

NRCS Watershed Rehabilitation: Studies on PL-566 Dams in Oregon

Presented by: Meghan Walter, P.E.

State Hydraulic Engineer

Natural Resources Conservation Service - Oregon

U.S. Department of Agriculture

Meghan.Walter@or.usda.gov

(503) 414-3063

Oregon PL-566 Project Sponsors

Sutherlin Water Control District

Middle Fork Irrigation District

Town of Lakeview, Oregon

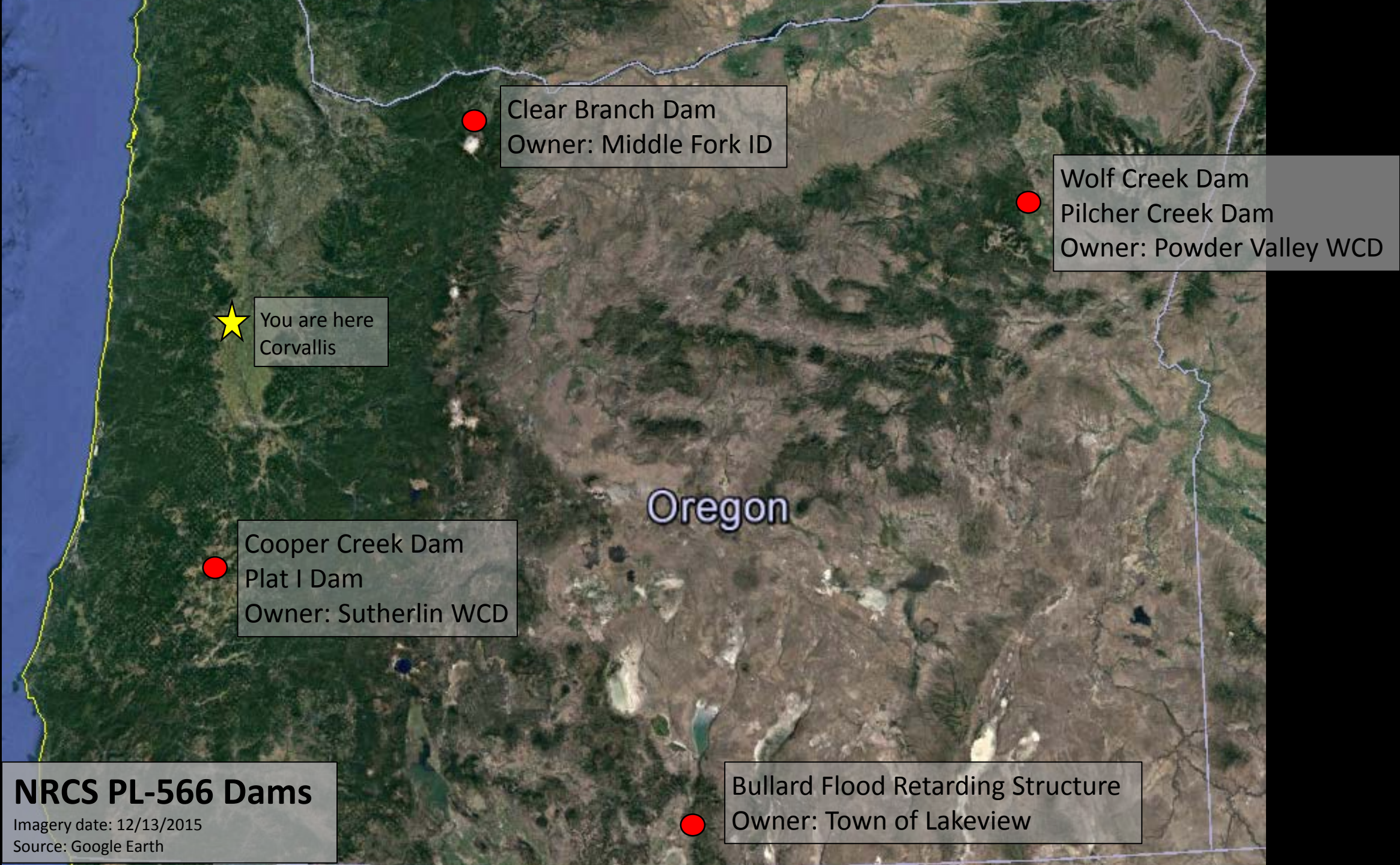
Powder Valley Water Control District

NRCS Watershed Programs

- Congressionally appropriated funds
 - Flood Control Act of 1944 (Public Law 78-534)
 - Watershed Protection and Flood Prevention Act of 1954 (**Public Law 83-566**)
- Project Sponsors have constructed more than 11,800 flood control dams in 1,300 watersheds in 47 States and Puerto Rico since 1948 with NRCS financial and technical assistance.
- Estimated \$2.2 billion in benefits annually to local communities nationwide.

