Gold Ray Dam Removal

Removal of the Last Fish Barrier on the Lower Rogue River

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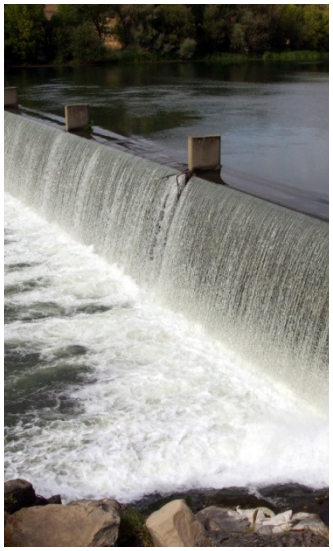
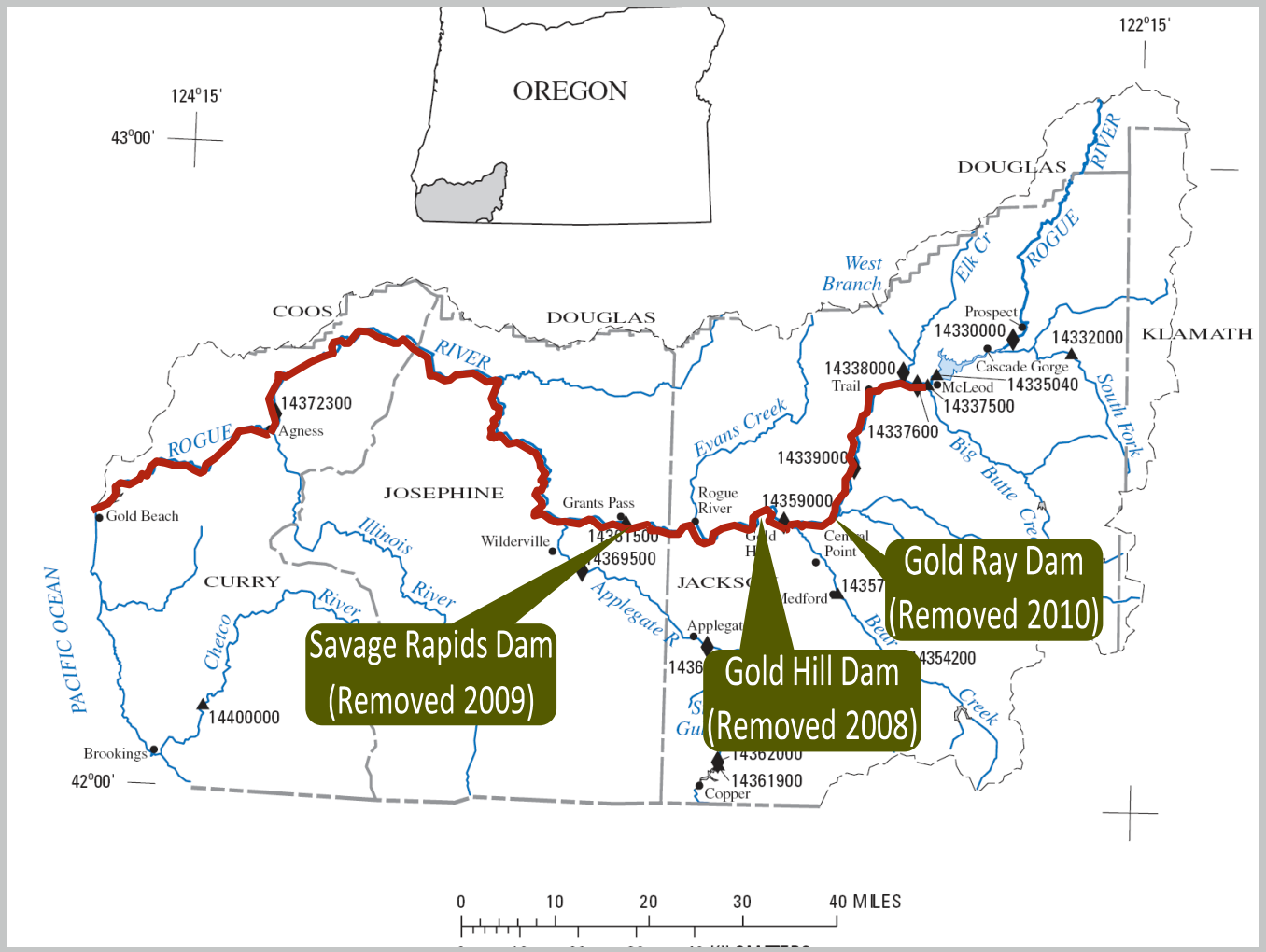


