5 MINUTE READ

Lower Dungeness River

from **Engineering With Nature: An Atlas, Volume 3.**

by **US Army Engineer Research and Development Center**

Clallam County, Washington, United States

Restoring a floodplain by using nature-based solutions. Built in the 1960s, the old U.S. Army Corps of Engineers (USACE)–authorized Dungeness River levee created unintended consequences for river processes, flood risk, and aquatic habitat. In response to the original levee being built on the opposite bank, the river became constrained, resulting in a straighter channel, increased water velocities, an aggraded riverbed, reduced habitat for aquatic organisms, and an overall decline in the effectiveness of the levee. A partnership between Clallam County, the Jamestown S'Klallam Tribe, USACE, state and federal agencies, local nonprofits, and the surrounding community, the Lower Dungeness Floodplain Restoration Project sought to remove part of the old levee, build a setback levee, and relocate a road bisecting the floodplain. As envisioned in the late 1990s by the Dungeness River Management Team, a local watershed council, the restoration project took many years to come to fruition. Necessary funds were awarded through grants. Construction occurred in 2021 and 2022. The project reconnects the lower Dungeness River to 71 hectares of historical channels and floodplain, helping restore

habitat processes along one of the most important river systems on the Olympic Peninsula in Washington State. The project reduces flood risk and benefits over 100 fish and bird species, including four species of endangered salmon. For its naturebased approach, the project has received awards from the North Olympic Land Trust, Floodplains by Design, American Council of Engineering Consultants, and American Society of Engineers.

Article Cover and above: Aerial view of project-engineered logjam natural and nature-based features during flooding in December 2022.

(Photo by John Gussman)

