

## Magma Flood Retarding Structure Pinal County, Arizona



Rip rap rock was placed for erosion protection for the auxiliary as part of the rehabilitation project.

Magma Flood Retarding Structure (FRS) was originally constructed by the Soil Conservation Service (now NRCS) in 1964. It is operated and maintained by the Magma Flood Control District.

The 5.3-mile-long earthen structure provides flood protection to a portion of the Town of Florence, Arizona, including an estimated 1,100 current residents, 500 residential and commercial properties, agricultural land, and related infrastructure.

The FRS, constructed as a low hazard dam, had developed safety deficiencies and inadequacies since the time of its construction related to embankment cracking and emergency spillway capacity. To address these concerns, the project sponsors requested NRCS to assist in the rehabilitation of the structure.

As a result of changes in dam safety criteria, mitigation of known safety deficiencies and significant downstream development, the FRS was rehabilitated to meet standards for a high hazard dam.

Rehabilitation included raising the top of dam by four feet, construction of a central filter along the length of the embankment, protecting the auxiliary spillway from erosion using rock riprap, and improving the principal spillway outlet with a reinforced concrete dissipation structure and riprap channel. The project was completed in 2016.

## Chiwapa Creek Watershed Dam No. 65 Pontotoc County, Mississippi



A new outlet channel and impact basin was constructed as part of the rehabilitation project.

Chiwapa Creek Watershed Dam No. 65 is one of ten dams constructed in the Chiwapa Creek Watershed. The dam, located in Pontotoc County eight miles west of Tupelo, Mississippi, was constructed in 1963 with assistance of the NRCS Watershed Protection and Flood Prevention Program.

A dam assessment was completed in September 2005 that recommended a change in the hazard class for this dam from low to high based on the potential flooding of three downstream houses and overtopping of a paved county road. The watershed district requested rehabilitation assistance from NRCS in 2005, and rehabilitation construction was completed in October, 2016.

The original objective of the dam was to reduce flood damages along the main stem and tributaries of Chiwapa Creek. The dam was rehabilitated to maintain this objective and upgrade it to meet current hydrologic criteria.

A new riser replaced the existing one and a new 30-inch principal spillway pipe was added on to existing 30-inch principal spillway at the outlet end and an impact and basin outlet channel was constructed. The top of dam was raised approximately 6.8 feet, the auxiliary spillway was widened by approximately 82 feet and a chimney drain was added.

Rehabilitation extended the life of the dam for another 100 years and maintains the benefits of sediment reduction, groundwater recharge, wildlife habitat enhancement, recreation, and water supply.

# Watershed Rehabilitation Progress Report February 2017

## The Watershed Program: Providing Multiple Benefits to Communities for Over 70 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.

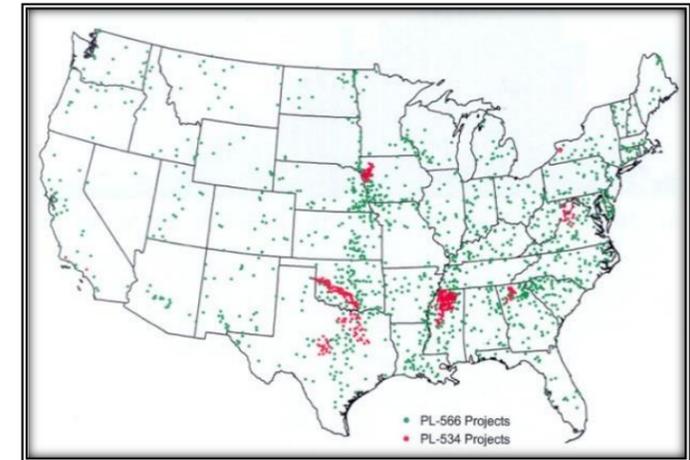
These projects provide an estimated \$2.2 billion in annual benefits in reduced flooding and erosion damages, recreation, water supplies and wildlife habitat.

### 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.

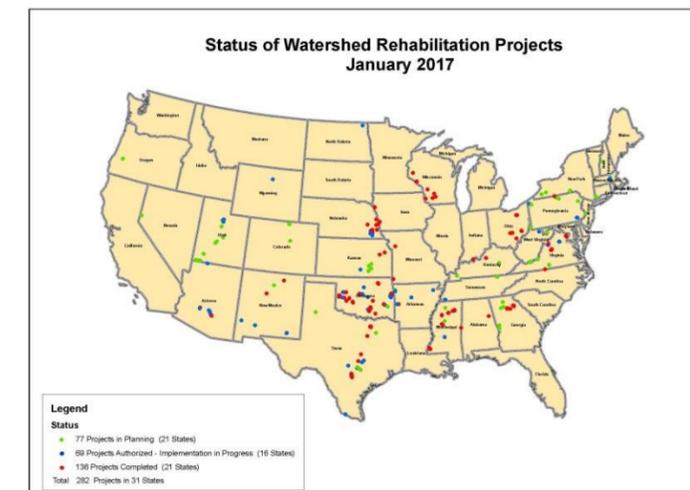
Many of these dams are also nearing the end of their planned service life of 50 years. These need rehabilitating to ensure they remain safe, continue to function as designed and continue providing benefits.