Project Overview

Gold Ray Dam,
Jackson Co., OR

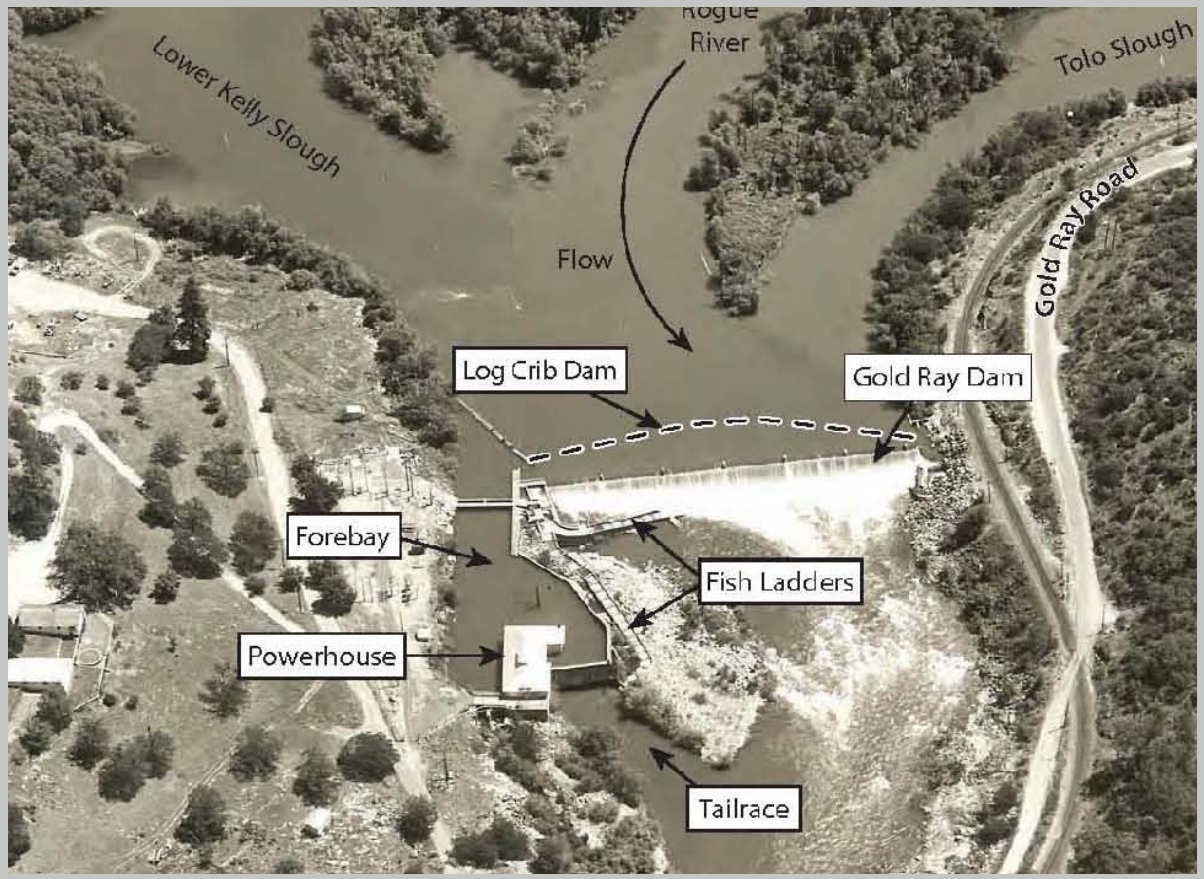


Gold Ray Dam,
Jackson Co., OR

Project History

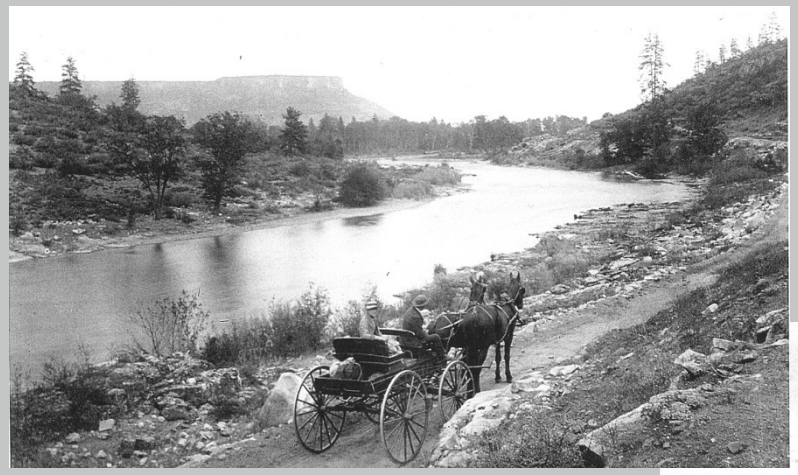
Project History

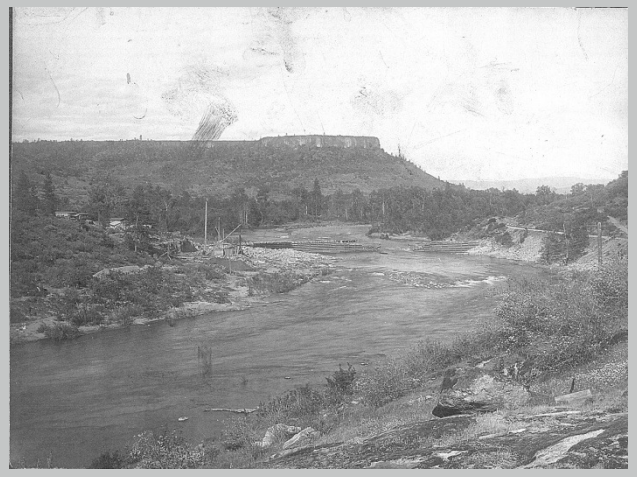
- Located in Jackson County on the Rogue River
- Log crib dam built in 1903
- Concrete dam built in 1941
- During construction found a third unknown concrete dam

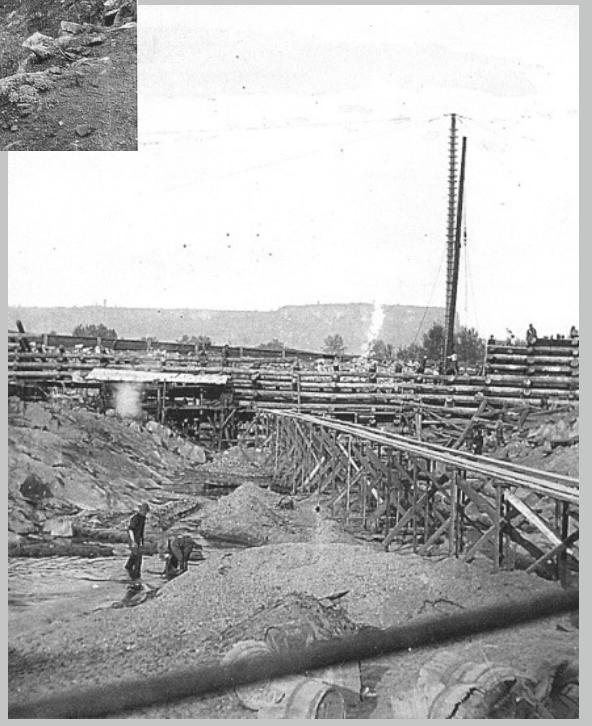


Project History

- Donated to Jackson County by Pacific Power in 1972