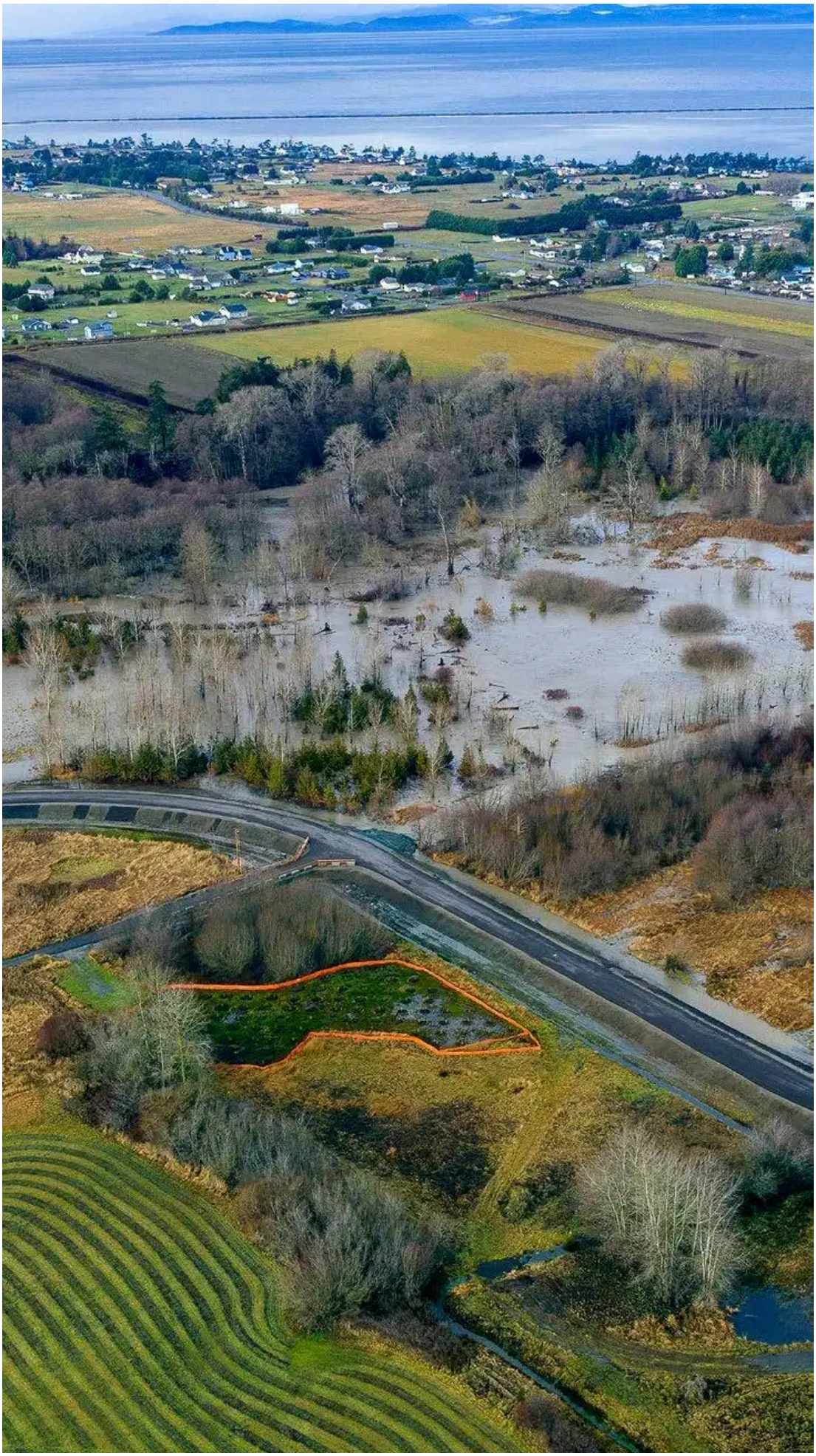
Producing Efficiencies

The project addressed high sedimentation rates impacting levee reliability and flood risk by giving the river access to the floodplain. This spreads out the area for deposition and increases conveyance, reducing flood elevations and risks. Nature-based solutions used included levee setbacks

to naturally restore the floodplain by letting the river create new side channels and wetlands (that increase storage of fine sediment, nutrients, and carbon), hard infrastructure (road) relocation, and additions of large wood and engineered logjams to manage the rates of bank erosion and floodplain reoccupation by the river. The setback levee also reused portions of the existing levee, reducing the need to import levee fill material and saving on cost.

Using Natural Processes

Providing access to the historical channels and floodplain by removing the old levee and relocating the road has resulted in increased use of the site by fish and wildlife species known to use the river corridor for spawning, nesting, rearing, and migration. Redistribution of water and other materials such as wood and sediment has increased habitat availability and quality by reducing flood velocities during high flows and storing water during low flows, as well as redistributing sediment over a much wider floodplain. River flooding and vegetation recruitment enabled by the project naturally restore existing channels and the reconnected floodplain.



Panorama of the Dungeness River delta and Lower Dungeness River Floodplain Restoration project.

(Photo by John Gussman)

Broadening Benefits

The new levee and restored site are a focal area for recreational activity, including hiking, biking, dog walking, and bird-watching, increasing community involvement and buy-in. The upstream portion of the setback project was enabled by acquiring 26 hectares of floodplain that had been converted to agricultural use. The tribe committed to purchasing agricultural easements on 52 hectares (2:1 ratio) within the area to help provide stability for agricultural producers and offset any perceived impact of restoring the floodplain. The project is expected to improve the Dungeness chinook salmon (*Oncorhynchus tshawytscha*) escapement, likely translating to increased fishing opportunity in marine waters downstream.

Aerial view of Dungeness River and delta, including federal levee (right bank), private levee (left bank), and project area prior to levee setbacks.

