Large Wood in King County Projects

Mercer Island Community and Event Center

June 9, 2015

Nancy Faegenburg, Meeting Facilitator

Water and Land Resources Division

King County
Meeting Overview

- Project presentations
- Q & A
- Open house
Use of Large Wood in Rivers and Streams

Flow Deflection and Redirection

Belmondo 2013

Cedar Rapids 2013
Use of Large Wood in Rivers and Streams

Habitat Enhancement and Mitigation
Use of Large Wood in Rivers and Streams

Natural Deposition

Tolt River 2011

Rainbow Bend 2015

Tolt River 2011
Key Features of Procedures

- King County Ordinance and DNRP Procedures for Placed Wood (2010)
  - Consider public safety in project design
  - Seek input through annual meetings and at 30% design
- Project review by professional engineer and ecologist
- Applies to all KC projects that place wood or where natural wood is likely to deposit

Website: www.kingcounty.gov/rivers
Programmatic Elements

- **Ongoing commitments:**
  - Annual safety awareness campaign
  - Study recreational use and impacts

- **Independent 3rd party review of projects:**
  - How well does it meet goals and objectives
  - Design vs. as-built
  - How was input used and what are the results

- Convene stakeholder group to review policies and procedures
Questions?

**General Information:**
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**Project-Specific Information:**
Contact Project Manager or Contact listed on agenda
PROJECTS ON SMALL CREEKS USING LARGE WOOD

HARRIS CREEK FISH PASSAGE PROJECT
CLOUGH CREEK OFF-CHANNEL SEDIMENT POND
SCOTT PROPERTY, JUDD CREEK HABITAT ENHANCEMENT PROJECT
KLAPP PROPERTY RESTORATION
HARRIS CREEK FISH PASSAGE PROJECT
PROJECT GOAL:

Restore fish passage to about 4 miles of stream with excellent habitat characteristics.

Assessment in the Snoqualmie watershed completed in June 2011 by Wild Fish Conservancy ranked Harris Creek as 2nd highest priority.
OBJECTIVES

- Remove the existing, non-functional fish ladder at the downstream end of the NE Stossel Creek Way culvert at NE 138th Place;

- Construct a 95-foot long roughened channel consisting of a well graded bed mixture and logs.
PURPOSE OF WOOD

17 pieces of large wood will be used to provide channel roughness and complexity to the tapering reach of channel.

Wood and boulders are necessary to break up flows and slow water velocities to improve fish passage.
• Project on private property and King County right-of-way.
• No known recreational use;
• Property owners are very supportive.
PROJECT STATUS

• Final design;
• Summer, 2015 construction
• Posted for public review and comment in May, 2015

Project Manager/Contact:
Carolyn Butchart
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CLOUGH CREEK OFF-CHANNEL SEDIMENT POND
PROJECT PURPOSE, GOALS AND OBJECTIVES

**Purpose:** Sediment accumulations in the channel have cause flooding of homes and roadways.

**Goal:** To reduce the amount of excessive sediment in the stream to reduce overbank flood events which have damaged homes, yards, buildings, roads, and utility infrastructure.

**Objective:** Construct an off-channel pond to collect sediment.
PURPOSE OF WOOD

Several logs without rootwads will be installed at the inlet to the off-channel pond to divert flow and sediment into the pond.

More wood, with rootwads, will be installed in the reach of Clough Creek adjacent to the new pond to improve habitat and provide bank stability.
RECREATIONAL REVIEW

No known recreational use;
Summer flows between 1 - 2 cubic feet per second.
PROJECT STATUS

Preliminary design;
Project plans and instream design checklist will be posted for review and comment soon;
Summer, 2016 construction.

Project Manager/Contact:
   Wendy Kara
   206-477-4723
   Wendy.kara@kingcounty.gov
SCOTT PROPERTY, JUDD CREEK HABITAT ENHANCEMENT PROJECT
PROJECT PURPOSE AND GOAL

The purpose of the project is to restore natural habitat in Judd Creek and the Judd Creek Estuary.

Goal:

To conserve and restore natural processes by placing woody debris that was naturally and historically more common on Puget Sound shores and streams.
PROJECT OBJECTIVE:

Restore natural habitat forming processes by placing 30 logs with root balls in 550 feet of Judd Creek and 30 logs with root balls along 400 feet of shoreline in the Judd Creek Estuary.
TYPICAL WOOD PLACEMENTS IN THE STREAM REACH

- Logs keyed into existing trees

- Log complex with key logs embedded into bank

- Embed logs 50% of length, min 18" cover
TYPICAL WOOD PLACEMENTS IN THE ESTUARY REACH

LOG COMPLEX ANCHORED AROUND EXISTING TREE WITH ADDITIONAL BED LOG CHAINED TO KEYED LOGS

LOG RAFT WITH EARTH ANCHORS
RECREATIONAL REVIEW- STREAM

Judd Creek is a wadable creek that averages 15’ wide and has summer stream flows of < 10 CFS.

