Southern Flow Corridor

Tillamook, Oregon

2017 Region 10 Winner

Key Project Lesson:

Diverse goals can be achieved through shared outcomes supported by non-traditional brownfields redevelopment

Overview

Tillamook County's Southern Flow Corridor Project speaks strongly to the will, perseverance, and creativity of a rural community to build resiliency back into its environment. Borne from the critical need to mitigate flooding in the City of Tillamook, the project restored 520 acres of tidal wetlands creating one of the largest wetland restoration areas in the northwest, but also addressed the commercial, residential, and agricultural concerns and needs of the region. The positive economic and social effects the project has on flood damage reduction cannot be overstated in a community ravaged by flooding in recent years. The successful collaboration of more than 100 federal, state, and local partners is estimated to yield substantial ecological and socio-economic benefits. Brownfield redevelopment funding solely supported 10 acres of remediation on the 690-acre project.

Featured Partners

- Anderson Geological
- City of Tillamook
- Federal Emergency Management Agency
- NOAA Fisheries
- Northwest Hydraulic Consultants
- Oregon Business Development Dept.
- Oregon State Lottery
- Oregon Watershed Enhancement Board
- Port of Tillamook Bay
- State Senator Betsy Johnson
- Tillamook Bay Flood Improvement District
- Tillamook County
- Tillamook County Farm Bureau
- Tillamook Estuaries Partnership
- Thompson Bros. Excavating
- US Fish and Wildlife Service

Primary Reason for Redevelopment

Major flooding in February 1996 caused $53 million in damages within Tillamook County, the highest per capita loss in the history of Oregon and equivalent to 148% of the County's annual budget. Subsequent large floods occurred in 1998 and 1999, and most recently in 2006 and 2007, causing further damage. Following the 2007 flood, Oregon Governor Ted Kulongoski designated addressing Tillamook flooding issues as an 'Oregon Solutions' project. Under a community governance model, Oregon Solutions brings together federal, state, and local government agencies with community leaders to seek collaborative solutions. Over the next six years, the Oregon Solutions team collaborated on the consideration of ecosystem restoration alternatives that provided flood damage

reduction benefits in the upper Tillamook Bay floodplain, which included the City of Tillamook and U.S. Highway 101 business corridor. After substantial hydraulic modeling, the team decided to pursue the project since it provided the largest benefits in flood damage reduction. The County purchased five private properties to accomplish the 690-acre project. One of the properties was a former veneer mill site and was known to have legacy hazardous substance and petroleum product contamination at levels above ecological receptor standards. The County's purchase of the old mill site property was identified as critical to ensure ecological health and flood reduction goals.

Approach

The project evolved over two decades, in response to increasing economic and ecological impact of flooding to a community dependent largely on agriculture and wood products processing, and concluded in December 2017. The project provides flood level reduction benefits through the removal of man-made impediments to flood flow and permanently restores and protects tidal wetlands at the confluence of the Wilson, Trask, and Tillamook rivers in the upper Tillamook Bay.

- Land Acquisitions 150 ac
- Levee Removal 7 mi
- Levee Lowering 2.8 mi
- New Setback Levee 1.5 mi
- Tide gate Removals 15
- New Floodgates 9
- Contamination Removal 12,600 cy
- Ditches Filled 4.6 mi
- Rip Rap Removal 2,025 ft
- Tidal Channel Construction 5.5 mi
- Tidal Channel Restoration 14 mi
- Tidal Wetland Restoration 520 ac

A memorandum of agreement established the roles and responsibilities of a four-entity project management team. Diverse sources of funding from 11 entities financed the $11.3 million project, including nearly $800,000 in brownfields redevelopment funds. Soils and rubbish contaminated with substances hazardous to ecological receptors were removed from the 10-acre old mill site and hauled off-site or placed in the 1.5-acre on-site disposal cell. The cell, which includes a passive methane venting system and a two foot cap of clean topsoil, was finished with a parking lot. The remedial activities restore the path of floodwater draining to the Bay and provide for resident and tourist parking and public access.

Innovative Techniques

Land Conservation: A conservation easement permanently protects the restored tidal wetland habitats and ecological functions.

Ecological Benefits: The project area lies within the migration pathway of juvenile salmon that migrate from the Wilson, Trask, and Tillamook rivers. The Oregon Department of Fish and Wildlife estimates that the 520 acres of restored wetlands will produce annually 6,000-14,000 adult coho.

Economic and Sustainable Benefits: Modeling predicts water level reductions of up to 1.5 feet for all floods. The reduction area is over 3,000 acres in the upper Tillamook Bay floodplain and benefits 540 structures. The estimated economic benefit accrued from avoided flood damages over a 50-year project life is $9.2 million. Spending on outdoor recreation and sport fishing is vital to, and provides sustainable revenue for, local economies. Expanded public use opportunities, including the City's plans to connect a hiking trail from the old mill site to the Hoquarten Interpretive Trail, will generate millions of additional revenues. Sport fishing alone is estimated to generate $4.67 million.

