Floodplain response to a large levee removal project on the Raging River, King County, Washington

King County Dept. of Natural Resources and Parks
Water and Land Resources Division
1936
1964
Project

(De)Construction
Carlin Levee Removal Project Goals:

- Allow for renewed channel migration and floodplain inundation.
  - Increase both mainstem and off-channel aquatic habitat complexity
  - Increase riparian patch complexity

- Protect adjacent public and private property from increased channel migration

- Document the level of success
Levee removal
Before/After Levee Removal
Removing Rip-rap Levee Toe

Removal of Toe Armor
Bank protection

240 ton mobile hydraulic crane
Planting
Invasives control
Carlin Levee Removal
Construction Summary

- Construction Period: July-August 2006
- Volume Removed: 5600 yd³
- Length of Levee Removed: 1350’
- Construction Cost: $228,000
Nov. 2006 flood event
Raging River near Fall City, (USGS Stream Gage 12145500)

![Graph showing discharge versus recurrence interval for the Raging River near Fall City. The graph displays a linear relationship between discharge (cfs) and recurrence interval (yrs). A specific data point for 11/6/2006, 4310 is highlighted.]
November 6, 2006 Flood
Monitoring Plan Overview

A work in progress

- Geomorphic Response
- Aquatic Habitat Response
- Riparian Vegetation Response
- Bank Protection
Geomorphologic Response
Geomorphic response

Channel Migration During the November 06, 2006 Flood

- Levee Footprint
- 2004
- 2007

Preston Falls City Road

500 Ft.
Raging River Profiles Before and After the November 2006 Flood

- Spring 2006
- Summer 2007
LWD Response
Upstream corner after project site immediately following construction.
Site During November 6, 2006 Flood
Woody Debris Jams

Mainstem

2007

Dan

Log Jam Formed During 2006 Flood
Woody Debris Jams
Left Bank Side-Channel, Tributary & Floodplain
2007
LWD In Contact with Flow
Floodplain Connectivity
Off-Channel Aquatic Habitat Availability

Low Flow

13 CFS @ Fall City
Off-Channel Aquatic Habitat Availability

Moderate/High Flow

1100 CFS Fall City
Off-Channel Aquatic Habitat Availability

High Flow - Flood Stage

~4000 CFS Fall City
11-06-06 4300 cfs
Vegetation Monitoring
Bank Protection Monitoring
Completed downstream boulder groups
Downstream boulder groups immediately following flood
Preliminary results

- Increased Floodplain Connectivity
- Increased Woody Debris Accumulation
- Improved Side Channel Habitat
- Successful Roadway Protection
- Reduction in Knotweed and Ivy Infestations
Funding for the Carlin Levee Removal Project

Salmon Recovery Funding Board
King County Surface Water Management Fees
National Oceanographic and Atmospheric Administration
King Conservation District
Project Collaborators

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THE END

(Thank You)