

Integrating Biodiversity into Urban Shorelines

Presented by:

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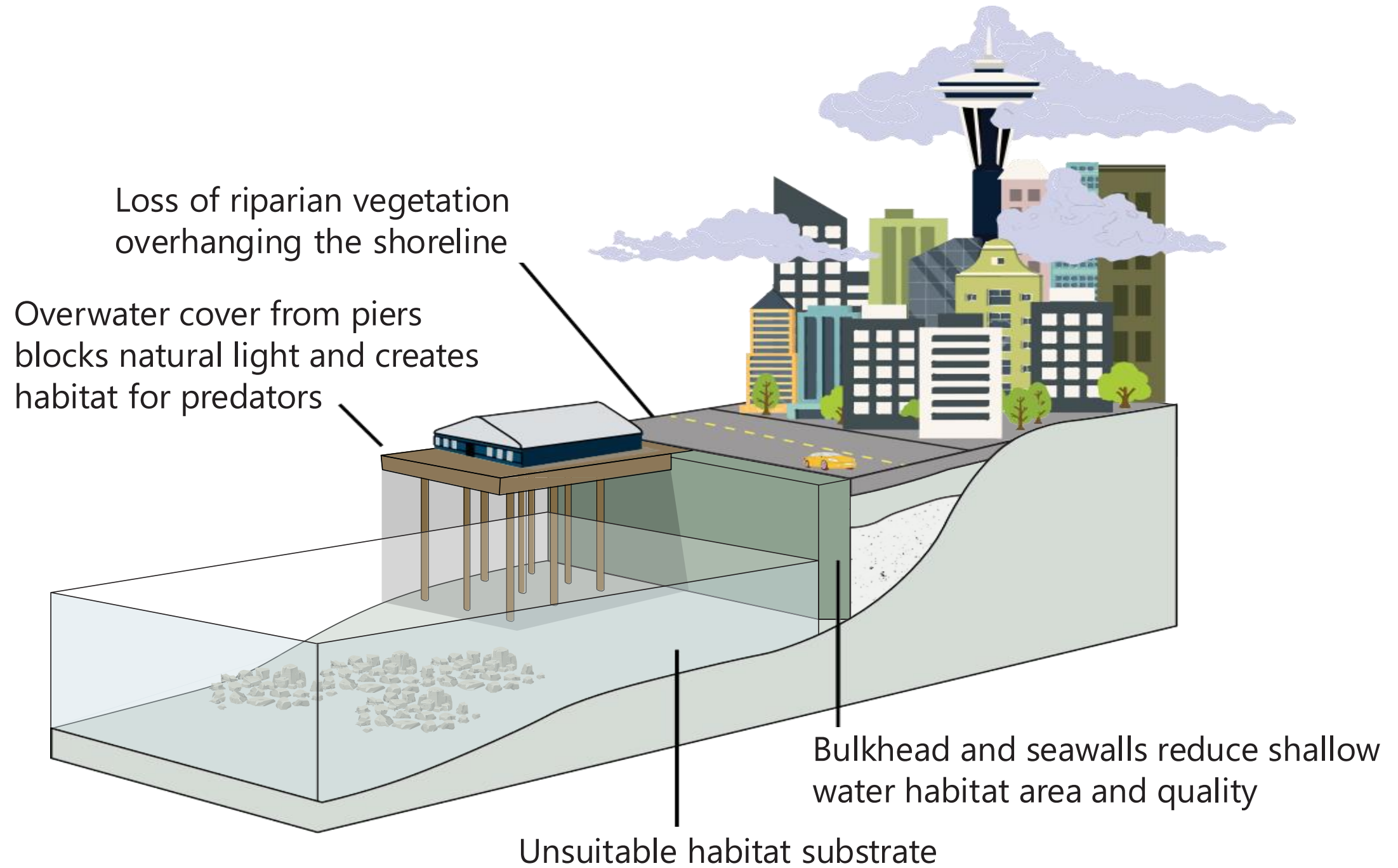
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Learning Objectives

- Review opportunities to enhance biodiversity, resilience, and community value through urban shoreline transformation
- Identify design strategies that support ecological function
- Understand regulatory and collaborative approaches that align ecological goals with regulations
- Apply lessons from other waterfront projects to inform urban restoration planning and implementation

