
5% Kayaks
~13% Wearing Life vests
Project Goals

• Improve quality, quantity and sustainability of salmonid spawning and rearing habitat

• Reduce flood and erosion risks to people, property and infrastructure

• Accommodate public use consistent with future ecological conditions on site

• Balance flood and ecological benefits and other objectives with project costs
Preliminary Design Features
Large Wood Proposed

• Preliminary estimates 450-600 logs
  ➢ All located in the floodplain
  ➢ Majority placed in jams/clusters
  ➢ Anchoring not yet designed, but majority stabilized with rock and soil ballast
  ➢ A few may require piles for greater stability

• In newly created channels to:
  ➢ Stabilize inlets and restrict/meter flow
  ➢ Restrict channel expansion and headcutting
  ➢ Increase complexity, roughness and provide cover and stability

• In floodplain to increase roughness, dissipate energy and trap wood and sediment
Schedule

- June 2015 – Project Initiation
- 2015 -2016 – Data Collection and Analysis
- Spring 2017 – Preliminary Design
  - Large Wood Checklist ~ June 23, 2017
- Winter 2017 – 60% Plans and Specifications
- Winter 2018 – Final Plans Complete
- Summer 2019 – Construction Target
Contact Information

Jon Hansen, Project Manager
jon.hansen@kingcounty.gov
206-477-4706

Project webpage:
http://www.kingcounty.gov/habitat
restoration-projects.aspx
Cedar Rapids ELJ Maintenance Repair Project

Jay Smith, Project Manager

June 7, 2017

Department of Natural Resources and Parks
Water and Land Resources Division
Ecological and Engineering Services Unit
Project Purpose

Maintenance Repair of Engineered Log Jam (ELJ) 6 at Cedar Rapids Site

Goals & Objectives

• Reduce risks to pedestrians on floodplain
• Reduce risks to recreational boaters
• Restore ELJ to originally designed condition

While also:
• Maintaining current levels of erosion protection
2010 Site Conditions
2012 Site Conditions
Existing Site Conditions

Q = 400 cfs

Photo Taken Looking Upstream
Existing Site Conditions

Q = 1500 cfs
Types of Floating Vessels on the Cedar River

Source: 2010 Cedar River Recreation Study (Biedenweg and Akyuz, 2011)
Cedar River Recreational Use

Cedar River Levee and Revetment Setback Projects in a Recreation Context

Proposed Maintenance Repair

- King County Flood Protection and Natural Lands
- Other Protected Areas
- Recreation Use

2010 Floaters
- 2 - 50
- 50-100
- 100-250
- 250-500
- >500

Source: 2010 Cedar River Recreation Study (Biedenweg and Akyuz, 2011)
Proposed Actions

- Bumper Logs
- Backfill with Riprap, Alluvium, and Topsoil
- Willow Plantings in Backfill
# Project Schedule (2017)

<table>
<thead>
<tr>
<th>Month Range</th>
<th>Task</th>
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<tbody>
<tr>
<td>February – April</td>
<td>Site Assessment and Alternatives Evaluation</td>
</tr>
<tr>
<td>May – June</td>
<td>Design</td>
</tr>
<tr>
<td>June – August</td>
<td>Permit</td>
</tr>
<tr>
<td>August</td>
<td>Construction</td>
</tr>
</tbody>
</table>
Questions?

Jay Smith, Project Manager
(206) 477-4356
jay.smith@kingcounty.gov
www.kingcounty.gov/rivers

Teufel Nursery-Large Wood Mitigation

Fatin Kara, Green River Supervising Engineer
Jennifer Rice, Green River Coordinator

June 7, 2017

Department of Natural Resources and Parks
Water and Land Resources Division
River and Floodplain Management Section
Project Location: Green River-Left Bank-River Mile 20.35
Project Purpose: mitigation for past tree cutting on Green River levees

• Place 85 logs in the Green River to provide juvenile salmon rearing habitat

• Plant 1,043 tree along the north perimeter of the property to provide shade to the Green River
Project Goals and Objectives

- Fulfill habitat impact mitigation requirements for past tree cutting along Green River Levees in 2009.
- Minimize exposure to recreational users of the river channel.
- Maintain or improve flood protection in the surrounding community.
- Provide shade for the Green River.
Existing Site Conditions

View of large wood project site from across the river
River Recreation Safety Considerations

- Located on inside bend in river reach without much river recreational use.

