



Reconnection, Restoration, Resilience

The 1.3-acre estuary at Meadowdale Beach Park is the first stream mouth restoration along Puget Sound—a strategic move to improve habitat and public safety along a 25-mile stretch of the BNSF Railway from Everett to Seattle.



The need to create safe access to Meadowdale Beach Park's shoreline created an opportunity to integrate public safety, ecological restoration, and resilient landscape and infrastructure into a community-driven and interdisciplinary design.



Since the BNSF railroad's construction in the 1800s, almost all pocket estuaries on the eastern shore of Puget Sound between Tacoma and Everett have been lost. The restored pocket estuary at Meadowdale Beach Park provides safe and productive rearing habitat to threatened juvenile Chinook salmon, among other species.

SAFE PUBLIC BEACH ACCESS

SALMON HABITAT

FLOOD AND SEDIMENT MANAGEMENT

SEA LEVEL RISE

SNOHOMISH COUNTY

Meadowdale Beach Park

Project Limits

Lunds Gulch Creek

To Edmonds

Meadowdale Beach Park offers Snohomish County, a dense and diverse urban community, vital public access to forest and beach.

PUGET SOUND

The beach is one of two public shoreline access points between downtown Edmonds and Mukilteo.

Flooding from sediment buildup behind the former culvert impacted access to the water. Visitors could either walk through the narrow culvert that was often flooded with tidal waters or risk climbing over the railroad tracks.

Meadowdale Beach Park is located within Lunds Gulch, a ravine with steep slopes, up to 40% grade. Steeps slopes cause frequent landslides and sediment buildup, an important ecological process to nourish shoreline beaches.

The BNSF railroad runs along 46 miles of Puget Sound shoreline. Construction of the railway berm impacted creeks and estuaries and resulted in hundreds of culverts to convey water.



Meadowdale Beach Park

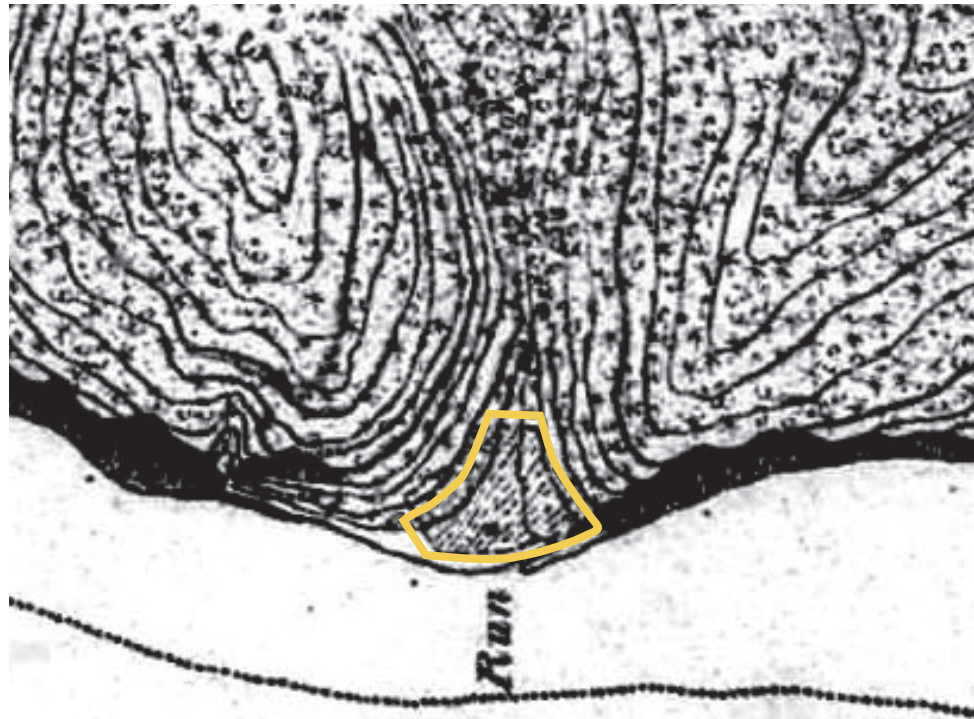


North

To Mukilteo



Research from Tulalip Tribes confirmed juvenile Chinook, coho, and chum salmon and cutthroat trout used the culvert passage from Lunds Gulch Creek to the Sound.



