

Coast Dam Removal Projects
"Reverse Engineering"
West Coast Dam Removal Projects
Environmental Aspects of West
Coast Dam Removal Projects
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"REVERSE ENGINEERING;" Environmental Aspects of West Coast Dam Removal Projects

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Tetra Tech, Inc.

Acknowledgements

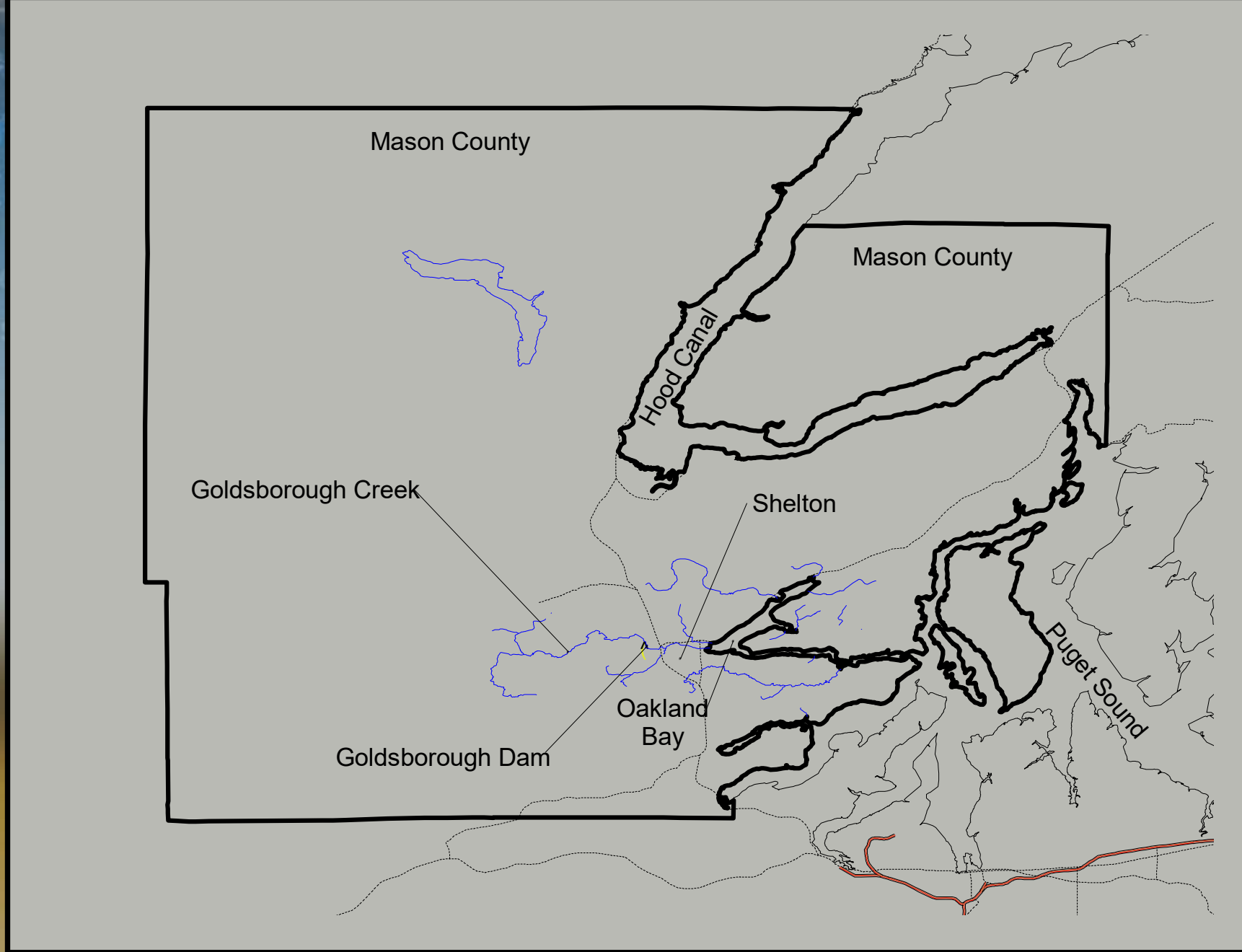
- **Seattle District, U.S. Army Corps of Engineers**
- **Portland District, U.S. Army Corps of Engineers**
- **Los Angeles District, U.S. Army Corps of Engineers**
- **Simpson Timber Co. & Washington Department of Fish & Wildlife**
- **City of Springfield, Oregon**
- **Ventura County, California**