- Line of sight from 350 feet upstream. Visual approach time is about 4 minutes during low summer flows.

- The structure will be almost entirely out of the water during low summer flows.

- Project includes a log deflector at upstream end for higher flows.

- Riverward extent of structure limited to maximum of 10 ft. beyond current bank line.
Site Overview

Tree planting area. Approximately 100 ft. buffer

Large Wood Project Area
Large Wood Design Section View
### Project Status and Input Opportunities

<table>
<thead>
<tr>
<th>Event</th>
<th>Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preliminary design presented at 2016 Large Wood Meeting</td>
<td>June 8, 2016</td>
</tr>
<tr>
<td>Large Wood Checklist posted at 30% design and request for comments</td>
<td>October-November 2016</td>
</tr>
<tr>
<td>Present 90% design at 2017 Large Wood Meeting</td>
<td>June 7, 2017</td>
</tr>
<tr>
<td>Public/Neighborhood meeting</td>
<td>Spring 2018</td>
</tr>
<tr>
<td>Construction</td>
<td>August-October 2018</td>
</tr>
</tbody>
</table>
Project Website

- To learn more about this project and sign up for project updates visit:

  Teufel Mitigation, Flood Risk Reduction, and Salmon Habitat Restoration Project

Questions?

Jennifer Rice, Green River Coordinator,
Rivers and Floodplain Management Section
206-477-4813
jennifer.rice@kingcounty.gov
www.kingcounty.gov/rivers
Lower Russell Road Levee Setback Project

Briefing for Large Wood Meeting

June 7, 2017

Department of Natural Resources and Parks
Water and Land Resources Division
River and Floodplain Management Section
Lower Russell Rd Levee Setback Project

Location: City of Kent – Right Bank Green River between River Mile 17.85 (S. 212th St) and RM 19.25 (S. 228th St)

Need: Existing system of levees and revetments do not meet current engineering standards - risk for flooding.
Project Goal: Construct a flood protection system that balances policy directives regarding flood protection (e.g., flow containment, scour protection, stability, and vegetation maintenance), habitat restoration, and recreational use.

Project Elements:
- Increases flood conveyance and containment within project reach
- 5,000 linear feet of setback levee
- 2,800 linear feet of floodwall
- Relocation of Van Doren’s Park and removal of Russell Rd north of park.
- Scour protection: Flow deflectors/barbs composed of rock upstream of 212th St Bridge (similar to Reddington Levee barbs along Brannan Park in Auburn)
- Large Wood: Log Bumper Toe, Wood Rafts, Log Jams and misc. wood

Project Cost: $52 Million total cost (Design estimate assuming 2019 construction)
## Lower Green River Recreational Users

Table 7. 2013 Remote Camera Results - Green River.