- County planned recreational use at the site but it never occurred
- ODFW operates fish ladders and counting station







Project Goal

Project Goal

Purpose and need for action

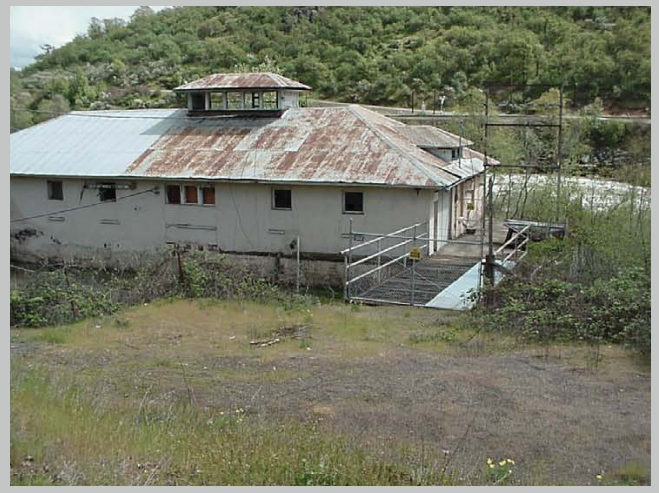
- Improve inadequate fish passage
  - Rogue River contains ESA listed Coho salmon
  - Dam obstructs fish passage
  - 5th highest priority on ODFW fish passage list
  - Fish ladders do not meet design standards
- Remove safety risks and maintenance costs
- Improve structural stability

