Chehalis Basin Strategy

Washington State Transportation Commission
Briefing
April 26, 2017
The Chehalis Basin
History of Flooding

- Five largest floods occurred since 1986
History of Habitat Degradation

- Harvest has been limited by poor runs over the last 30 years
- Habitat productivity has been degraded by up to 87%
Effect of Climate Change Under Current Conditions

Potential Response in Salmon Abundance to Climate Change in the Chehalis Basin

<table>
<thead>
<tr>
<th>SPECIES (CURRENT HABITAT POTENTIAL)</th>
<th>CHANGE FROM CURRENT CONDITION (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coho salmon (40,642)</td>
<td>-55%</td>
</tr>
<tr>
<td>Fall-run Chinook salmon (25,844)</td>
<td>-27%</td>
</tr>
<tr>
<td>Winter/fall-run chum salmon (190,550)</td>
<td>-4%</td>
</tr>
<tr>
<td>Spring-run Chinook salmon (2,146)</td>
<td>-87%</td>
</tr>
<tr>
<td>Winter-run steelhead (6,800)</td>
<td>-55%</td>
</tr>
</tbody>
</table>
Governor’s Chehalis Basin Workgroup

• Tasked by Governor to recommend long-term strategy and budget for next biennium

• Current members are as follows:
  o Don Secena (*Chair, Chehalis Tribe*)
  o Gary Morishima (*Quinault Indian Nation*)
  o Vickie Raines (*Grays Harbor County Commissioner; Chair, Flood Authority*)
  o Karen Valenzuela (*former Thurston County Commissioner*)
  o J. Vander Stoep (*private attorney; Pe Ell Alternate, Flood Authority*)
  o Jay Gordon (*Washington Dairy Federation and Chehalis farmer*)
  o Steve Malloch (*Western Water Futures*)
  o Rob Duff (*Governor’s Natural Resource Advisor*)
  o Process managed and facilitated by William D. Ruckelshaus Center
Process

- 2007 Flood
- Alternatives Report 2012
- Appointment of Governor’s Chehalis Basin Work Group 2012
- Assessments of flood and habitat conditions 2012-2014
- Work Group’s Recommendation to create Draft Programmatic EIS and advance local flood and habitat projects
- Programmatic EIS Fall 2016
- Over 500 Comments received
- The Governor’s Chehalis Basin Work Group recommendations next steps and 2017-2019 budget
- Governor’s proposed budget
- Legislature will decide on funding in 2017
- Final Programmatic EIS June 2017
- Office of Chehalis Basin July 2017
The Chehalis Basin suffers from both flooding and degradation of aquatic species.

The Chehalis Basin Strategy will provide a long-term, integrated approach to substantially reduce damages from major floods and restore degraded aquatic species habitat in the Basin.
Actions Being Considered

• Flood Damage Reduction
• Habitat Restoration
Local-scale Flood Damage Reduction Actions

- Raising structures, building walls
- Farm pads

- Local Projects
Local-scale Flood Damage Reduction Actions

- Land use management improvements
- Early warning system improvements
Large-scale Flood Damage Reduction Actions

• I-5 Projects
• Walls and Levees
Aberdeen/Hoquiam North Shore Levee

• Provides 100-year coastal flood protection to Aberdeen and Hoquiam
• Approximately 5.8 miles of levees
Large-scale Flood Damage Reduction Actions

Restorative Flood Protection
• Re-establish the natural flood storage capacity by reversing landscape changes that contribute to downstream flooding and erosion
Large-scale Flood Damage Reduction Actions

- Flood Retention Only (FRO)
- Flood Retention and Flow Augmentation (FRFA)
Aquatic Species Habitat Actions

• Basin-wide scale: unprecedented level of effort
• Current average abundance 265,000 salmon and steelhead
• Increases range from 50,000 (18% increase) to 190,000 additional salmon and steelhead (73% increase)
• For spring-run Chinook salmon only, the current habitat potential (EDT) is 2,146 fish
• Increases for spring-run Chinook salmon range from approximately 2,000 additional fish (96% increase) to 15,000 additional fish (716% increase)
Comparison of Combined Alternatives
No Action Alternative

