

Dull Knife Watershed Dam Johnson County, Wyoming



A concrete labyrinth spillway and mass concrete spillway chute and stilling basin were installed as part of the rehabilitation project.

The Dull Knife Dam in the North Fork Powder River Watershed was constructed in 1966 by the North Fork Water Users Association with the assistance of the NRCS Watershed Protection and Flood Prevention Program. The Water Users Association formed the Dull Knife Irrigation District in 2014 which is now responsible for management of the dam.

The dam was constructed as a significant hazard dam. A breach analysis study in 2005 highlighted the loss of life, livestock and property that would occur if a breach of the dam occurred and the dam was reclassified to high hazard.

The existing auxiliary rock spillway had been continually eroding since the dam was constructed and had progressively gotten worse. Erosion not only occurred when water flowed over the spillway, but it also progressed from freeze-thaw cycles that continually eroded the fractured rock material.

Major design items included a downstream buttress on the main dam, slip lining the existing 36-inch diameter outlet pipe (460 ft), additional rip rap on the main dam upstream slope, an impact basin and flow measurement flume for the main dam, replacement of the thimble and intake gate for the outlet works on the main dam, new concrete labyrinth spillway, mass concrete spillway chute and stilling basin, foundation drains for both the main dam and saddle dam, and a new auxiliary spillway channel.

The rehabilitation project will maintain irrigation water storage which benefits approximately 3,360 acres and will help protect an estimated 77 people who live and work in 21 residences below the dam and three major roads downstream that would be at risk in the event the dam failed.

Plum Creek Watershed Dam No. 6 Hays County, Texas



A labyrinth weir was installed to replace the current earthen spillway during rehabilitation.

Plum Creek Watershed Dam No. 6 is located inside the city limits of Kyle, Texas. The dam was constructed in 1967 by the Plum Creek Conservation District with the assistance of the NRCS Watershed Protection and Flood Prevention Program.

The dam is one of 18 dams in the Plum Creek Watershed project that were constructed to provide flood control.

The dam was originally designed as a low hazard dam with a 50-year design life. It was designed with a maximum capacity to hold 3,763 acre-feet of water and the ability of containing a 25-year rainfall event of 6.4 inches. The dam was reclassified as a high hazard dam in 2002 when it failed to comply with current dam safety standards and performance criteria.

Rehabilitation of the dam included extension of the dam southeastward; removal of the old auxiliary spillway which currently crosses over Goforth road; installation of a labyrinth weir design spillway; installation of a new intake riser and impact basin; and a realignment of Goforth road.

The total cost of the rehabilitation project was \$7.8 million. NRCS provided 65 percent of the cost of the project; the Texas State Soil and Water Conservation Board provided 33.25 percent and the Plum Creek Conservation District provided 1.75 percent. Federal funds for the project came from NRCS Small Watershed Program Rehabilitation funds.

The dam provides flood protection for houses and roads downstream.

Watershed Rehabilitation Progress Report January 2019

The Watershed Program: Providing Multiple Benefits to Communities for 75 Years

Congress established the Watershed Program by enacting the Flood Control Act of 1944 (Public Law 78-534) and the Watershed Protection and Flood Prevention Act of 1954 (Public Law 83-566).

Under these authorizations, the USDA Natural Resources Conservation Service (NRCS) has assisted watershed project sponsors in the construction of more than 11,845 flood control dams in 1,271 watersheds in 47 States since 1948.

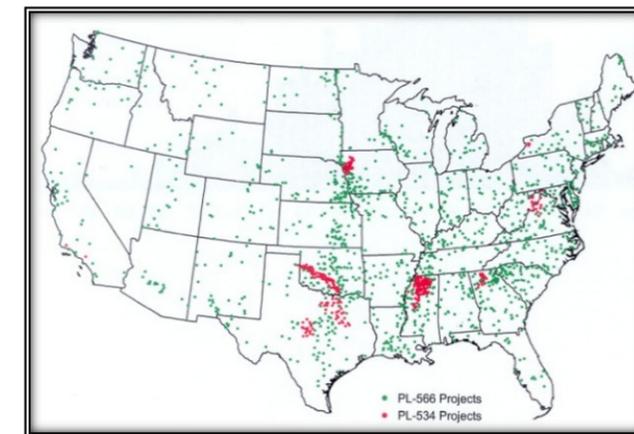
These projects provide an estimated \$2.2 billion in annual benefits in reduced flooding and erosion damages, recreation, water supplies and wildlife habitat.