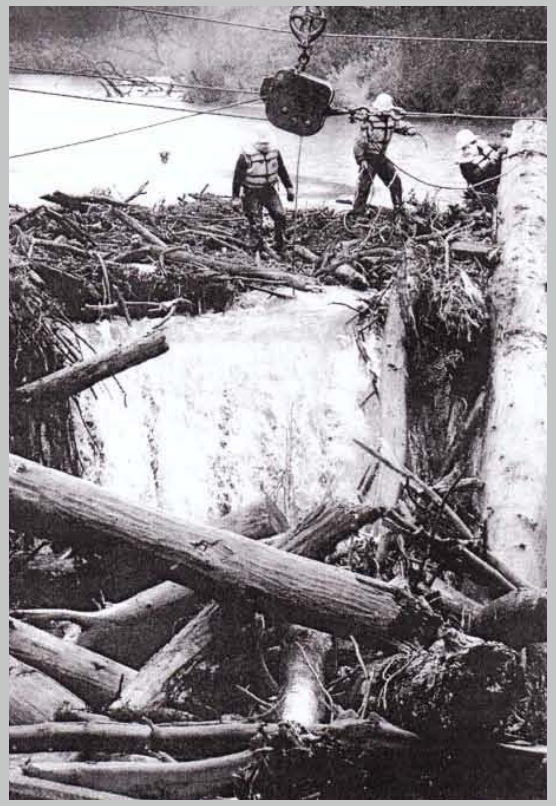
Simply—Habitat, Cost and Liability

HDR

Why Remove the Dam?

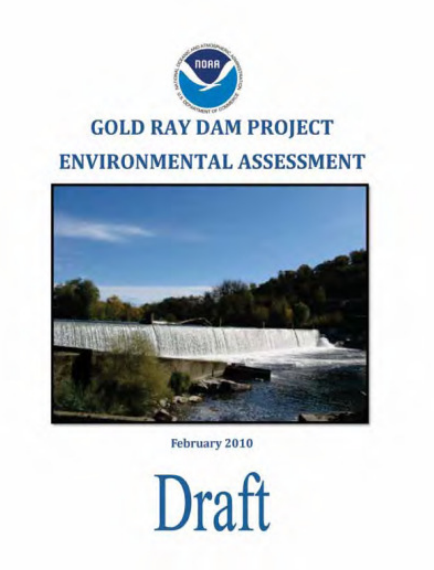
- The powerhouse and dam structure were deteriorating
- Vandalism and security concerns
- Fish ladder didn't meet NMFS standards
- Drift removal and log jams





Steps to Removal

- In fall 2009, County received $5M grant from NMFS (must be obligated spent by October 31, 2010)
- County must complete NEPA and permitting to release funds
- County hired a design build firm – Slayden Construction. The team included River Design Group and HDR
- HDR's role
  - NEPA Environmental Assessment
  - Federal, state, and local permits
  - Sediment transport analysis
  - Floodplain analysis