• Maintain status quo
  o Ongoing flood damage reduction actions and habitat improvements at historical funding levels (excluding recent legislative funding)
  o Actions to reduce flood damage and improve habitat conditions continue to a lesser extent than with an integrated strategy, and in a piecemeal fashion

• Limited localized benefits outweighed by ongoing risk of major floods and continued degradation of aquatic species habitat
Common Beneficial Effects Among the Action Alternatives

• **Aquatic Species Habitat Actions**
  - Would result in significant increases in salmonid abundance, and maintain or improve conditions for other species (such as amphibians)

• **Floodproofing and Local Projects**
  - Would reduce flood damage to structures and content, infrastructure and roads, and agriculture

• **Land Use Management**
  - Changes could improve protection for new developments within the 100-year floodplain

• **Flood Warning Systems Improvements**
  - Would result in increased accuracy with regard to forecasting flood timing and extents, and increased public safety
Reduce Flood Damage
Elements of Flood Damage

- Building structures
  - Homes, businesses, public
- Building contents
- Emergency aid
- Clean up of farms, roads
- Closure of I-5
- Crop damage
Flood Damage Reduction
State Perspective

100-Year NPV at 1.5% Discount Rate, $2016 in Millions

- Alternative 1
- Alternative 2
- Alternative 3
- Alternative 4

- Vehicle Damage
- Crop Damage
- I-5 Delay
- Clean-up Costs
- Emergency Aid
- Inventory
- Content
- Structure
## Transportation
### Reductions During a 100-year Flood

<table>
<thead>
<tr>
<th>I-5 closures (closed for 4 days during a 100-year flood)</th>
<th>NO ACTION ALTERNATIVE</th>
<th>ALTERNATIVE 1</th>
<th>ALTERNATIVE 2</th>
<th>ALTERNATIVE 3</th>
<th>ALTERNATIVE 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>No reduction</td>
<td>Reduced by 3 days</td>
<td>Reduced by up to 3 days</td>
<td>No reduction</td>
<td>No reduction</td>
<td>No reduction</td>
</tr>
</tbody>
</table>

| Flooding of SR 6, US 101, US 12, and local roads       | No reduction           | Reduced by 1 to 3 days | Reduced behind levee, increased on west side of I-5 (SR 6 and local roadways) | No reduction | Reduced in Chehalis-Centralia area by up to 1 day, could be increased on SR 6 (4 days), SR 506 (1 to 2 days), and SR 508 (2 days) |
Restore Aquatic Species Habitat
Comparison of Alternatives

• The low restoration scenario would generally not result in an increase in salmon, due to climate change
• Alternative 1 would result in significant increases over predicted changes from climate, but the increases would be less than other alternatives
  o Adverse impact of a dam on local salmonid populations would be reduced when combined with habitat actions
  o However, there would still be a significant adverse impact
• Alternative 4 would result in the greatest increase in salmon
Potential Response in Salmon Abundance in the Chehalis Basin to Climate Change with Different Action Alternatives

<table>
<thead>
<tr>
<th>ALTERNATIVE</th>
<th>LOW</th>
<th>HIGH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative 1 (FRFA)</td>
<td>4,700</td>
<td>120,000</td>
</tr>
<tr>
<td>Alternatives 2 and 3</td>
<td>5,000</td>
<td>140,000</td>
</tr>
<tr>
<td>Alternative 4</td>
<td>40,000</td>
<td>179,000</td>
</tr>
</tbody>
</table>
Results of Economic Analysis
Action Alternative Costs

High Restoration

Alternative Costs

- **Fro CHTR**
- **FRFA Conventional Fishway & Forebay Collector**
- **Alternative 2**
- **Alternative 3**
- **Alternative 4**

 Millions

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Aquatic Species Habitat Actions</th>
<th>Flood Retention Facility</th>
<th>I-5 Project</th>
<th>Airport Levee Improvements</th>
<th>Restorative Flood Protection</th>
<th>Floodproofing</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRO CHTR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FRFA Conventional Fishway &amp; Forebay Collector</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alternative 2</td>
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<tr>
<td>Alternative 3</td>
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<tr>
<td>Alternative 4</td>
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Flood Damage Reduction
State Perspective