Watershed Rehabilitation

- Helps project sponsors rehabilitate aging dams constructed under the Watershed programs, as these dams are reaching the end of their 50-year design life.
- Since 2014, NRCS has invested about \$345 million in Watershed Rehabilitation projects.
- NRCS Oregon invested about \$5.5 million to date in Watershed Rehabilitation.



Clear Branch Dam
Owner: Middle Fork ID

Wolf Creek Dam
Pilcher Creek Dam
Owner: Powder Valley WCD

★ You are here
Corvallis

Cooper Creek Dam
Plat I Dam
Owner: Sutherlin WCD

Bullard Flood Retarding Structure
Owner: Town of Lakeview

NRCS PL-566 Dams
Imagery date: 12/13/2015
Source: Google Earth

Phases of Watershed Rehabilitation

Assessment

- Risk Assessment
- Failure Index

Planning

- Supplemental Watershed Workplan
- Environmental Assessment
- Consultations and Biological Opinion

Design

- Permits

Construction

- Federal contracts

Oregon Watershed Rehabilitation

Assessment

- Four assessments completed
- Two assessments complete in 2017

Planning

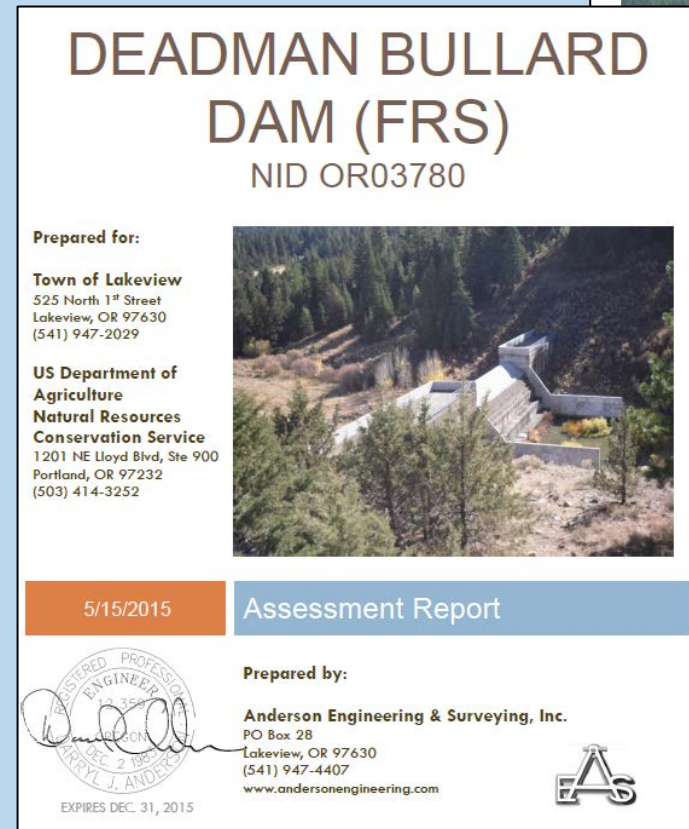
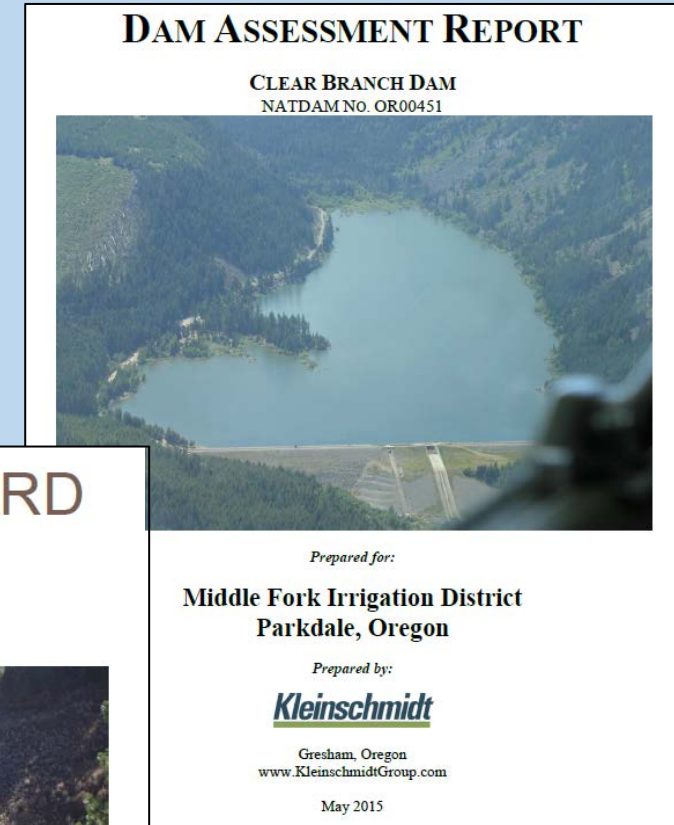
- Three dams in Planning Phase