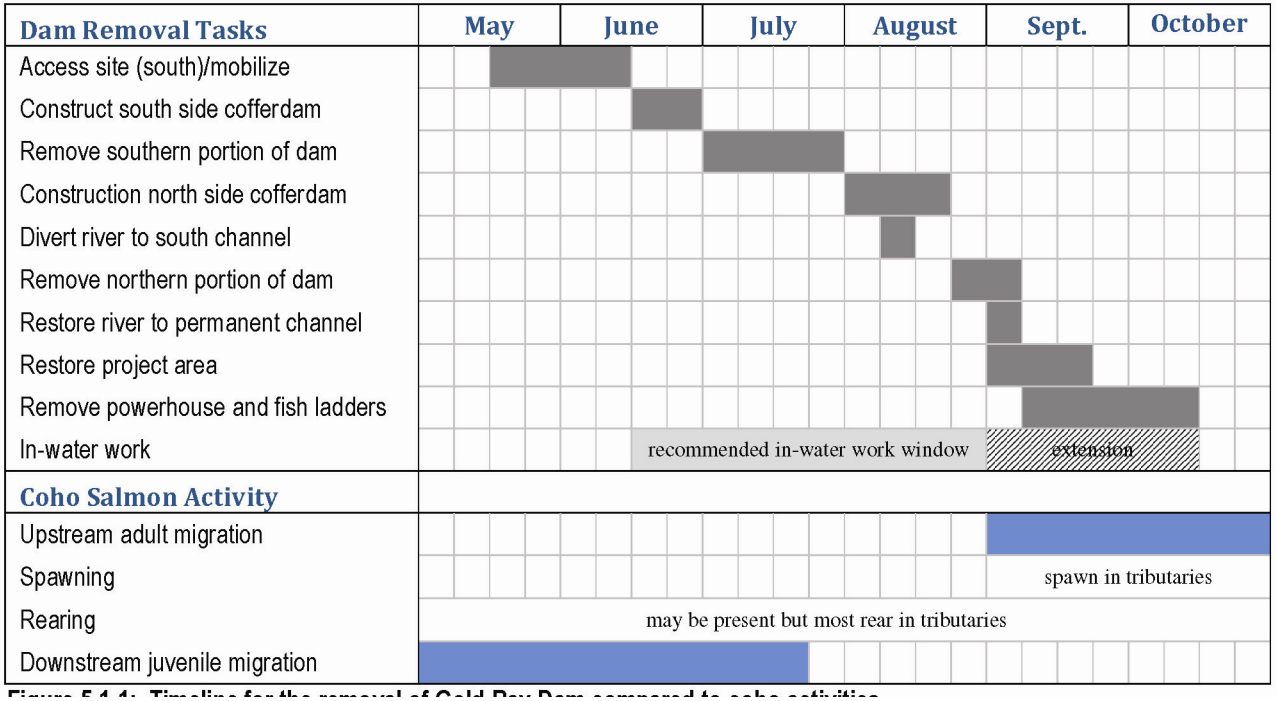
Condensed Project Schedule

- Eight months to
  - Complete all analysis
  - Complete NEPA
  - Obtain all permits:
    - Clean Water Act Section 404/401
    - ESA Section 7 Consultation
    - NHPA Section 106 MOA
    - NPDES Construction Stormwater Permit
    - State Removal-Fill Permit
    - Jackson County Floodplain Permit
  - In-water work window of June 15-Sept 1
  - Translated: All analysis and draft documents completed in 3 months
- Monthly meetings with Interagency Review Team met monthly
    - USACE
    - ODFW
    - ODEQ
    - ODSL
    - NMFS
    - Jackson County

Key Issues for Jackson County

During NEPA process, Jackson County wanted to:

- Explore dam rehabilitation
- Assess sediment and floodplains downstream impacts
- Condensed project schedule



Explore Dam Rehabilitation

- Rehabilitation options
  - Dam rehabilitation (structural upgrades only)
  - Dam rehabilitation with hydroelectric power
- No water rights to generate power
- Cost Summary
  - Dam Removal - $5.6M
  - Dam Rehabilitation - $15.9M
  - Dam Rehabilitation with hydroelectric power - $69.7M