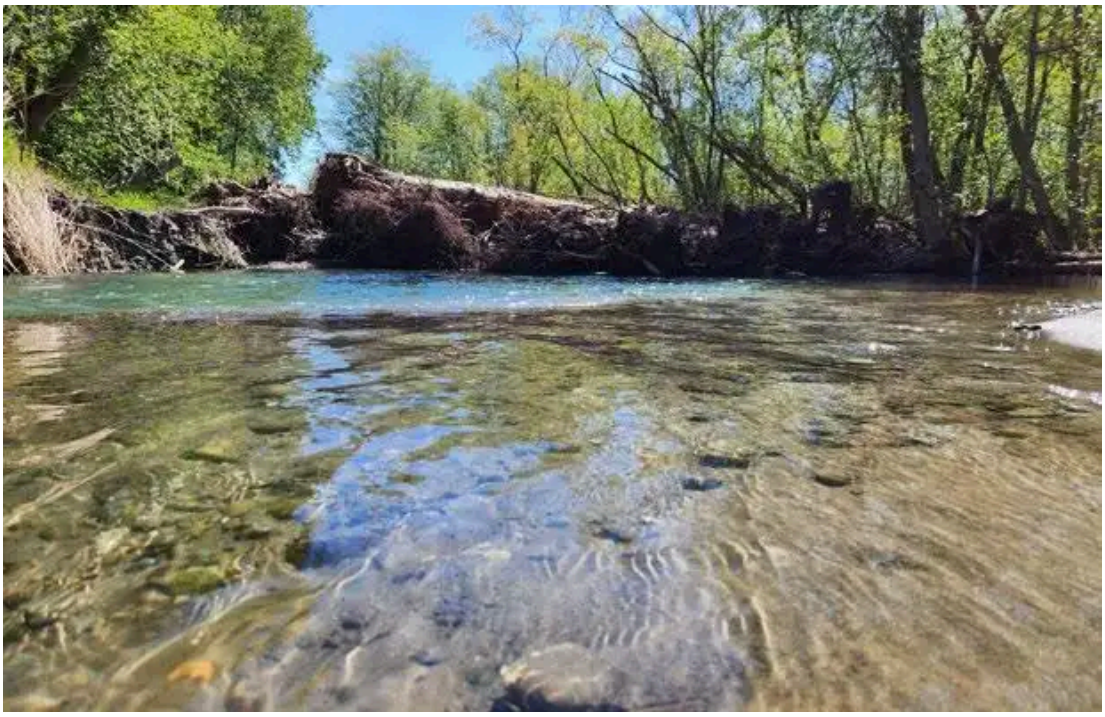
(Photo by Jamestown S'Klallam Tribe)

The channel flowing across the footprint of the old levee upstream of the first engineered logjam complex.

(Photo by Randy Johnson)

Promoting Collaboration

The project required ongoing collaboration between partners, interested groups, and the community. Multiparty meetings were held regularly during the engineering, design, and permitting phases. Monthly meetings of the Dungeness River Management Team offered a forum for regular updates and emerging topics. Subject-specific public meetings were held to gather community input to the project. Informal oneon-one conversations between project partners often occurred and played an important role in a small community. When a specific topic required further investigation, a technical work group convened to study and offer recommendations to the larger group.



Scour pool located at the engineered logjam complex in May, showing the value of engineered logjams to create deep and extensive pools for fish, especially during years of drought.

(Photo by Gus Kays)

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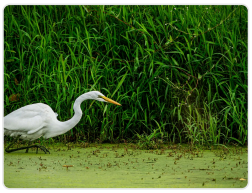

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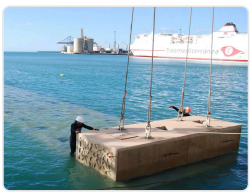

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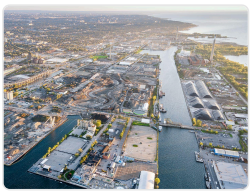

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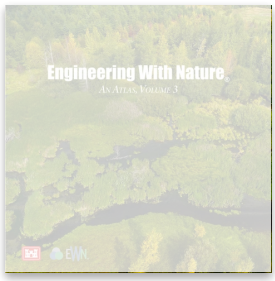

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