Time Has Taken Its Toll on Dams

Many dams today are in a far different setting than when they were constructed. Population has increased; residential and commercial development has occurred upstream and downstream from the dams; land uses have changed; sediment pools have filled; and concrete and metal components have deteriorated.

Many dams do not meet current State dam safety standards that have more stringent requirements than when the dams were built.

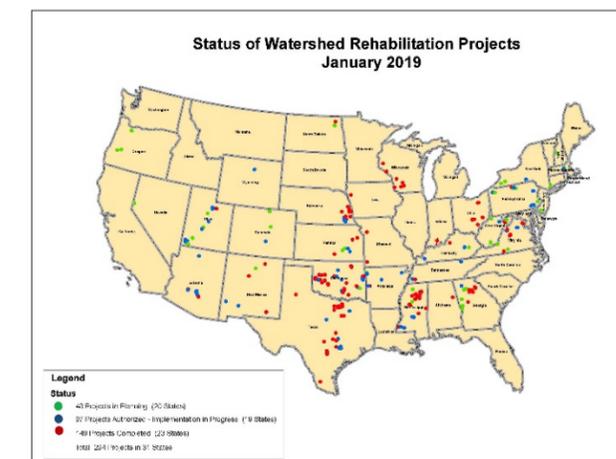
Many of these dams are also nearing the end of their planned service life of 50 years. Some of these dams need rehabilitating to ensure they remain safe, continue to function as designed and continue providing benefits. In some cases, additional new benefits such as adding water supply storage and recreation areas are a part of rehabilitation projects.



Flood control dams have been constructed in 1,271 watersheds in 47 States.

Status of Rehabilitation Projects

As of January 2019, there are 294 approved rehabilitation projects in 31 States. One hundred and forty-nine (149) of these projects in 29 States have been completed; 97 projects in 19 States are being implemented (either in design or construction phase); and 49 projects in 20 States are in the planning stage.



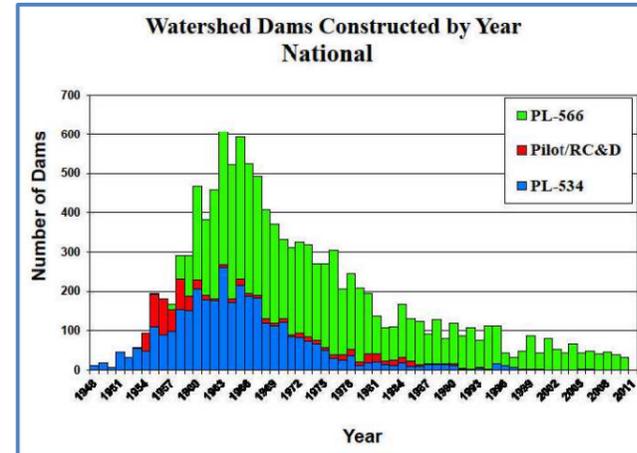
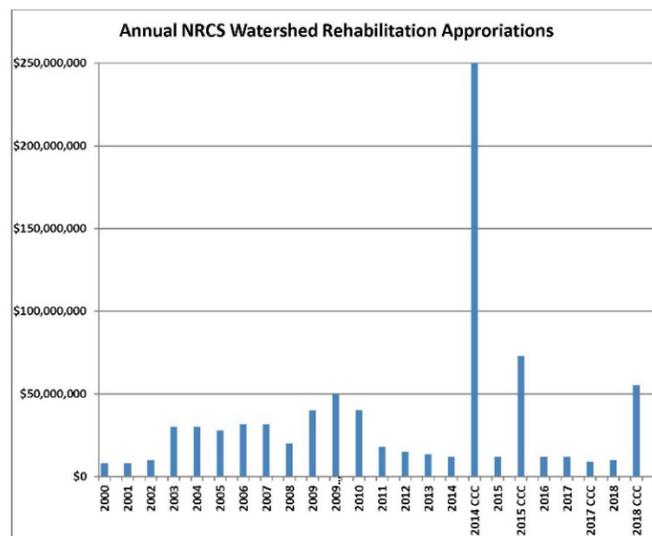
Watershed Rehabilitation Amendments of 2000

Congress passed the Watershed Rehabilitation Amendments of 2000 which amended the Watershed Protection and Flood Prevention Act (Public Law 83-566) to authorize the NRCS to provide technical and financial assistance to watershed project sponsors in rehabilitating their aging dams.