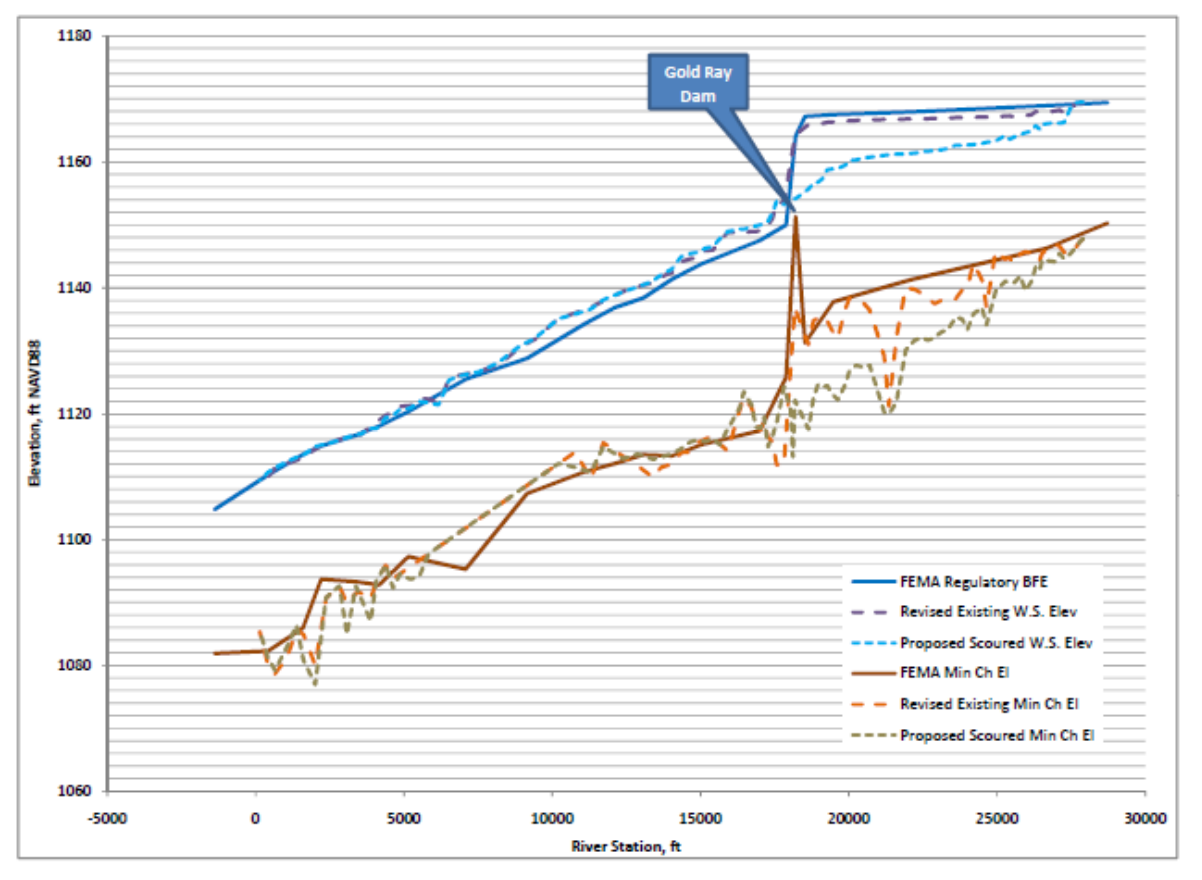
Environmental Considerations

Hydraulic and Sediment Modeling

- Sediment sampling behind dam indicated no contaminants of concern present
- Investigated several alternatives for sediment management per BOR
  - No Action Alternative
  - River Erosion Alternative
  - Mechanical Removal Alternative
  - Sediment Stabilization Alternative
- Due to clean sediment and cost constraints, River Erosion was selected for sediment management

Hydraulic and Sediment Modeling

- Hydraulic and Sediment Analysis HEC-RAS modeling
- Hydraulic Analysis Results
  - Water level behind the dam estimated to drop up to 22 feet
  - Sediments behind the dam would be transported downstream
  - Minor long-term deposition downstream

