Circle Creek Ranch: Reducing Highway Flooding and Restoring Floodplains with a Wetlands Mitigation Bank
Location
Necanicum River

- 75 sq mi watershed
- Active Forestry
- Highways 101 and 26
Hwy 101 Flooding

- Cannon Beach – Seaside
  - Normal: 10 mi, 15 minutes
  - Flood: 70 miles, 2 Hours
Frequency and Costs

- Delay Costs
  - 10,500 ADT
  - Support ~$10m project
- Other Impacts
  - Schools
  - Hospital Access

Average Incidents/year: 3.3
Average Hours/year: 44
Stakeholders

- Oregon Department of Transportation
- Clatsop County
- Cities of Seaside, Cannon Beach, Warrenton, Gearhart & Astoria
- Port of Astoria
- North Coast Land Conservancy
- Local Businesses
- Community
Goals and Objectives

• **Goal:** Hwy 101 will provide uninterrupted function during most years
  – Significantly reduce frequency of 101 roadway restrictions and closures
  – Do not increase flood risk on nearby structures and infrastructure
  – Improve Necanicum River basin ecological conditions
  – Engage and inform the community and visitors
  – Focus on cost-effective, technically feasible and quickly implementable projects
Existing Conditions: Changes in Flood Behavior?

- Channel sedimentation – No
- Log Jams – Not at 101 problem locations
- Road Settlement – Possible
- Timber Harvest – Possible
- Climate Change/Variability – Possible
- Floodplain Construction - Yes
Lower Necanicum Floodplain
Topography

- Perched River
- Neawanna Creek
Human Impacts

- Berms
- Road Fill
- Building Fill
Flood Levels

- Perched River
- Fill Impacts
- Avulsion Risk
  - Utilities
Alternatives

- Beach Bypass
- Dooley Bridge
- Road Trestles
- Road Raises
- Berm Removal
- Avulsion Spillway
Alternatives Analysis

- Alternatives Ranked
- Preferred Alternative
  - West Bank Berm Removal
  - New Highway Berms
- Phased Approach
  - Hydrologic Uncertainty
  - Beerman Creek Bridge
Circle Creek Ranch

- NCLC Owned
- Long-Term Restoration Goals
- Supported Berm Removal
- Restoration $$ not in hand
Funding

• How to Fund?
  – Off of ODOT Right of Way
  – FEMA Mitigation Grant
  – Habitat Restoration Grant

• ODOT Wetland Mitigation Bank
  – Existing ODOT Program
  – Necanicum Watershed Mitigation Credits
  – Added Restoration Component
  – NCLC retains ownership
  – Immediate Implementation
Project Design & Construction

- Design 2012
- Constructed 2013
- Planting Ongoing
Project Design

• River Berm Removal
Project Design

- Floodplain Restoration
- Engineered Log Jams
Project Design

- Railroad Berm Removal
- Swamp Berm Removal
Results

• February 2014
Results

- September 2013 Flood
  - River 1.8 Ft Lower
  - No Road Flooding
  - 21 Hrs Flooding Avoided

- February 2014
  - Road barely flooded
  - 101 @ Junction flooded

- More effective than predicted
The Future

- Continued Restoration
- Continued Gaging
- Additional Actions??
  - New Berms, Bridges
  - Avulsion Risk Mitigation
Conclusion

• Gaging Network
• Single Landowner
• Simple & Low Cost Solution
• Mitigation Bank Funding
• Immediate Validation