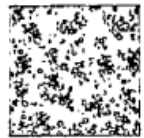
U.S. Coast Survey T-Sheet (1872)



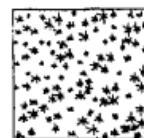
Culvert and Lawn Fill (1977)



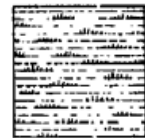
Restored Estuary, Channel, and Bridge (2023)



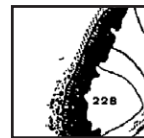
Roundleaf



Conifer



Salt Marsh



Bluff

1800s

1900s

2000s

Sediment buildup at the culvert connecting Lunds Gulch Creek to the Puget Sound caused frequent flooding and impacted salmon habitat. Replacing the culvert with a new railroad trestle resulted in the restoration of the estuarine marsh and stream habitat that was historically present.



The restored estuary and lower creek freshwater habitats reintroduce shoreline coastal ecosystem processes including creek dynamic meandering, coastal wave influences on sediment transport and deposition, salt and freshwater development in brackish waters, and accumulation of detritus and wood.

- 1 Restored Historical Channel
- 2 Railroad Bridge
- 3 Intertidal Creek Mouth
- 4 Beach Backshore
- 5 Emergent Tidal Marsh
- 6 Freshwater Marsh
- 7 Marine Riparian Zone
- 8 Stream Riparian Zone
- 9 Improved Lawn Area
- 10 Stormwater Swale
- 11 Large Woody Material
- 12 Habitat Snags
- 13 Beach Access Plaza
- 14 ADA Underpass Pathway to Beach
- 15 Pedestrian Bridge and Boardwalk
- 16 Restroom Enclosure
- 17 Picnic Shelter
- 18 Landslide Protection Structure



PUGET SOUND



Once primarily a non-native grass lawn, the design reintroduces the landscape to native riparian and tidal plant communities. Plant communities were installed in habitat zones designed according to elevation and inundation frequency.



