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Kerry Island Estuary



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by US Army Engineer Research and Development Center



Clatskanie, Oregon, United States

Restoring habitat for a Pacific Northwest icon. Part of the Lower Columbia River estuary, Kerry Island is part of an extensive estuarine system that once produced the most Chinook salmon (*Oncorhynchus tshawytscha*) in the nation. But since the 1800s, the ecosystem has lost half of its historic habitat. Conversion of Kerry Island's estuarine floodplain to agricultural, urban, and industrial uses, including a levee installed in the 1920s, led to severe degradation. The levee disconnected the island from regular tidal fluctuations, halting the floodplain's daily inundation and causing a loss of sediment deposition, nutrient exchange, and salmon habitat. Tidally influenced landscapes such as estuaries and marshes are of critical importance to the life cycle of Pacific salmon, and restoring and expanding these habitats is a key component to salmon recovery. Therefore, in 2004, the Columbia Land Trust acquired the land; and in 2016, they removed the levee during a single tidal cycle, which required nine excavators working in tandem to remove around 8,000 cubic meters of material. The team's efforts converted 40 hectares of agricultural land to native marsh,

providing new habitat for Chinook salmon, steelhead (*O. mykiss*), and federally listed species such as coho (*O. kisutch*) and chum (*O. keta*).

Article cover: Reconnecting the tidal channels provides new estuary habitat. (Photo by Inter-Fluve)

Producing Efficiencies

To prepare for the levee's removal and the increase of water flowing through nearby channels, the project team used a two-dimensional hydraulic model to examine potential changes to hydraulic variables up- and downstream of the project. As the ground surface within the levees was approximately a meter lower than unleveed reference sites, the site would be inundated for a majority of the tidal cycle once levees were breached. Therefore, the team carefully sequenced construction, completing it on a single "breach day" during a single low tide, using a barge to remove two excavators that had worked until the tidal water encircled them.

Using Natural Processes

The team's initial site assessment evaluated land use history to understand the geomorphology, hydrology, and hydraulics of this segment of the Columbia River, documenting site-specific tidal processes and the ways fish and other wildlife used the site. They also evaluated the plant community on-site and compared it to reference sites. The thoroughness of this data collection allowed the team to reestablish this estuarine marsh plain through a sustainable progression of natural processes and cycles, creating habitat for salmon and more than 250 species of birds who use it as an important stop along the Pacific Flyway.





The revegetation of this former agricultural site increases biodiversity.

(Photo by Inter-Fluve)

Broadening Benefits

The Kerry Island restoration project contributes directly to the recovery of Pacific salmon, an important source of food and livelihood for both native tribes and communities throughout the Pacific Northwest. This project and similar restoration projects through-out the state stimulate the economy further by requiring a diverse and skilled workforce and creating a niche market for both engineering and construction services. Socially, restoration efforts unite rural communities for a common goal. Using local equipment operators has the additional benefit of engaging local residents to develop a greater understanding of restoration efforts in their own backyards.



Each high tide inundates the site, providing additional foraging opportunities for fish.
(Photo by Inter-Fluve)

Promoting Collaboration

The Kerry Island estuary restoration is the latest in a long line of Columbia Land Trust projects. Their experience working with local landowners, state and federal regulatory agencies, the region's tribal governments, and the consulting engineer helped to make this project another success. Through these longstanding relationship, the Land Trust pulled together the interdisciplinary team of water resource engineers, fish biologists, ecologists, and geomorphologists they needed to meet their short- and long-term ecological objectives. This project has promoted out-of-region collaboration, too, as communities throughout the Hudson River estuary are working to improve their own resiliency by applying approaches used at Kerry Island.



Low tide at one of the constructed tidal channels.
(Photo by Inter-Fluve)



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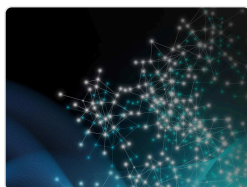
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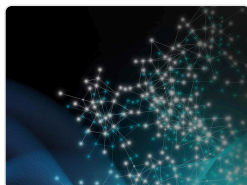
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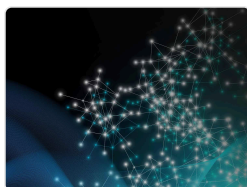
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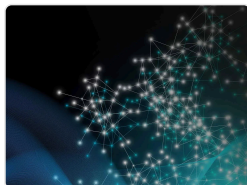
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2min pages 310, 312-313



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4min pages 306-309



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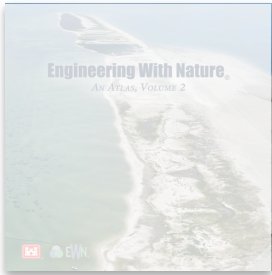


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