Dam Removal Case Studies

- **Goldsborough Dam, Washington**
- **Springfield Millrace Dam, Oregon**
- **Matilija Dam, California**

Projects in Different Stages

- **Construction Phase of Goldsborough Dam**
- **Feasibility Study for Springfield Millrace**
- **Reconnaissance Study for Matilija Dam**



Goldsborough Dam

Goldsborough Dam Background

- **35 foot (11 m) timber pile, concrete and sheet pile dam**
- **Original purposes: water supply and hydroelectric power**
- **Entirely filled with sediment, does not provide either purpose**
- **Blocks all fish passage upstream**

Goldsborough Dam Removal Objectives

- **Fish passage upstream to 12 miles (20 km) of habitat**
- **Restoration not mitigation**
- **Need to protect structures downstream**

Goldsborough Dam Key Issues

- **Large volume of sediment behind dam**
- **Downstream channel could not convey the sediment (fish habitat and flooding)**
- **Chum salmon primary species to consider (threatened species); poor jumping capability**
- **Structures downstream that needed protection**

Goldsborough Dam Design Features

- **Leave much of the sediment in place**
- **Engineered step-pool stream channel**
- **Compromise between hard bank protection and bio-engineering**
- **Planting plan**
- **Other fish habitat features**

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Goldsborough Dam, 1999



Goldsborough Dam, 1999

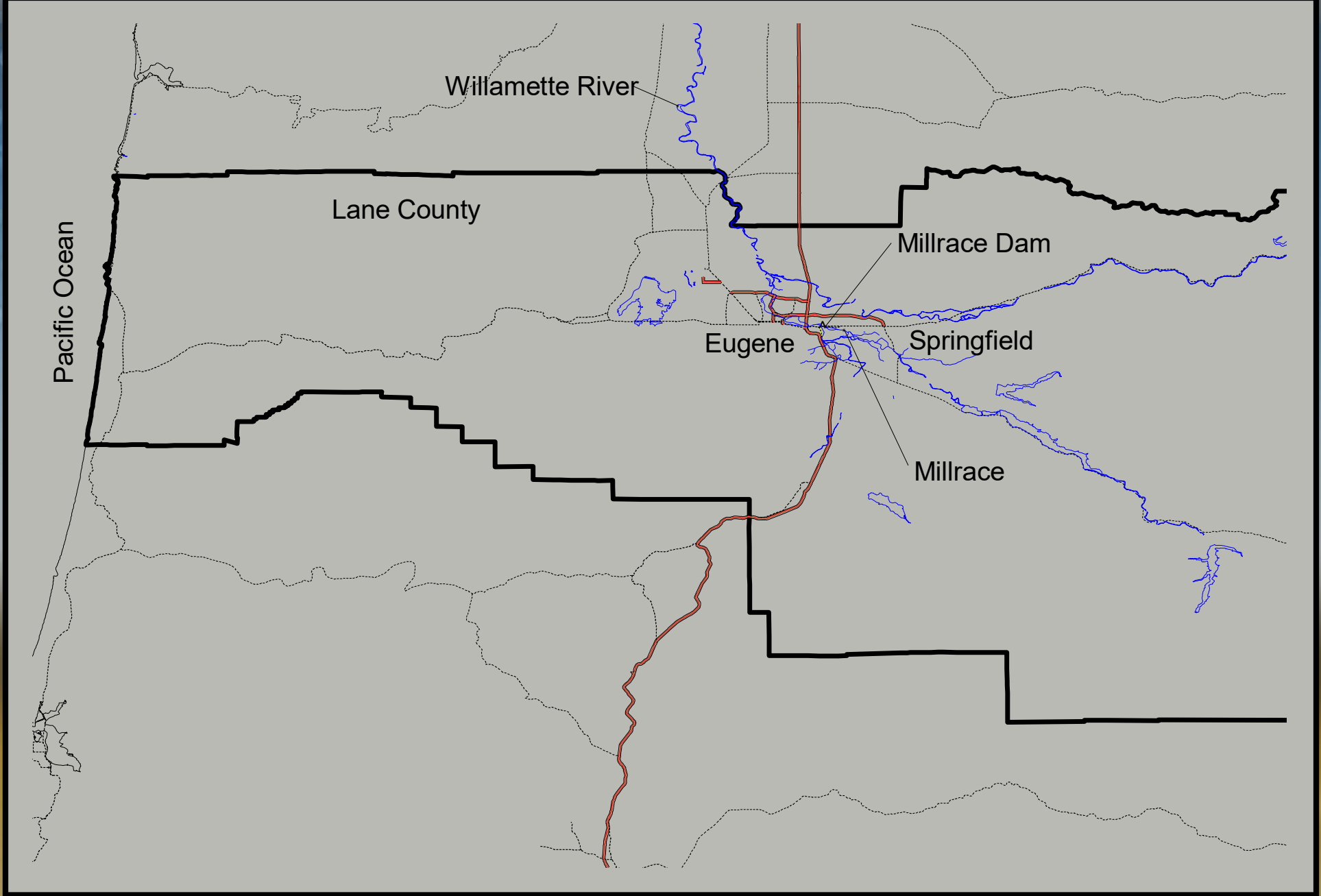
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Goldsborough Dam, 2001



