Protecting Shorelines: Alternative Stabilization Techniques

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Port of Seattle
• Nineteen sites
• Over 100 acres
• One-third already restored
• Many w/ public shoreline access
• Mostly estuarine and marine habitat
Developed sites
Terminal 117
On-Slope Riparian (> +12’ MLLW)
Shellfish & Mudflat (+8’ to -2’ MLLW)
Marsh plants (+12’ to +8’ MLLW)
Eelgrass (-2’ to -12’ MLLW)
Kelp (-12’ to -24’ MLLW)

Smith Cove Blue Carbon

Smith Cove Park
Elliott Bay Marina
Cruise Terminal
Port Shorelines

- Port of Seattle owns 16 miles of shoreline
- Over 90% armored (rip-rap, bulkhead, etc)
- Habitat for listed species
- Increasing pressure due to sea-level rise and climate change
- Maintenance and repair actions subject to challenging regulations
Bankline Stabilization Programmatic Permit

- Framework of pre-approved solutions
- Solutions ladder from a fully restored bankline solution through maintenance of existing infrastructure
- Characterize existing bankline conditions
- Evaluate feasibility of enhancement
Decision Tree

• **Environmental enhancement** through alternative and/or in-kind repairs where feasible

• Allow **in-kind repair/replacement** where enhancement infeasible

• No expansion of hard structural stabilization allowed through programmatic permits

• Align with regulatory framework
Alternative Stabilization w/ Natural Elements
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## Programmatic Governance

<table>
<thead>
<tr>
<th>Facility/Project Name</th>
<th>Project Completion Date</th>
<th>Pre-treatment Condition</th>
<th>Post-treatment Condition</th>
<th>HEA value (dSAYs)</th>
<th>Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>T91 Cruise Repair</td>
<td>TBD</td>
<td>Conventional Armored Slope</td>
<td>Sloped Bulkhead</td>
<td>-0.12</td>
<td>Marine</td>
</tr>
<tr>
<td>T104 Intertidal Bench</td>
<td>1992</td>
<td>Conventional Armored Slope</td>
<td>Conventional Armored Slope, Intertidal Bench</td>
<td>+0.30</td>
<td>Estuarine</td>
</tr>
<tr>
<td>South Park 8th Ave S Public Access and South Riverside Drive (2 projects)</td>
<td>2015</td>
<td>Conventional Armored Slope</td>
<td>Transitional Anchor System, Emergent Marsh Bed, Top of Slope Riparian, On-slope Riparian</td>
<td>+2.67</td>
<td>Estuarine</td>
</tr>
<tr>
<td>Project 4</td>
<td>2019</td>
<td>Vertical Bulkhead</td>
<td>Conventional Armored Slope and Top of Bank Riparian</td>
<td>+1.50</td>
<td>Marine</td>
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<tr>
<td><strong>Running Total (dSAYs)</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>6.52</strong></td>
<td></td>
</tr>
</tbody>
</table>
Results

• Continue to protect Port assets from bankline failure and vessel wake, wind and current erosion
• Employ best management techniques from agency perspective,
• Self mitigate for construction by improvement or at least not increasing size or making worse.
• Track improvements over time
• Work permitted for 10 years
Transition Anchor System
West Yard Top of Slope Riparian System
South Riverside Before
Transition Anchor System
questions