In situ management of contaminated sediment, habitat restoration and community interests – can they co-exist?

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9th International SedNet Conference, 23-26 September 2015, Kraków, Poland
Overview

• An approach for integrating goals
  - Think beyond separate directive/regulatory processes
  - Focus on risk reduction and ecosystem function together
  - Include stakeholders early and often

• Case studies
Begin with the end in mind...

• Develop vision framework early
  - Know the required elements first
  - Process for stakeholder input, public-private partnerships
  - Timing of community feedback
  - Mine feedback for useful information

• Perception of success linked to visual project elements
Understand the problem(s) and establish goals
Develop and evaluate integrated solutions

• Understand future land use and ownership
• Evaluate potential alternatives using multiple criteria
• Optimize diverse, high functioning habitats
  – Support fish, plants, BMI, birds, amphibians, reptiles, mammals
• Consider use of adaptive management

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Engineering the details

Example Enhanced Cap with Wetland

Overplacement
Habitat Layer (Sand and Topsoil)
Erosion Protection
Overplacement
Isolation Layer (Sand and TOC)
Mixing Layer

6"
12"
3"
6"
12"
3"

3'6"

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Benefits

• More efficient and cost-effective projects meeting cleanup and ecological goals in parallel
• Working with nature opportunities
• Public involvement and perception
• Improved aesthetics
• Potential public access
Project Examples from Washington State, USA

St. Paul Waterway: Commencement Bay, Tacoma
Whatcom Waterway Log Pond: Bellingham Bay
Olympic Sculpture Park: Downtown Seattle
St. Paul Waterway Project

- One of first integrated projects
- Part of larger Commencement Bay USEPA Superfund Site – habitat restoration and cleanup work completed in 1988 before bay-wide remedy
- Cleanup and natural resource damage resolution
- Considerable stakeholder involvement
- Consistent with ongoing paper mill operations
Remediation and Restoration Overview

- Up to 6 meters of clean with sands and silts similar to upstream river sediments placed over a 6.9-hectare area to restore intertidal habitat
- Cobbles and boulders placed in intertidal and shallow subtidal areas to enhance long-term beach stability and improve habitat diversity
Benefits of Integrated Approach

• Cooperative projects have multiple benefits
  - Process and implementation efficiencies
  - Overall project was highly cost-effective

• Integrated intertidal habitat restoration and cleanup

• Success confirmed with 25+ years of monitoring
  - Rapid recolonization
  - Chemical isolation
  - Future monitoring now tied to episodic events (e.g., storm surges, earthquakes)
Whatcom Waterway Log Pond Site

• Comprehensive study identified need for shallow water aquatic restoration in Bellingham Bay salmon estuary

• Natural recovery timeframes too long to support cleanup

• Dredging approach challenges
  - Short-term water quality impacts
  - Structural impacts to facilities
  - Higher cost with fewer benefits

• Capping selected as cleanup
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Capping/Habitat Restoration Approach

• 1-meter thick cap required to meet cleanup goals
• Enhancement to salmon estuary through creation of 2.4-hectare intertidal beach
Monitoring Confirmed Restoration Success

- Opportunity for collaborative project with local university
- Cap continues to be protective
- Highly productive benthic and riparian communities established within few years
- Major increase in use by salmon and other forage fish
- Eelgrass meadow restoration after several years
Seattle Olympic Sculpture Park

• Fuel storage and transfer facility constructed in early 1900s, operating until 1975
• Seattle Art Museum (SAM) purchased site in 2000
• Company addressed major environmental cleanup issues
• State provided grants to assist SAM with continued cleanup and redevelopment of publicly-owned site
Site Transformation

http://www.weissmanredi.com/project/seattle-art-museum-olympic-sculpture-park
Shoreline Restoration and Salmon Habitat
Can the goals co-exist?

- Yes, with early planning and engagement of stakeholders
- Requires strong public and agency support
- Think beyond the ‘sediment cleanup’ project
- Develop integrated solutions and weigh benefits
- Integration of community interests is most challenging
Questions?

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