<table>
<thead>
<tr>
<th></th>
<th>Whitney Bridge RM 41.3 and 41.1 LB</th>
<th>Auburn-Black Diamond RM 33.4 LB to Isaac Evans Park RM 29.1 RB</th>
<th>Russell Woods Park RM 19.4 LB to Briscoe Park RM 15.9 RB</th>
<th>Totals for Green River System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Remote Cameras</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>Number of Days of Camera Operation</td>
<td>106</td>
<td>376</td>
<td>313</td>
<td>795</td>
</tr>
<tr>
<td>Total Groups Recorded</td>
<td>701</td>
<td>860</td>
<td>81</td>
<td>1,642</td>
</tr>
<tr>
<td>Average Groups Recorded per Day</td>
<td>6.6</td>
<td>2.3</td>
<td>0.3</td>
<td>2.1</td>
</tr>
<tr>
<td>Total People Recorded</td>
<td>2,312</td>
<td>2,626</td>
<td>167</td>
<td>5,105</td>
</tr>
<tr>
<td>Adults (16+)</td>
<td>2,126 (92.0%)</td>
<td>2,220 (84.5%)</td>
<td>157 (94.0%)</td>
<td>4,505 (86.2%)</td>
</tr>
<tr>
<td>Youth (12 to 17)</td>
<td>106 (4.6%)</td>
<td>260 (9.9%)</td>
<td>7 (4.2%)</td>
<td>373 (7.3%)</td>
</tr>
<tr>
<td>Children (1 to 11)</td>
<td>76 (3.4%)</td>
<td>146 (5.6%)</td>
<td>3 (1.8%)</td>
<td>227 (4.4%)</td>
</tr>
<tr>
<td>Male</td>
<td>1,441 (62.3%)</td>
<td>1,726 (65.7%)</td>
<td>129 (77.2%)</td>
<td>3,296 (64.6%)</td>
</tr>
<tr>
<td>Female</td>
<td>871 (37.7%)</td>
<td>900 (34.3%)</td>
<td>36 (22.8%)</td>
<td>1,809 (35.4%)</td>
</tr>
<tr>
<td>Average People Recorded per Day</td>
<td>21.8</td>
<td>7.0</td>
<td>0.5</td>
<td>6.4</td>
</tr>
<tr>
<td>People Wearing Life Vests</td>
<td>254 (11.0%)</td>
<td>322 (12.3%)</td>
<td>118 (70.7%)</td>
<td>694 (13.6%)</td>
</tr>
<tr>
<td>Total Vessels Counted</td>
<td>2,016</td>
<td>2,103</td>
<td>131</td>
<td>4,250</td>
</tr>
<tr>
<td>Rafts</td>
<td>281 (13.9%)</td>
<td>526 (25.0%)</td>
<td>12 (9.2%)</td>
<td>819 (19.3%)</td>
</tr>
<tr>
<td>Canoes</td>
<td>29 (1.4%)</td>
<td>49 (2.3%)</td>
<td>14 (10.7%)</td>
<td>92 (2.2%)</td>
</tr>
<tr>
<td>Kayaks</td>
<td>58 (2.9%)</td>
<td>103 (4.9%)</td>
<td>84 (64.1%)</td>
<td>245 (5.8%)</td>
</tr>
<tr>
<td>Inner tubes</td>
<td>1,556 (77.2%)</td>
<td>1,204 (57.3%)</td>
<td>8 (6.1%)</td>
<td>2,768 (65.1%)</td>
</tr>
<tr>
<td>Other</td>
<td>92 (4.6%)</td>
<td>221 (10.5%)</td>
<td>13 (9.9%)</td>
<td>326 (7.7%)</td>
</tr>
<tr>
<td>Vessels with Paddles</td>
<td>283 (14.0%)</td>
<td>566 (26.9%)</td>
<td>112 (85.5%)</td>
<td>961 (22.6%)</td>
</tr>
</tbody>
</table>
Lower Russell Rd Large Wood Design

- Install roughly 280 large logs in various configurations (~130 logs in or along channel margin)
- Install 5 pile supported ELJs (Lattice Jams and Apex Jam)
Flood Protection, Habitat Restoration and Recreation Enhancements
Log “Bumper” Toe Along Riverbank
Floating Log Raft

- 4 each are planned
- Located in backwater area off main channel
- Designed to float and remain tethered with chain and boulders
Bank Roughening Wood

- Intended primary placement is back from or above Summer flows (above 500 cfs)
Apex Wood Jam