The purpose of rehabilitation is to extend the service life of the dams and bring them into compliance with applicable safety and performance standards or to decommission the dams so they no longer pose a threat to life and property.

NRCS provides technical assistance and 65 percent cost share on approved rehabilitation projects. Funding for projects comes from Congressional appropriations.

Funds for rehabilitation are authorized in the Farm Bills and are appropriated annually by Congress. Discretionary and Commodity Credit Corporation (CCC) funding has been authorized. The 2014 Farm Bill authorized \$250 million in CCC funds. In FY 2015 Congress appropriated \$12 million in discretionary and \$73 million in Farm Bill funding. Congress appropriated \$55.2 million in discretionary funding and \$10 million in CCC funds for the Watershed Rehabilitation program in fiscal year 2018.



Many of the 11,845 flood control dams were built in the 1960s-70s and now are 50 to 60 plus years old. Most were designed for a 50-year service life.

Local Sources of Cost-Share Funds

Local watershed project sponsors provide 35 percent of the cost of a rehabilitation project and obtain needed land rights and permits. The source of these funds varies from state to state.

Some of the methods that states utilized to obtain funding for rehabilitation include:

- Bonds,
- County budgets
- State park division
- State appropriations
- Municipal taxing authority
- Watershed taxing authority
- In-kind technical services

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Included in this publication are examples of rehabilitation projects in four states. Fact sheets with more details on these and other rehabilitation projects are available on the National Watershed Coalition website: www.watershedcoalition.org

Upper North River Dam No. 77 Augusta, Virginia



The current dam is being rehabilitated to bring it up to current dam safety standards.

Upper North River Dam No. 77, known locally as Hearthstone Lake, is a 14-acre impoundment in the George Washington and Jefferson National Forests north of Stokesville, Virginia.

The dam constructed in 1966 is one of three flood control dams in the headwaters of the North River.

The Shenandoah Valley Soil and Water Conservation District (SWCD) developed the original watershed work plan for the Upper North River Watershed in 1960 and the Headwaters SWCD assumed responsibility for the operation and maintenance of the dam in 1993.

The Hearthstone Lake Dam is a high hazard dam constructed for flood prevention.

A contract was awarded for the rehabilitation of the dam in October 2018 and construction is expected to be completed in September 2019.

The project will consist of retrofitting the two-stage principal spillway riser footer and replacing metalwork on the riser tower; augmenting the existing earthen training dike by extending it from upstream of the control section to the hill slope exit; shifting the center line of the auxiliary spillway by 10 feet to obtain borrow material; reconstructing the diversion above the auxiliary spillway; installing a graded filter drain on the upstream right abutment; and improving the access road to the boat ramp and stage gages for flood warning.

Construction cost of the rehabilitation project is estimated to be \$3.7 million. Federal funds for the project will be provided through the NRCS Small Watershed Program Rehabilitation funds.

Rock Creek Watershed Dams 15 & 16 Murray County, Oklahoma



The spillway pipe was replaced during the rehabilitation of Dam No. 16.

Rock Creek Watershed Dams No. 15 and 16 are located in the Rock Creek Watershed Project that encompasses 170 square miles and includes 17 flood control dams. Fifteen dams are in Murray County, one is in Garvin County and one is in Pontotoc County. The Rock Creek Watershed drains into the Washita River.

Rehabilitation of Dam No. 16 was completed in 2018 and Dam No. 15 rehabilitation will be completed in the Spring of 2019.

The dams are being rehabilitated to upgrade them to current dam safety standards and to extend their benefits for another 100 years. The dams are located upstream from the City of Sulphur.

The dams were originally constructed as low hazard dams for flood control in 1961 and 1962. Over time changes in dam safety criteria and development downstream of the dams resulted in reclassification of the dams to high hazard.

The construction project cost is estimated to be \$4.3 million dollars with NRCS providing \$2.5 million and the local sponsors providing \$1.8 million. All technical assistance for planning, design, and construction is provided by NRCS.

The dams will provide an estimated \$60,100 of average annual flood damage reduction benefits. The dams provide flood protection for houses, businesses, schools, roads and agricultural land. They also provide livestock water, fish and wildlife habitat and sediment storage.