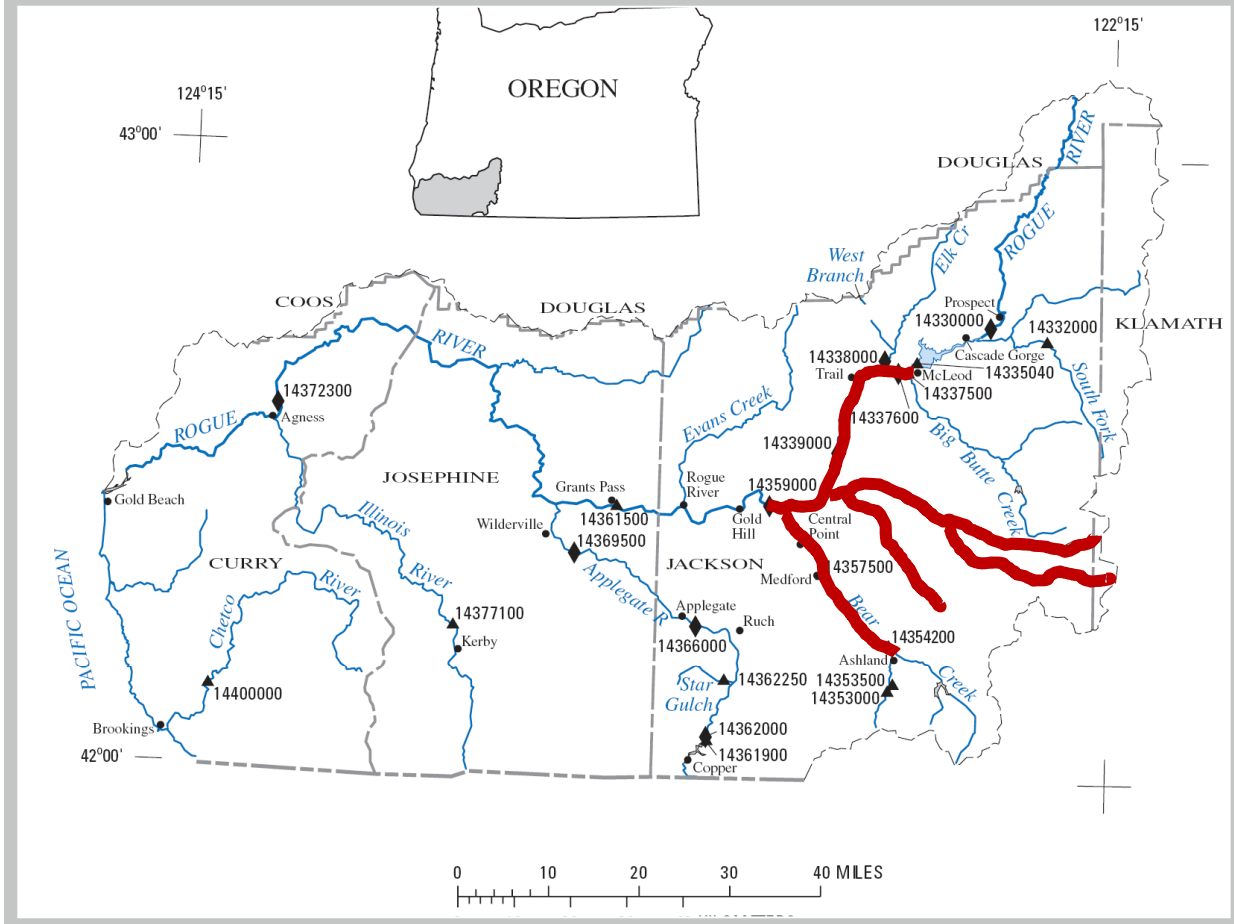


Wetland Impacts

- Wetland Complex had evolved following construction of the dam.
- Proposed removal would impact wetlands upstream of dam
- Analysis showed that wetlands would reform along the fringes
- No loss of function anticipated
- No mitigation required

Fish Passage

- Dam identified by ODFW as one of the worst impediments in Oregon
- Contained the last fish counting station on the Rogue River
- Removal of the dam would create 157 miles of habitat
- Fish passage retained during construction



Ecosystem Restoration

- Lowering of water level could increase potential for head cuts
- Bear Creek confluence anticipated 5 to 7 foot drop
- Included several riffle structures and large woody debris to prevent headcut migration

