Large wood and recreation safety;
Will the other shoe drop?

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BACKGROUND

Washington Restoration Funding

- 2011 SRFB Funding Allocation ~ $18 Million
- 2011 Puget Sound Restoration Funds ~ $13.5 Million

$15 Million for Instream

$11 Million for ELJs
What if this event;

“Woman drowns in rafting accident on Wenatchee River Victim got pulled under log jam...” *

Was actually this event;

“Woman drowns in rafting accident on Wenatchee River Victim got pulled under log jam” *placed as part of a restoration project*

* Wenatchee World 07-11-2011
Risk is a function of:

- Probability
- Consequence

Risk related to habitat restoration:

- Flooding
- Infrastructure
- Recreational
- Habitat
APPROACH

Risk related to recreational use;
• Reach attributes
• Structure characteristics
1. Define the recreational use
   • Frequency of use
   • Access to reach
   • Preferred flow range
REACH ATTRIBUTES

Flow Duration Curve:
North Fork Nooksack River
USGS Gage 12205000

Discharge (cfs)

Percent of time flow was equaled or exceeded (%)
1. Define the recreational use
   • Frequency of use
   • Access to reach
   • Preferred flow range
   • Ability or maneuverability of use
2. Determine geomorphic indices
   • Channel Type
   • Gradient
REACH ATTRIBUTES

1

2

3
2. Determine geomorphic indices

- Channel Type
- Gradient
- Frequency of natural large wood
- Stability (channel migration)
REACH ATTRIBUTES

1

2
3. Define the location

- Outside of a channel bend?
- Within the wetted channel during the preferred flow range?
STRUCTURE CHARACTERISTICS
4. Define the characteristics of the structure

- Strainer potential
- Racking potential
- Structure type

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Relative recreational risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step</td>
<td>Single log structure spanning the channel width and forming a scour/plunge pool immediately downstream. Flow generally proceeds over the structure.</td>
<td>Low to moderate</td>
</tr>
<tr>
<td>Valley</td>
<td>Multiple log structure with a width greater than the bankfull width and accompanying a significant portion of the valley width. Flow through and over the structure.</td>
<td>High</td>
</tr>
<tr>
<td>Revetment</td>
<td>Multiple log structure located along the outside of channel bend, a width less than the bankfull width, and creating a bench surface. Flow generally proceeds along the structure.</td>
<td>Moderate</td>
</tr>
<tr>
<td>Bankfull bench</td>
<td>Multiple log structure located along the outside of channel bend, a width less than the bankfull width that accumulates wood over time. Flow generally approaches normal to the structure and is then deflected away at a moderate to severe angle via parallel log members.</td>
<td>Moderate to high</td>
</tr>
<tr>
<td>Flow deflection</td>
<td>Multiple log structure located along the outside of channel bend, a width less than the bankfull width that accumulates wood over time. Flow generally approaches normal to the structure and is then deflected away at a moderate to severe angle via parallel log members.</td>
<td>Moderate to high</td>
</tr>
<tr>
<td>Deflector</td>
<td>Multiple log structure located at the head of mid channel bar, a width less than the bankfull width, creating a stable depositional zone downstream. Flow generally proceeds along the structure.</td>
<td>Low to moderate</td>
</tr>
<tr>
<td>Bar apex</td>
<td>Multiple log structure located along the outside of channel bend, a width less than the bankfull width, and creating a bench surface. Flow generally proceeds along the structure.</td>
<td>Moderate to high</td>
</tr>
<tr>
<td>Meander</td>
<td>Multiple log structure located along the outside of channel bend, a width less than the bankfull width, and creating a bench surface. Flow generally proceeds along the structure.</td>
<td>Moderate to high</td>
</tr>
</tbody>
</table>

3. Define the avoidance potential

- Can the structure be portaged?
- What is the wading safety factor?
  - $\text{WSF}^* = \text{Velocity} \times \text{Depth}$
- Sight Distance

STRUCTURE CHARACTERISTICS
ASSESSMENT MODEL

More Consideration

Less Consideration

RECREATIONAL SAFETY

Moderate

Moderate

RECREATIONAL RISK

Low

High

Relative Risk

Low

High

Relative Safety

Low

High

STRUCTURE CHARACTERISTICS

Yes

Active channel?

No

Yes

Outside of bend?

No

High

Strainer potential

Low

Low

Egress potential

High

Low

Sight distance

High

High

Depth velocity product

Low

High

Beginner

Good

Confined

Cascade

Steep

REACH CHARACTERISTICS

Frequency of use

Skill level

Access

Valley type

Channel type

Gradient

Mild

Low

Advanced

Poor

Broad

Pool/riphle
Risk can be mitigated through

- Public education/outreach
- Public notification
- Signage
- Monitoring and/or adaptive management
HOW TO MOVE FORWARD

1. Address concerns through planning process

2. Change **PUBLIC PERCEPTION** of large wood and its beneficial functions.
   - “Clean rivers” are not a natural/healthy state
   - LWD support and create beneficial habitat
Thank you

Question/Comments

Special thanks to John Monahan, Jill Komoto, Alex Levell, Will Conley, Thomas O’Keefe, Michael, Grilliot, Cynthia Cook, and Katy Vanderpool.