- 1 planned
- Located on riverbank at backwater channel entrance
- Scour along bank downstream and adjacent to structure is anticipated
Lattice Wood Jam

- 3 each are planned
- Located between and in front of tips of barb deflectors
- Channel migration expected to fully engage wood jams and barb tips at summer flows
- Flow expected to split around jams at flows ~ 500 cfs.
Timber Crib

- One is planned
- Located at northern end of project reach
- Use to support transition between constructed revetment and existing bank slope
Lower Russell Rd Levee - Timeline

- Project initiated: Jan. 2014
  - Selected alternative – August 2015
  - 30% design – January 2016
- Instream Project Design Checklist and solicited public comments – July, 2016
- 60% Design Completion: Nov. 2017
- Permitting: 2018
- Planned Construction: 2019-2020
Questions?

Additional Project Information:
• Search for project web page within www.kingcounty.gov
• Project Manager: Erik Peters
  (206) 477-4797
  Erik.Peters@KingCounty.gov
Small Projects on Non-Recreational Rivers and Streams
Taylor Creek
Floodplain Restoration Project

Project Manager: Dan Eastman

King County
Existing Site Conditions
2015 Orthophoto

No Boaters in Taylor Creek

Current MRP Project Property Boundary

2005-2006 Restoration/Mitigation Project

Legend
- Parcels
- Existing Stream Easement - 2001
- Proposed_2017_Vallejos_Easmt - 2.8 acres
- Gas_Pipeline_Easement
- Existing_Stream_OHWM
- Existing Wetland

FLOW

FLOW

0 50 100 200 300 400 Feet
Proposed Site Conditions

Large wetland, mostly isolated from stream

Possibly some minor wood placement along streambanks
Schedule

• 30% Design: November, 2017
• 60% Design: June, 2018
• Final Design: January, 2019
• Construction: Summer, 2019
Questions?

Project Manager: Dan Eastman
Dan.Eastman@kingcounty.gov
206-477-4684
Issaquah Creek Wetland Mitigation Project

Project Manager: Josh Latterell
Objectives

Proposed Construction 2019

• >44.8 wetland mitigation credits

• Water quality

• Flood & erosion protection

• Habitat functions
Proposed large woody debris placement along right bank

Proposed large woody debris placement in floodplain and constructed backwater channels
Schedule:
30% Design—Nov., 2017
60% Design—June, 2018
Permits—December, 2018
Construction—Summer, 2019
Questions:

Josh Latterell
Project Manager, Senior Ecologist
206-477-4748
josh.latterell@kingcounty.gov
Middle Boise Creek Stream Restoration
Van Wieringen

Sarah McCarthy, Project Manager
King County Department of Natural Resources and Parks
No Boaters in Boise Creek
No Boaters in Boise Creek

12ft wide farm road with cattle fence

Excavate widened channel with shallow slopes

Add ~80 pieces of large wood to new channel

Add stream gravel to low flow channel

Retain significant trees on islands

Plant native trees and shrubs

3.5 acre conservation easement

Middle Boise Creek - Van Wieringen Preliminary Design Concept
# Schedule

<table>
<thead>
<tr>
<th>Activity</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>30% Design complete</td>
<td>June 2017</td>
</tr>
<tr>
<td>60% Design complete</td>
<td>Fall 2017</td>
</tr>
<tr>
<td>Permit applications submitted</td>
<td>Fall 2017</td>
</tr>
<tr>
<td>Construction</td>
<td>Summer 2018</td>
</tr>
<tr>
<td>Planting</td>
<td>Fall 2018-Winter 2019</td>
</tr>
</tbody>
</table>

**Contact Information**

Sarah McCarthy, Project Manager  
[sarah.mccarthy@kingcounty.gov](mailto:sarah.mccarthy@kingcounty.gov)  
206-477-4766
OPEN HOUSE!

Feel free to find the Project Manager or representative of any projects you are interested in and ask questions.