100-Year NPV at 1.5% Discount Rate, $2016 in Millions

- Alternative 1
  - Vehicle Damage
  - Crop Damage
  - I-5 Delay
  - Clean-up Costs
- Alternative 2
  - Emergency Aid
  - Inventory
  - Content
- Alternative 3
- Alternative 4
  - Structure
Aquatic Species Habitat Restoration
State Perspective – Fishery Benefits

$2016, Millions

Alternative 1 with FRFA
Alternative 1 with FRO
Alternative 2
Alternative 3
Alternative 4

Low Restoration
High Restoration
## Results Summary

### State Perspective

<table>
<thead>
<tr>
<th>ALTERNATIVE</th>
<th>BENEFIT/COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALTERNATIVE 1</td>
<td></td>
</tr>
<tr>
<td>Low Restoration Scenario</td>
<td></td>
</tr>
<tr>
<td>FRO</td>
<td>1.6</td>
</tr>
<tr>
<td>FRFA</td>
<td>1.0</td>
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<tr>
<td>High Restoration Scenario</td>
<td></td>
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<tr>
<td>FRO</td>
<td>1.1</td>
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<tr>
<td>FRFA</td>
<td>0.8</td>
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<tr>
<td>ALTERNATIVE 2</td>
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<tr>
<td>Low Restoration Scenario</td>
<td>0.3</td>
</tr>
<tr>
<td>High Restoration Scenario</td>
<td>0.2</td>
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<tr>
<td>ALTERNATIVE 3</td>
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<tr>
<td>Low Restoration Scenario</td>
<td>0.3</td>
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<tr>
<td>High Restoration Scenario</td>
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<tr>
<td>ALTERNATIVE 4</td>
<td></td>
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<tr>
<td>Low Restoration Scenario</td>
<td>1.0</td>
</tr>
<tr>
<td>High Restoration Scenario</td>
<td>0.9</td>
</tr>
</tbody>
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**EXPECTED, DEPRECIATED VALUES 100-YEAR NPV 1.5% DISCOUNT RATE ($2016), MILLIONS**

- **FRO**: Final Restoration Option
- **FRFA**: Final Restoration for Assessable Option
• Office created by 2016 Legislature, will be initiated by funding in 2017-19 biennium.
• “aggressively pursue … long-term flood damage reduction and aquatic species restoration…”
• Established a Board to provide oversight for implementation of the Chehalis Basin Strategy
• “…provide a more unified, efficient, and consistent structure for policies and projects, especially for larger projects as they advance”.
$60M budget in Governor’s proposed budget for 2017-2019 biennium:

- $30.4 million to advance long-term strategy and determine preferred option for flood projects and habitat restoration
- $20 million for construction of habitat restoration projects ($10 million State, $10 million federal)
- $9.6 million for construction of local flood damage reduction projects
Advancing the Long-Term Strategy

- Completion of the Aquatic Species Restoration Plan
- Project level environmental review and initial permit applications for potential dam
- Detailed modeling and pre-permit design for one priority sub-basin for restorative flood protection
- Design and initial permit applications the Aberdeen/Hoquiam North Shore Levee project
- Continued public involvement and outreach to stakeholders
- Assessment of land use management and recommended improvements
Local Flood Reduction Projects

• Construct first tier of local flood damage reduction projects developed by the Chehalis River Basin Flood Authority.

• Continue working with local governments to ensure that new floodplain development does not impact floodplain ecological function or cause additional harm for residents and structures in the floodplain.

• Initiate a basin-wide floodproofing program with an early focus likely in Centralia and Thurston County, for elevation, acquisition, and other structure retrofit projects.
Aquatic Species Restoration

- Continued data collection, research, and analyses for salmonids and other aquatic species
- On-the-ground construction of high-priority projects:
  - Barrier removal
  - Floodplain and channel restoration
  - Acquisition of critical habitats
Questions/Discussion
Thank you!

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