Design Considerations: Maximizing Ecological Potential





Translate and Define for Design

- Water levels
- Target habitats
- Material types
- Habitat features

Riparian

Backshore

Intertidal

Subtidal



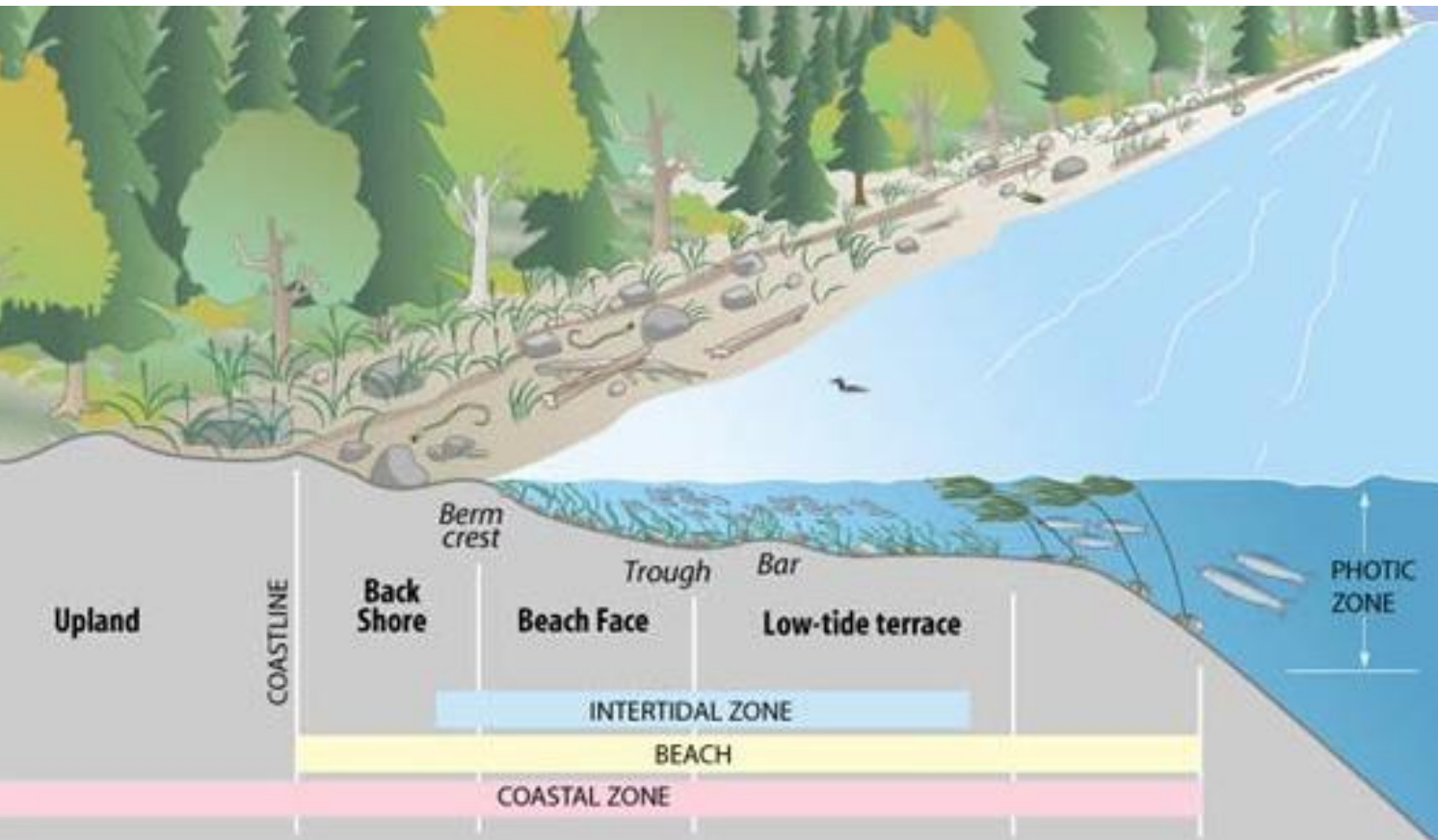
Monitor and Adapt



Railroad Avenue Seawall Seattle, 1935



Source: Seattle Municipal Archives








Elliott Bay

Elliott Bay Connections

Olympic Sculpture Park

Seattle

Restoration Interventions

-  Beach
-  Improved riparian edge
-  Intertidal habitat bench
-  Seawall habitat improvement
-  Light-transmitting overwater surfaces