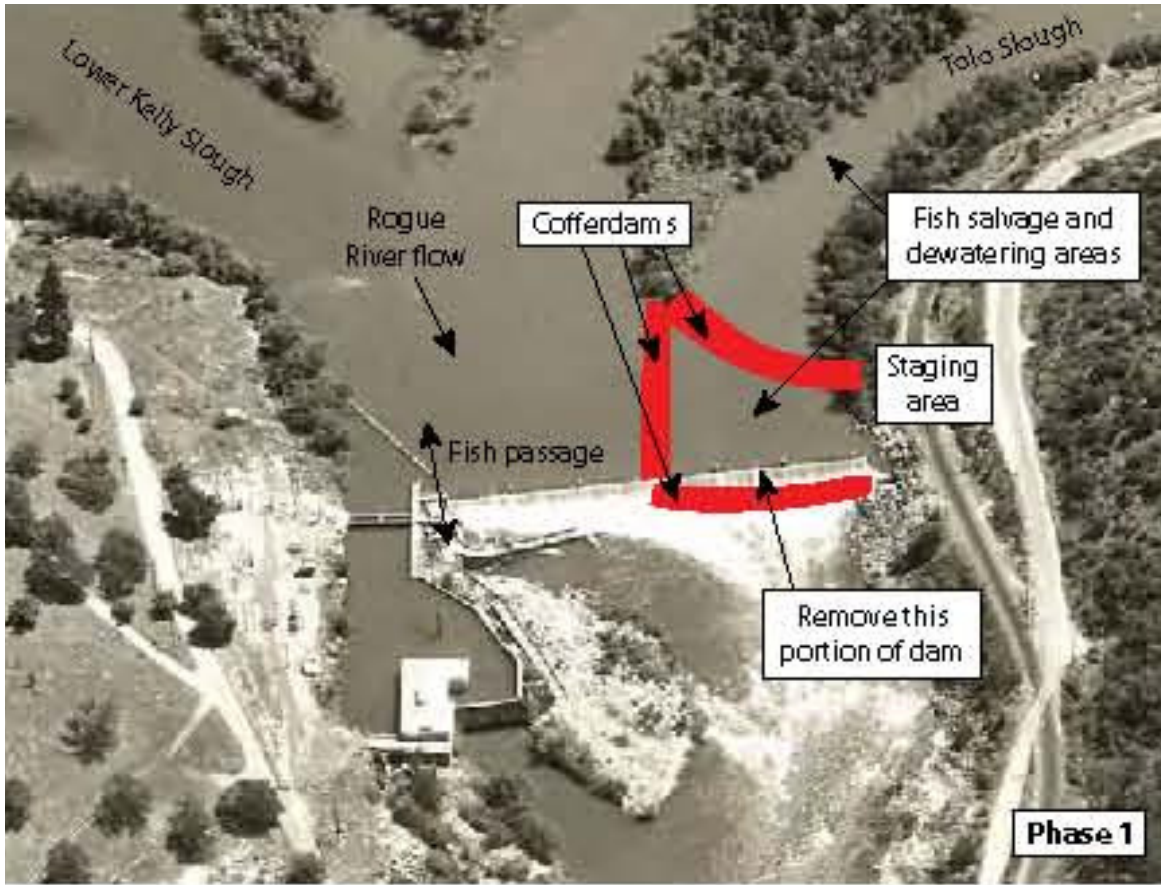
Project (De)Construction

Optional Message Placement

Dam Removal

Two-phase Removal of Dam

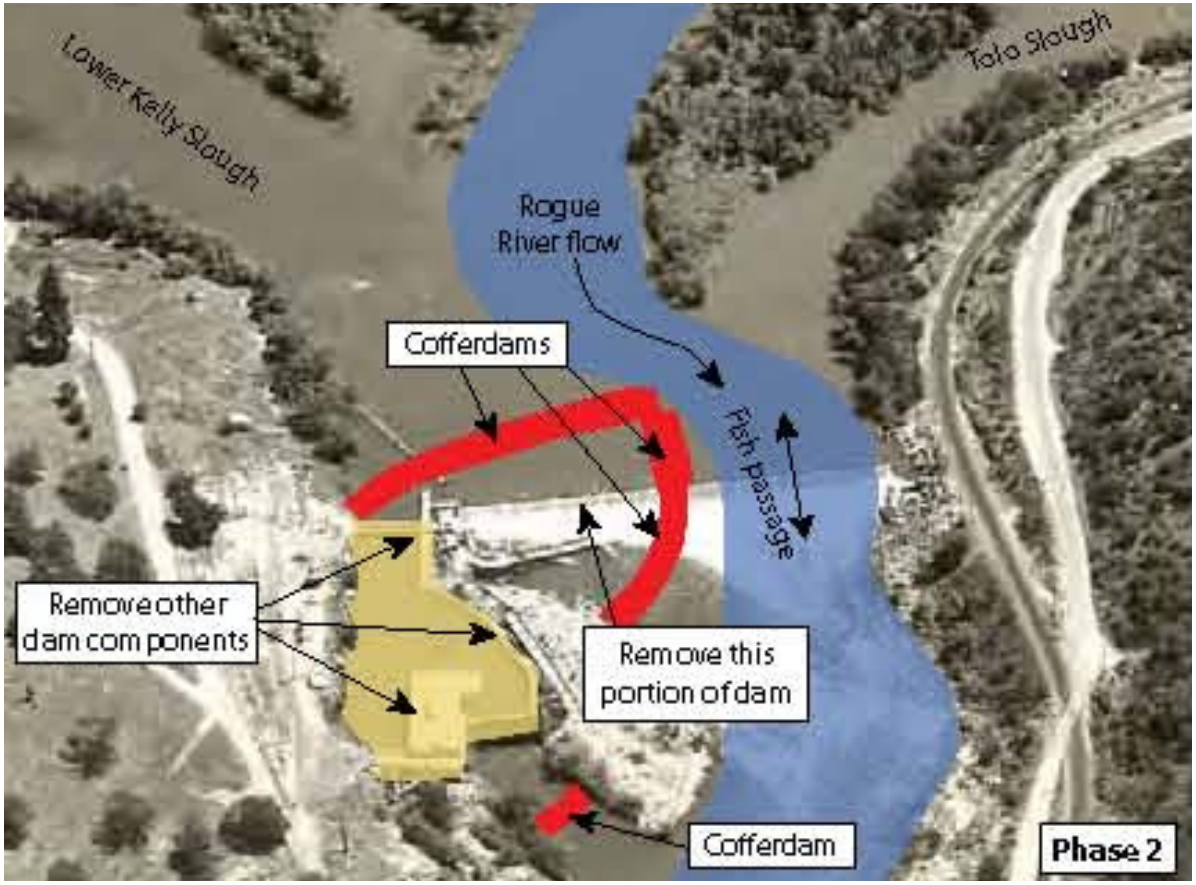
1. Isolate and remove southern portion



Dam Removal

Two-phase Removal of Dam

2. Isolate and remove northern portion and other components (powerhouse, etc.)



Construction

- Started June 15, 2010
  - Two appeals that stopped work

Construction

- Resumed construction in mid July 2010

Construction

- Removal completed September 16, 2010

Project Summary

- Improved fish passage by removing fish barrier
- Addressed environmental concerns through collaboration
- Met aggressive project schedule

Project Acknowledgments

- Client – Jackson County Oregon
  - Project Manager John Vial
- Project Delivery Team
  - Slayden Construction – Darren Funk, PE
  - River Design Group – Scott Wright, PE
  - HDR – Permitting, Sediment and Hydraulic Analysis
    - James Gregory – Project Manager
    - Leandra Cleveland – NEPA/Permitting Lead
    - Brian Doeing – Hydraulics/Sediment Management Lead

Questions

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http://www.rvcog.org/mn.asp?pg=NR_Gold_Ray_Dam
http://www.earthcam.com/clients/noaa/rogueriver/