Statewide:
• Over 100 cities and counties
• 4 Phase I counties must prepare watershed-scale stormwater plan
Watershed-scale Stormwater Plan Requirements

• Develop Watershed-scale (Basin) plan addressing:
  1. Fecal Coliform
  2. Dissolved Copper & Zinc
  3. Temperature
  4. B-IBI (aquatic / biological health)

• Evaluate stormwater strategies
• Submit to Department of Ecology by September 6, 2017
Overall Timeline

<table>
<thead>
<tr>
<th>Select Watershed</th>
<th>Collect Data</th>
<th>Develop Model</th>
<th>Develop Solution</th>
<th>Submit Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>2014-16</td>
<td>2016</td>
<td>2016-17</td>
<td>9/2017</td>
</tr>
</tbody>
</table>
Plan Objective

To identify stormwater strategies that will meet water quality standards that support use of Little Bear Creek for people and aquatic life
Creating the Plan

Existing Conditions
- Modeling Set-up
- Calibration

Forested Conditions
- Reference: Water Quality Biology

Future Conditions
- Water Quality Standards
- Biological Targets

Management Strategies
- Stormwater Facilities
- Policies & Programs
- Instream Projects
## Projected Future Conditions

<table>
<thead>
<tr>
<th></th>
<th>STANDARD</th>
<th>FUTURE BUILD-OUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dissolved Zinc</td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>Dissolved Copper</td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>Temperature</td>
<td></td>
<td>❌</td>
</tr>
<tr>
<td>Fecal Coliform</td>
<td></td>
<td>❌</td>
</tr>
<tr>
<td>B-IBI (aquatic health)</td>
<td></td>
<td>❌</td>
</tr>
</tbody>
</table>
Stormwater Facilities

Fecal Source Control

Temperature & Instream
Analysis Approach

Additional Actions

Modeled Strategies

Future Conditions

Optimization Tool

Watershed Model

Modeled Solution
## Strategies in Modeled Solution

<table>
<thead>
<tr>
<th>BMP TYPE</th>
<th>STRATEGY</th>
<th>TOTAL FOR STUDY AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low Impact Development (LID)</strong></td>
<td>Filter Strip</td>
<td>64 miles</td>
</tr>
<tr>
<td></td>
<td>Modified Ditches</td>
<td>30 miles</td>
</tr>
<tr>
<td></td>
<td>Rain Gardens</td>
<td>7.4 acres</td>
</tr>
<tr>
<td></td>
<td>Bioretention</td>
<td>6.1 acres</td>
</tr>
<tr>
<td></td>
<td>Permeable Pavement</td>
<td>3.7 acres</td>
</tr>
<tr>
<td><strong>WQ Filtration</strong></td>
<td>Biofiltration</td>
<td>0.9 acres</td>
</tr>
<tr>
<td><strong>Detention</strong></td>
<td>Wet Pond</td>
<td>246 acre-feet</td>
</tr>
<tr>
<td><strong>Buffer Restoration</strong></td>
<td>Riparian Planting</td>
<td>204 acres</td>
</tr>
</tbody>
</table>
Basin-wide BMP Distribution

**Footprint Area**
- Buffer Restoration: 59%
- LID: 29%
- Detention: 12%
- WQ Filtration: 0.3%

**Cost**
- Detention: 58%
- LID: 24%
- WQ Filtration: 17%
- Buffer Restoration: 1%
Little Bear Creek Subbasins
## Projected Future Conditions

<table>
<thead>
<tr>
<th>STANDARD</th>
<th>FUTURE BUILD-OUT</th>
<th>FUTURE BUILD-OUT WITH PLAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dissolved Zinc</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Dissolved Copper</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Temperature</td>
<td>●</td>
<td>✓</td>
</tr>
<tr>
<td>Fecal Coliform</td>
<td>●</td>
<td>✓</td>
</tr>
<tr>
<td>B-IBI (aquatic health)</td>
<td>●</td>
<td>✓</td>
</tr>
</tbody>
</table>
Modeled Solution + Additional Actions = Basin Plan Solution
Basin Plan Content

• Summary of modeling and planning process
• Description of the strategy evaluation
• Implementation Plan
• Appendices
# Estimated Costs

<table>
<thead>
<tr>
<th>Component</th>
<th>New</th>
<th>On-Going</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modeled Strategies</td>
<td>$288.6 M</td>
<td></td>
<td>$288.6 M</td>
</tr>
<tr>
<td>Non-Modeled Strategies</td>
<td>$13.5 M</td>
<td>$2.5 M</td>
<td>$16.0 M</td>
</tr>
<tr>
<td>Support</td>
<td>$2.3 M</td>
<td>$1.3 M</td>
<td>$3.6 M</td>
</tr>
</tbody>
</table>

**Total Estimated Costs**  $308.2 M  
(2016 dollars, PV, figures rounded)
30 Year Timeframe

Start-up
- Years 1-6
  - $9 M

Priority 1
- Years 7-14
  - $83 M

Priority 2
- Years 15-22
  - $83 M

Completion
- Years 23-30
  - $132 M

Costs in 2016 Dollars (Present Value), Schedule is Funding Dependent
Implementing the Plan

• Current WQ programs and projects to continue:
  o County
  o WSDOT

• Over 95% of costs to be funded through grants

• Voluntary contributions from other organizations
  o Local Government, Special Purpose Districts, Tribes, Community groups
What the County is Already Doing

1. Natural Yard Care Education workshops, online resources
2. Pet Waste Program outreach: veterinary clinics, public open spaces
3. Septic Care Workshops & Savvy Septic outreach and finance program
What the County is Already Doing

4. Pollution Source Control Programs
   business inspections, detention facility inspections, water quality hotline

5. Streamside Landowner program
   restoration of riparian vegetation (shade, water quality, aquatic habitat)
More Resources Being Developed

“The Runoff Guide”

- Low Impact Development principles and practices for homeowner use
- Available January 2018
What Can You Do?

- Participate in programs that promote water quality
- Continue to practice good stewardship
Questions and Answers
Next Steps: Finalizing the Basin Plan

• Please provide comments on the plan by July 6.

• Comments will be considered in the Plan and posted on the website www.littlebearcreek.surfacewater.info

• Plan will be submitted to Ecology on September 6, 2017.
We appreciate your feedback and participation!

Arthur Lee, PE, Project Manager
425-388-3812
Arthur.Lee@Snoco.org

www.littlebearcreek.surfacewater.info