Property is owned and managed by the Vashon Maury Island Land Trust, but privately leased. Access is currently limited.
Tide lands are privately owned by the Vashon Maury Island Land Trust and other private property owners.

At low tide, the shallow Judd creek low flow channel averages 20’ wide and 18” deep.

At high tide the estuary is accessible from Quartermaster Harbor by small boats with minimal draft. An existing log blocks the deeper water access to the estuary.

Kayaks and small boats with trawling motors are known to explore the estuary.

The proposed wood placement will not block existing low flow channel and will not exclude recreational use of the estuary.
Project Status

Final Design;
Construction scheduled Summer, 2015

Project Manager/Contact:
Paul Adler, Project Manager
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PROJECT GOALS AND OBJECTIVES

Goal: To enhance the ecological values of the Klapp property and the confluence of Mackey and Bear Creeks, including off-channel habitats.

Objectives:

Remove bank armor and debris from Mackey Creek;

Improve instream habitat by replacing missing structure in the form of large woody debris;

Provide off-channel rearing habitat for juvenile salmonids by enlarging the channel of Mackey Creek at the confluence and connecting the adjacent pond to Mackey Creek;

Establish riparian plant communities throughout the property;
Existing Conditions
Klapp Property Restoration Scope
PURPOSE OF WOOD

To push the channel of Mackey Creek into the newly-connected wetland pond;

To provide cover and hydraulic complexity to the otherwise simple channel;

To provide shade to open areas of the channel
RECREATIONAL USE

- Both Mackey Creek and Bear Creek are too small for recreational floating;

- Some passive recreation (fish viewing).
PROJECT STATUS

- Final Design;
- Summer, 2015 Construction;
- Posted for public comment in April, 2015

Project Manager/Contact:
Laird O’Rollins
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Winkelman Revetment Reconstruction Project

Large Wood Public Meeting
June 9, 2015

Chase Barton, PE, LG, Project Manager
River and Floodplain Management Section
King County Water and Land Resources Division
Project Site Location

[Map of Duvall with marked location of Winkeiman Revetment Reconstruction Project Site Location]
Project Goals

• Reconstruct the revetment to protect the City of Seattle’s Tolt River Water Supply Pipeline.
• Minimize long-term maintenance needs and costs of flood hazard management associated with repeated repairs and the likelihood of emergency actions.
• Provide riparian and aquatic habitat benefits to the extent practicable and required for mitigation.
Project Site Conditions

Looking Upstream from floodplain surface
Looking downstream from toe of bank during low flow conditions
Proposed Design – Bank & Scour Protection

Revetment Elements:

- **Large Wood:**
  - ~840 Logs

- **Toe:**
  - Fill scour hole with riprap and wood

- **Lower Bank:**
  - Pile supported bank roughening jam
  - Bank resloping

- **Upper Bank:**
  - Live stakes
  - Coir encapsulated soil lifts
  - Bank resloping
Proposed Design – Bank Protection

Revetment Elements:
- Large Wood:
  - ~840 Logs
- Toe:
  - Riprap and wood
- Lower Bank:
  - Pile supported bank roughening jam
  - Bank resloping
- Upper Bank:
  - Live stakes
  - Coir encapsulated soil lifts
  - Bank resloping
Proposed Design – Floodplain Alcove Reconnection

Alcove Elements:
- Large Wood:
  - ~210 Logs
- Stream Channel:
  - Culvert replacement
  - Channel resloping
- Access Road:
  - Reconfigured access road across new culvert
  - Invasive plant removal
Recreational Use

- Access to project reach is limited.
  - Upstream access from Carnation
  - Downstream access from Duvall
- Slow velocities in project reach.
- Long sight lines to wood placement locations.
- Infrequent to moderate use by fisherman and motorized boats
  - MacIlroy, June 2009
  - Herrera, October 2014
Recreational Use
Recreational Use
Recreational Use
Recreational Use
Project Schedule

- **April 2015** - Alternatives Analysis [COMPLETED]
- **July/August 2015** - 30% plans available
- **August/September 2015** - Permit applications to be submitted
- **January 2016** - 100% design complete
- **July 2016** – October 2016 - Construction
Questions?