Goldsborough Creek, 2001



Springfield Millrace Dam

Springfield Millrace Background

- **Water supply diversion channel off of Middle Fork Willamette River with 15 foot (4.5 m) dam**
- **Currently supplies two major users: Water Utility well field and lumber mill emergency water**
- **Blocks all upstream fish passage**
- **Very poor water quality in pond**

Springfield Millrace Dam Removal Objectives

- **Fish passage to side-channel habitat**
- **Improve water quality (currently lethal to salmon)**
- **Restore aquatic and riparian habitats for a diversity of species**

Springfield Millrace Key Issues

- **Restoration not mitigation**
- **Need to significantly improve water quality to provide acceptable salmon habitat**
- **Exotic species dominate riparian and aquatic communities**
- **Concerns about contaminated sediments during pond drawdown**
- **Need to maintain water supplies**

Springfield Millrace Design Features

- **Divert water completely around Millpond during construction**
- **Reduce additional high spots upstream of dam to eliminate backwater**
- **Provide seasonally flooded wetland habitats to reduce non-native species**
- **Construct alternate water supply facility for one user of pond**

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Springfield Millrace Dam

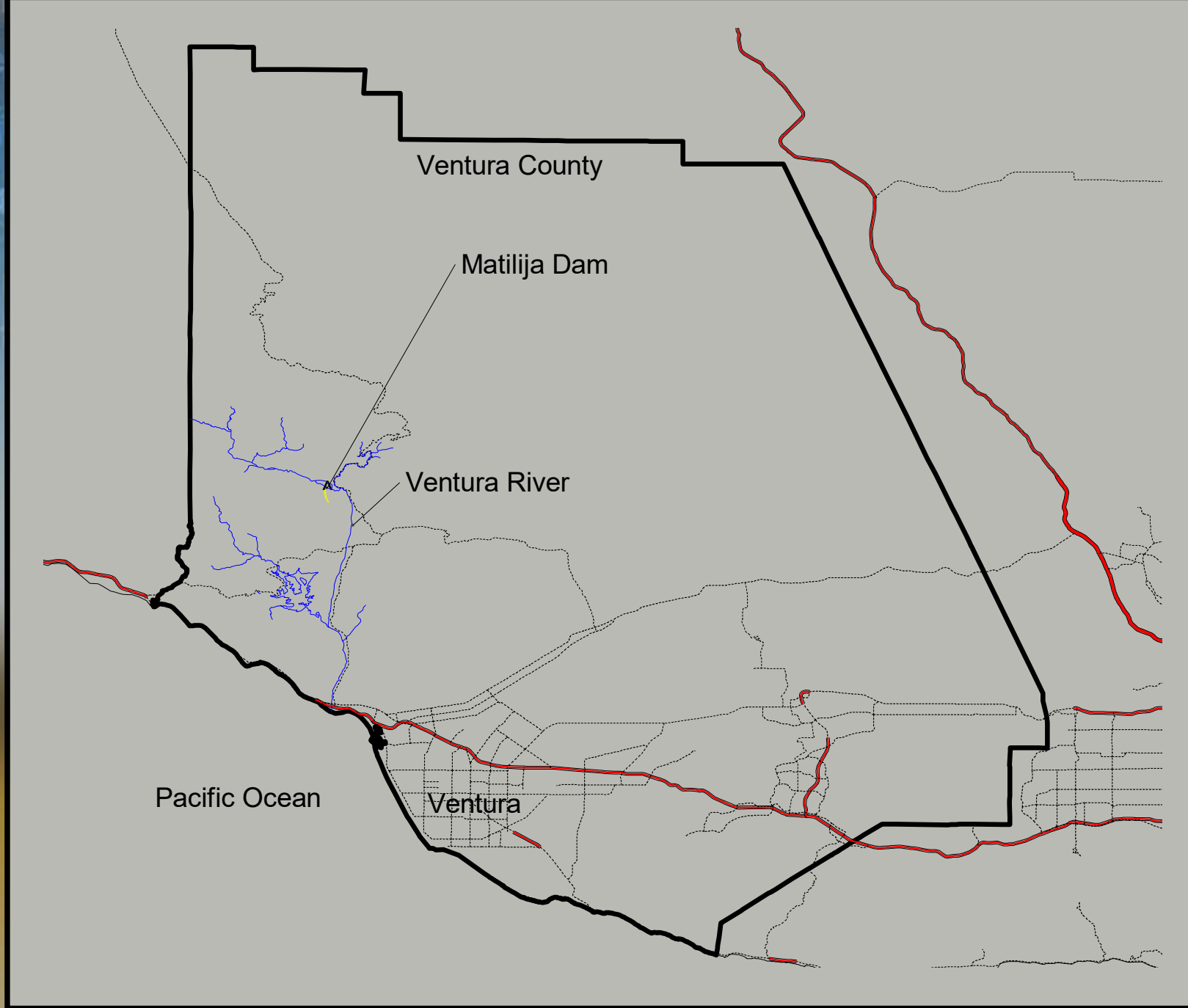
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Springfield Millrace Dam



Springfield Millrace



Matilija Dam

Matilija Dam Background

- **160 foot (48 m) concrete arch dam constructed in 1947 (originally 190 feet)**
- **Built despite concerns about rapid sedimentation**
- **Purposes of flood control and water supply**
- **Currently filled in with sediment**
- **Blocks fish passage to best steelhead spawning habitat in watershed**

Matilija Dam Removal Objectives

- **Steelhead passage to upstream habitat**
- **Restore sediment transport processes and supply to beaches**
- **Eliminate safety hazard (dam is in poor shape)**

Matilija Dam Key Issues

- **Huge volume of sediment behind the dam (> 6 million CY)**
- **If transported naturally through river system might destroy limited remaining steelhead habitat**
- **Environmental effects from hauling sediment away**
- **Existing wetland habitat at reservoir**



Matilija Dam

Summary

- **When purpose is restoration the project should be designed to not require any compensatory mitigation**
- **This may necessitate stringent construction requirements and an unusual design**
- **Sediment is a major concern on systems with salmon species**