Integrating Nature Based Solutions Through Multi-Objective Projects

OR

How Did The Salmon Cross The Road?

Nathan Woiwode
North America Water
nwoiwode@tnc.org
Nature-based solutions are the intentional use of natural features and functions as integral part of addressing a human need. The use of nature-based solutions includes the protection and restoration of natural processes and systems as an explicit part of the desired project outcome.
How do we operationalize Nature Based Solutions?

Build natural function into project design -- avoiding environmental impacts is not sufficient.

Protection and restoration of nature need to become a project purpose.

Designing to meet multiple needs and provide multiple benefits is key – creates synergies and new opportunities.
Napa, California
Development Along Napa River

Napa Mill
(Napa River Inn, Celadon, Angele, General Store, Silo’s)

Riverbend Plaza

Riverfront Promenade and Floodwalls

Veterans Park

Boat dock (future)

Third Street Bridge

The Riverfront
(Morimoto, Tyler Florence, Fish Story, Napa River Velo)

Fifth Street Plaza

Kyser-Lui-Williams
(Cole’s Chop House Ubuntu, Annalien)

First Street Bridge

NV Opera House Theater

Opera House Plaza at Napa Creek

Slide from Association of State Floodplain Managers
Seattle Public Utilities
Culvert Replacement & Stream Stabilization Project
## Triple Bottom Line Asset Management Analysis
Seattle Public Utilities

<table>
<thead>
<tr>
<th>Avoided SPU Financial Risk Costs</th>
<th>Base Case</th>
<th>Opt. 2 w/o Grade Control</th>
<th>Opt. 2 w/ Grade Control</th>
<th>Opt. 3 DB or DBB</th>
<th>Opt. 4 DB or DBB</th>
<th>Opt. 5 DB or DBB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduces Risk to SPU &amp; KC Sewer Crossings</td>
<td>1</td>
<td>2</td>
<td>4.5</td>
<td>3</td>
<td>4.5</td>
<td>4.5</td>
</tr>
<tr>
<td>Reduces Risk to SPU Water Services</td>
<td>1</td>
<td>5</td>
<td>5</td>
<td>1</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td><strong>Avoided Social Risk Costs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduces Risk of Customer Sewer Outage</td>
<td>1</td>
<td>2</td>
<td>4.5</td>
<td>3</td>
<td>4.5</td>
<td>4.5</td>
</tr>
<tr>
<td>Reduces Risk of Customer Water Outage</td>
<td>1</td>
<td>5</td>
<td>5</td>
<td>1</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Reduces Risk of Road Access Being Cutoff</td>
<td>1</td>
<td>5</td>
<td>5</td>
<td>1</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td><strong>Environmental Benefits / Avoided Risk Costs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improves In-Stream Habitat</td>
<td>0</td>
<td>1</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Removes Fish Passage Barrier</td>
<td>0</td>
<td>5</td>
<td>5</td>
<td>0</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Reduces Risk of Damage to Stream and Banks</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td><strong>TOTAL:</strong></td>
<td>6</td>
<td>27</td>
<td>39</td>
<td>15</td>
<td>38</td>
<td>38</td>
</tr>
</tbody>
</table>

0= None, 1= Low Benefit, 5= Most Benefit
NE 105th St & 17th Ave NE
Culvert Replacement & Stream Stabilization Project
Floodplains by Design

Multi-benefit Funding Program - State of Washington
Characteristics of FbD Projects:

Ideal projects are part of a strategy that is tailored to the specific reach of a river which reduces flood risk to affected communities, restores ecological function and is a net gain for other community interests. In areas, where agriculture is a dominant land use, projects need to be part of a strategy that provides a net gain for agriculture as well as enhance ecological function.
Puyallup River in the streets due to flooding
• Salmon Recovery Funding Board: $2.3 million
• Department of Ecology 2012 Stormwater Grant: $1.3 million
• Department of Ecology – Floodplain by Design: $4.7 million
• Pierce County Flood Control Zone District: $8.5 million
• Public Works Trust Fund Loan: $4 million
• USDA-RD Loan: $3 million
• City of Orting $2.6 million from storm water fund
Floodplains by Design in Washington State

The Floodplains by Design partnership is harnessing the collective strength of agencies, nonprofits, and local communities to restore salmon populations, reduce flood hazards, increase agricultural viability, improve water quality, and enhance outdoor recreation.
The Naturally Resilient Communities Partnership

FIND YOUR SOLUTION at NRCSolutions.org
EXPLORE THE DIFFERENT TYPES OF NATURE-BASED SOLUTIONS

COASTAL FLOODING & EROSION

RIVER FLOODING & EROSION

URBAN STORMWATER FLOODING

FIND YOUR SOLUTION
A vision for the future:

Bridgeport, Connecticut