Design

- Two dams funded for Design

Construction

- One dam funded for construction



Findings – Assessment & Planning

There are data gaps and mountains.

- Incomplete historic design files and records
- New survey instrumentation and computing technology
- Longer and bigger data sets of extreme events

Findings – Assessment & Planning

The target has moved, and continues to move.

- Understanding of seismicity has changed.
- Design standards have changed and continue to change
- Outdated hazard classifications

Cooper Creek Dam earthquake loading

- Design Peak Ground Acceleration (1968) = $0.05g$
- NRCS Max Design EQ loading – High Hazard Dam:
0.5% in 50-years or 10,000-year return period
- USGS Peak Ground Accelerations (2008):
0.5% in 50 years $\geq 0.7532g$

Clear Branch Dam hazard classification

- Originally designed as a Significant Hazard dam in 1960's.
- Currently designated as High Hazard dam by FERC and OWRD.
- NRCS upgraded hazard class to High as a result of 2015 assessment.
- Hazard Class impacts design criteria.
- Multiple sources of design criteria.

Findings – Assessment & Planning

Surround yourself with good partners.

- Many stakeholders representing local, state, federal, and Tribal interests.
- Upwards of seven regulatory partners.
- Complex technical studies require unique and specialized knowledge.

Summary

There are data gaps and mountains to overcome in order to reach a target that seems to keep moving. Having strong partnerships helps to navigate the hurdles

The challenge is striking a balance between data overload, paralysis by analysis, and financial feasibility in a complex regulatory environment where human life is at stake.

What additional information is needed?

Updated Technical Studies:

- Site Specific Probable Maximum Precipitation studies
- Probable Maximum Flood routings
- Adequate characterization of foundation and embankment materials
- Slope stability analysis and seismic hazard assessments
- Environmental assessment and biological opinion

Have Oregon PL-566 dams and reservoirs deteriorated and become less safe and resilient over time?

No. However, our understanding of extreme events has changed over time while federal dam safety policy has also changed.

Now we know more and we know better.

Design standards have changed, and continue to change, as we learn more and have better data sets. (Some) Dams must meet higher standards than what they were designed for.

Oregon Project Sponsors do outstanding job of operating and maintaining their PL-566 structures, including regulatory compliance.

Are financial resources sufficient to make essential investments in dam and reservoir infrastructure?

No.

Additional funds are needed to assess, plan, design, and construction rehabilitation measures.

In the West, we are facing the additional challenges of managing water supply in droughts and addressing ESA compliance, which can increase rehabilitation costs.

For more info:

Meghan.Walter@or.usda.gov

The U.S. Department of Agriculture (USDA) prohibits discrimination against its customers. If you believe you experienced discrimination when obtaining services from USDA, participating in a USDA program, or participating in a program that receives financial assistance from USDA, you may file a complaint with USDA. Information about how to file a discrimination complaint is available from the Office of the Assistant Secretary for Civil Rights. USDA prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex (including gender identity and expression), marital status, familial status, parental status, religion, sexual orientation, political beliefs, genetic information, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.)

To file a complaint of discrimination, complete, sign, and mail a program discrimination complaint form, available at any USDA office location or online at www.ascr.usda.gov, or write to:

USDA
Office of the Assistant Secretary for Civil Rights
1400 Independence Avenue, SW.
Washington, DC 20250-9410

Or call toll free at (866) 632-9992 (voice) to obtain additional information, the appropriate office or to request documents. Individuals who are deaf, hard of hearing, or have speech disabilities may contact USDA through the Federal Relay service at (800) 877-8339 or (800) 845-6136 (in Spanish).

USDA is an equal opportunity provider, employer, and lender.

Persons with disabilities who require alternative means for communication of program information (e.g., Braille, large print, audiotope, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).