1 Beach Backshore



Checkerbloom Coastal Sand Verbena Dunegrass

2 Emergent Tidal Marsh



Piggy-Back Plant Douglas Aster Pacific Silverweed

3 Freshwater Marsh



Slough Sedge Skunk Cabbage American Three-Square

4 Marine Riparian Zone



Black Twinberry Redosier Dogwood Saskatoon Serviceberry

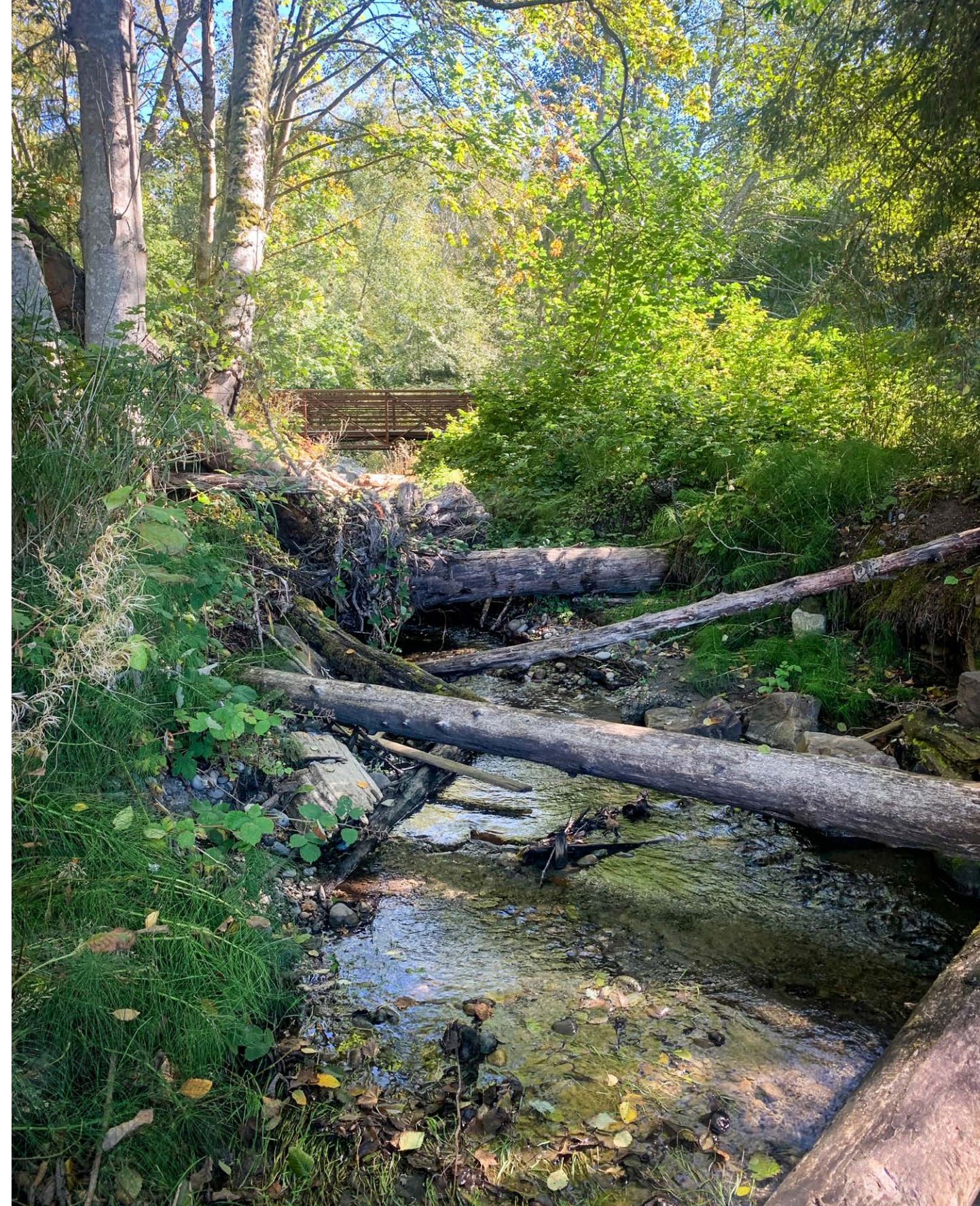
5 Stream Riparian Zone



Red Elderberry Thimbleberry Mock Orange



An ADA-compliant pathway under the railway bridge ensures safe access to the beach, free of deposited sediments and flood waters year-round that impacted the previously constricted underpass. It allows the visitor to be right at the center of a dynamic intersection of busy railroad traffic, daily high and low tides, and rush of Lunds Gulch Creek.



A new concrete and weathering steel pedestrian bridge traverses Lunds Gulch Creek to connect the upper and lower sections of the park and provide views of the salmon-bearing creek. Salvaged trees are used as large woody material and habitat snags throughout the creek and estuary to improve fish habitat.



Material selection for the renovated path, benches, and structures prioritize long-term sustainability. The selected concrete, weathering steel, and asphalt are durable and will perform well in the rainy Western Washington climate. A simple palette complements the forested ravine, cobble, vegetated estuary, and other organic elements of the park.

Interpretive signs describe geologic and site history, natural sediment flows, scope of restoration, and importance of pocket estuary habitat to salmon.



The accessible pathway terminates in a curved beach front concrete plaza. The plaza provides a place to rest and view the water from solid ground. An interpretative sign provides historical context and an invitation to take care of the Salish Sea.



Construction of the five-span railroad bridge was accomplished under live train traffic, with up to 50 trains per day traveling on two side-by-side tracks. During bridge installation, a coordinated team of more than 50 workers replaced the mainline tracks in a 24-hour work window with only intermittent closures of up to 2 hours.



The channel flows along its historical alignment. Visitors can now safely access this sandy beach year-round, and migrating and juvenile fish have a generous passage to support their life cycles.



Blueprint for Resilient Shoreline Communities

The first of its kind in Washington, the project sets a new precedent for future projects along the Puget Sound and BNSF railroad. Through careful design, our communities can activate both ecological and human relationships to the water.