Challenges

A significant volume of contaminated soil and fill material was present on the 10-acre old mill site. Remediation involved the excavation and removal of 12,600 cubic yards of contaminated soil, concrete, asbestos-containing demolition debris, and other fill material from the former mill site and a discovered dump site. Areas where the residual contaminated soils exceeded ecological screening

levels were capped with topsoil and ten elevated tree berms, creating a barrier that reduced human and ecological contact with contaminants and providing the community with an attractive recreation area, including hiking trails and a parking lot.

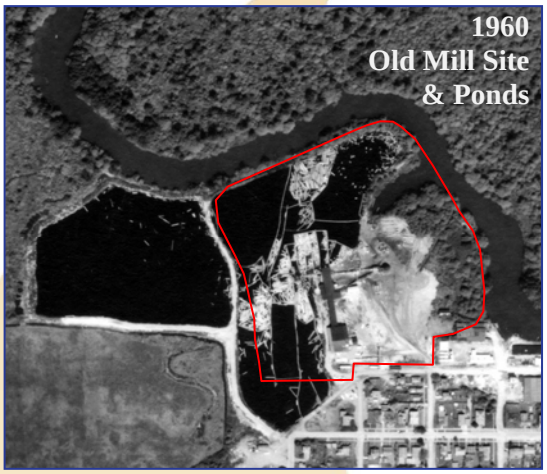
The large volume of contaminated material posed a challenge regarding its disposal or re-use. The concentrations of contaminants exceeded the criteria for clean fill, significantly limiting the options for re-use of the material off site. The cost to haul and dispose of contaminated material to a suitable landfill was prohibitively expensive. In lieu of landfill disposal, 11,500 cubic yards of contaminated material was placed in an onsite engineered containment cell. Use of the onsite cell saved the project approximately 575 landfill trips (76,000 truck miles). Approximately 1,100 cubic yards of other material that could not be disposed of in the containment cell was landfilled.

Benefits

Working with a diverse set of partners, Tillamook County has restored and permanently protected 520 acres (10%) of the watershed's historic tidal wetland habitats at the confluence of Tillamook Bay's two most productive salmon systems, the Wilson and Trask rivers. The long-term ecological and socio-economic outcomes include:

- Reduced flooding in the U.S. Highway 101 business corridor and adjacent lands;
- Improved freshwater and estuarine water quality;
- Increased habitat complexity and availability across the range of tidal wetland habitats; and
- Enhanced ecological function benefitting other aquatic, terrestrial, and avian species.

Before



After

Project Address:	Tillamook, Oregon
Contact Person:	Rachel Hagerty, Chief of Staff, Tillamook County
Phone:	503-842-3404
Email Address:	rhagerty@co.tillamook.or.us
Names of Participants:	Tillamook County, Port of Tillamook Bay, City of Tillamook, Tillamook Estuaries Partnership, Tillamook Bay Flood Improvement District
Number of Acres:	Project Area = 690 acres; Remediation Area = 10 acres
Former Uses:	Log-peeling veneer mills
Current Uses:	Natural ecosystem, public access
Former number/Types of Jobs:	Unknown, mills operated from 1920s until 1965
New number/Types of Jobs:	Not applicable, property restored to natural habitats
Type of Site:	Former mill site restored to natural habitats
Regulatory Program:	State Voluntary Cleanup Program, USEPA Oregon DEQ
List of Major Contaminants:	Heavy oil, metals, asbestos, polycyclic aromatic hydrocarbons
Magnitude of Contamination:	12,600 cubic yards of contaminated soil/rubbish over 3.5 acres
Greatest Challenge:	Cost-effective management of contaminated material
Length of Time to Remediate Site:	4 years and 3 months
Primary Reason for Redevelopment:	Habitat restoration and flood mitigation
Years Abandoned or Challenged:	52 years
Cleaned up under Consent Decree:	Yes, outcome of Prospective Purchaser's Agreement
List of Financial Assistance:	$3,225,000 FEMA $2,700,000 NOAA $1,522,144 Oregon Watershed Enhancement Board $1,075,000 Oregon State Lottery $816,019 US FWS $795,647 Oregon Business Development Department $500,000 Oregon Governor's Regional Solutions $300,000 National Fish and Wildlife Foundation $119,917 Tillamook County $33,430 City of Tillamook $8,000 Tillamook Bay Flood Improvement District
New Tax Revenues:	Not applicable (revenues will be realized through reduced impacts on businesses and reduced flood insurance rates)
Community Outreach Activities:	Website, video, school groups, tours, press, signage
Innovative Remediation Techniques:	On-site disposal cell design, tree berm design
Innovative Economic Development:	Recreation / open space
Land Conservation:	Property included in 504-acre conservation easement
Sustainable Development:	Flood mitigation and expanded outdoor recreation
Federal Partners:	FEMA, US FWS, NOAA Fisheries