• Contact Information:
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  email: chase.barton@kingcounty.gov
  phone: (206) 477-4854
Elliott Bridge Reach Off-Channel Habitat and Floodplain Reconnection Project

Elliott Bridge Reach

END: Knotweed Control

Elliott Levee Setback and Floodplain Reconnection

Cedar Rapids Levee Setback Repair

Belmondo Revetment Enhancement Project

Rainbow Bend Levee Removal & Floodplain Reconnection

VC File: 1210_2923L_CedarClprojsMapPPT.ai lpre
Objectives

• Satisfy Mitigation Reserve Program Obligations
  ➢ Wetland
  ➢ Off-channel habitat
  ➢ Mainstem Scour structure

• Maintain Flood hazard protection
• Address Recreational safety issues
• Compatibility with future plans
Backwater Channel to provide off-channel rearing habitat for Chinook, coho, sockeye, and steelhead.

Excavation to establish wetland.

Rip-rap removal.
Purpose of Wood

Wood is designed to:

- Create a scour pool with natural cover in the Cedar
- Provide cover and complexity along inside bend
- Limit sediment deposition at mouth of outlet channel
- Provide cover and structure within backwater and wetland
- Provide variety of flow velocity, induce scour, and create eddies of slow water

**AND is required part of Mitigation obligations**
Wood Structure Locations

Elliot Bridge Reach Off-Channel Habitat and Floodplain Reconnection Project
ELLIOIT BRIDGE REACH OFF-CHANNEL HABITAT AND FLOODPLAIN RECONNECTION
ELLIOITT REACH SCOUR STRUCTURE
Left Bank inlet constricted and stable
RECREATIONAL REVIEW

• 2010 & 2013 Recreational Studies
  • Heavy recreational use
  • Tube & Raft use HIGH

➢ On-site meetings with River Safety Council and Resource Agencies

➢ Iterative Design Process
  ➢ Open dialog
  ➢ Incorporating ideas
  ➢ Minimizing conflicts
PROJECT STATUS

• Construction Summer 2015
  ➢ Scour Structure as 2nd Phase in 2016

• Posted for public review and comment in Jan & May, 2015

Project Manager/Contact:
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Project webpage:
www.kingcounty.gov/rivers
Green River
2015 Log Placement Projects
Green River Log Placement Projects
Mitigate for 2009 Levee Clearing
Four Green River Sites
Designated for Tree Cutting Mitigation

- Foster Golf Course (2015)
  22 Logs
- Teufel Nursery (2016)
  89 Logs
- Fenster Park (2015)
  27 Logs
- Green R. Natural Area (2015)
  79 Logs

Total Mitigation (2015-2016) 217 Logs
2015 Mitigation Logs 128
Lower Green River
Recreational Use at Fenster Park
Lower Green River
Recreational Users at Fenster Park
Fenster Park 2014
King County Sheriff’s Findings

“Removal is a good idea.”
Fenster Park 2014
Log Removal Action
Fenster Park 2014
Log Removal Action
Fenster Park 2014
Log Removal Action
Fenster Park 2014
Log Removal Action
Fenster Park
2015 River Condition
Fenster Park Log Placement (2015)  27 Logs

27 pieces of wood to be added altogether. All wood sizes and locations are approximate; final locations to be decided by the project ecologist or engineer during construction.

Fenster Park Log Placement (2015)  27 Logs

27 pieces of wood to be added altogether. All wood sizes and locations are approximate; final locations to be decided by the project ecologist or engineer during construction.

Green River Natural Area Location
King County, Right Bank, RM 38.0
Recreational Use at Green River Natural Area
Recreational Use at Green River Natural Area
Recreational Use at Green River Natural Area
Recreational Use at Green River Natural Area
Green River Natural Area
Log Placement Project (2015) 79 Logs
2002 River Channel Alignment
Green River Natural Area
Log Placement Project (2015) 79 Logs
2007 River Channel Alignment
Green River Natural Area
Log Placement Project (2015) 79 Logs
2009 River Channel Alignment
Green River Natural Area
Log Placement Project (2015) 79 Logs
2012 River Channel Alignment
Green River Natural Area
Log Placement Project (2015) 79 Logs
2013 River Channel Alignment
Green River Natural Area
Log Placement Project (2015) 79 Logs
2013 River Channel Alignment
Green River Natural Area
2015 Log Placement Project
Green River Natural Area
2015 Log Placement Project
OPEN HOUSE

• Small Projects: Laird O’Rollins
• Winkleman Revetment Reconstruction Project: Chase Barton
• Elliott Bridge Reach Off-Channel Habitat and Floodplain Reconnection Project: Jon Hansen
• Green River 2015 Log Placement Projects: Andy Levesque
• Project Effectiveness Monitoring: Laura Hartema