Seawall and Piers 58, 62/63

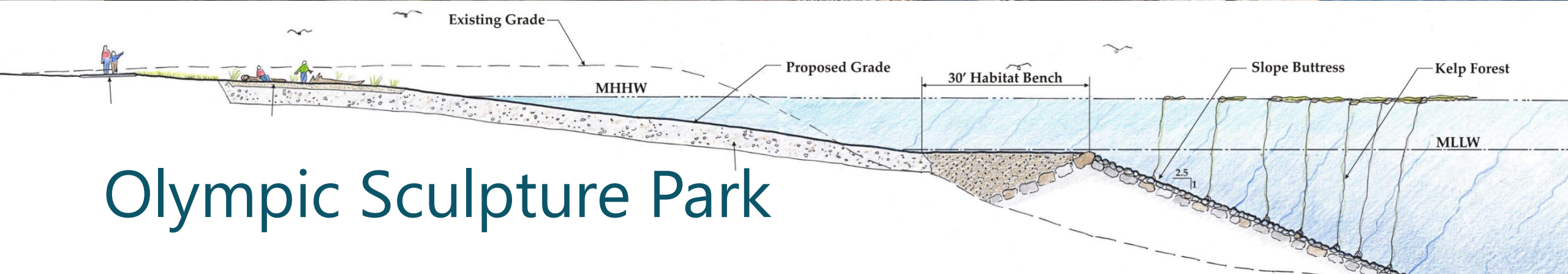
Habitat Beach





Backshore

Intertidal



Olympic Sculpture Park



Riparian Edge





Habitat Beach

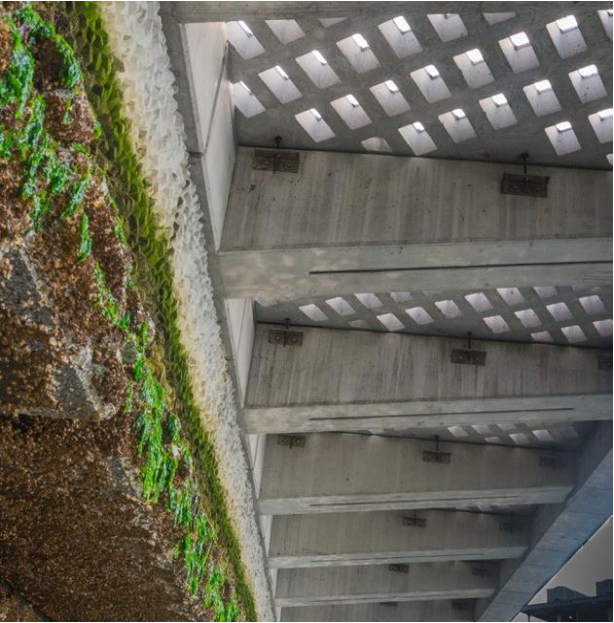
Seawall Intertidal Bench: Linear Migration Corridor



Seawall Habitat Improvements: Fins and Textures



Seawall and Piers: Light-Penetrating Surfaces



Pier 63
Removed

Pier 62
Reconstructed

Pier 58
Reduced and
Reconstructed

Elliott Bay Connections



Expanded Beaches: Intertidal and Backshore with Riparian Edge



Regulatory Challenges: Innovative Ideas for Habitat Projects

Shoreline Restoration in a Regulatory Context

- Urban shoreline projects must balance innovation with regulatory compliance
- Permitting frameworks can both constrain and enable ecological outcomes
- Success depends on integrating science, design, and regulations from the outset



Framing the Opportunity

- Document baseline habitat conditions
- Provide regional context for restoration
- Identify habitat enhancement/restoration opportunities
- Develop creative solutions that meet both ecological and regulatory requirements



Streamlining Restoration Regulatory Pathways

Federal

U.S. Army Corps of Engineers Individual

U.S. Army Corps of Engineers Nationwide

- NEPA compliance is complete
- Reduce public controversy
- Faster timelines

Endangered Species Act (ESA)

Section 106 of the National Historic Preservation Act

State

State Programs to Expedite Compliance

- Alaska: Fish Habitat Permits
- Washington: Joint Aquatic Resource Permit Application

California: Cutting the Green Tape

- CEQA Statutory Exemption for Restoration Projects (SERP)
- Restoration Management Permit (RMP)

First Mile Horizontal Levee



Early and Ongoing Collaboration

- Engage regulators, Tribes, and stakeholders early in project development
- Shift from minimum compliance to maximizing ecological function
- Build shared understanding to reduce risk and rework



Lessons Learned: Urban Restoration Planning and Implementation

Key Takeaways

- Bridge disciplines for better outcomes
- Shift from compliance to ecological uplift
- Start early, collaborate across regulatory and Tribal interests, and communicate often



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