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

### Status of Rehabilitation Projects

As of January 2017, there are 282 approved rehabilitation projects in 31 States. One hundred and thirty-six of these projects in 21 States have been completed; 69 projects in 16 States are being implemented (either in design or construction phase); and 77 projects in 21 States are in the planning stage.



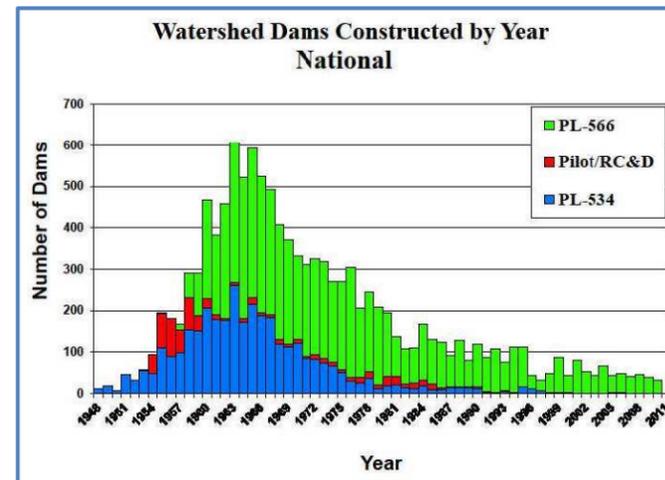
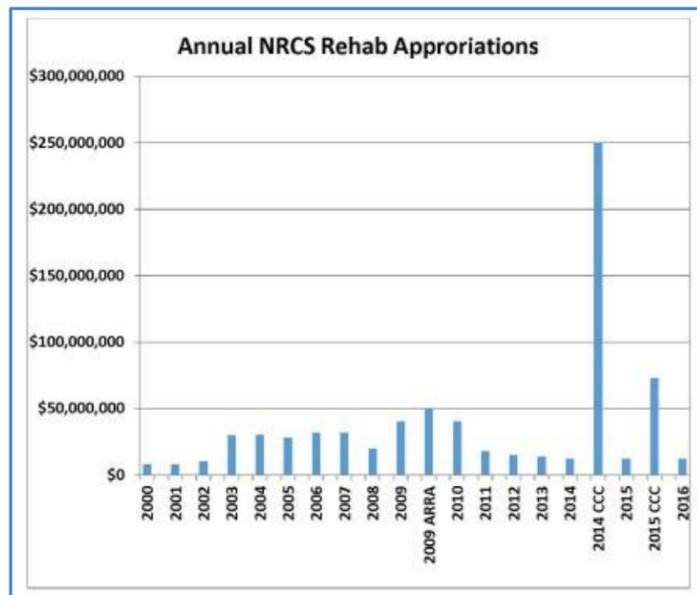
## Watershed Rehabilitation Amendments of 2000

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 \$12 million in discretionary funding for the Watershed Rehabilitation program for fiscal year 2016.



Many of the 11,845 flood control dams were built in the 1960s-70s and now are 40 to 50 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 are being utilized in states 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 NRCS website: [www.nrcs.usda.gov](http://www.nrcs.usda.gov) and the National Watershed Coalition website: [www.watershedcoalition.org](http://www.watershedcoalition.org)

## Upper North River Watershed Dam No. 10 Augusta County, Virginia



Sections of the auxiliary spillway were covered with articulated concrete blocks to prevent surface erosion.

Upper North River Watershed Dam No. 10, known locally as Todd Lake, is located 21 miles from Harrisonburg, Virginia in the George Washington National Forest. The 20-acre recreational area around the lake offers a variety of outdoor activities, including swimming, camping, hiking and picnicking.

The dam was constructed in 1963 for flood control by the Shenandoah Valley Soil Conservation District with the assistance of the NRCS. The Headwaters Soil and Water Conservation District took on the responsibility for the operation and maintenance of the dam in 1993.

Approximately 500 people live in the dam's flood zone, along with businesses, churches and sections of several roads on which an estimated 1,000 vehicles travel daily.

Rehabilitation included replacement of the 18-inch reinforced concrete principal spillway pipe and inlet tower with a 30-inch diameter reinforced concrete conduit with a standard open-top riser. The top of the dam was raised 1.6 feet. The auxiliary spillway was expanded from 40 feet to 140 feet wide and the spillway crest was raised 1.2 feet.

Upgrades were also made to the dam's foundation, embankment, outlet channel and drainage system.

## Calaveras Creek Watershed Dam No. 10 Bexar County, Texas



A new concrete inlet tower and a 42-inch diameter reinforced concrete conduit were installed during rehabilitation of the dam.

Calaveras Creek Watershed Dam No. 10 is located twenty miles southeast of San Antonio, Texas. The dam was constructed in 1958 by San Antonio River Authority and the Alamo Soil and Water Conservation District with the assistance of the NRCS Watershed Program.

The dam is one of seven dams in the Calaveras Creek Watershed project that were constructed to provide flood control for agricultural lands.

The dam was originally designed as a high hazard dam in a rural setting with a 50-year design life. Since construction of the dam there have been changes in land use and population in the watershed, and in the required dam safety standards.

The rehabilitation project was completed in July 2016. Rehabilitation of the dam brought it up to current State dam safety criteria and extended its life and its benefits for another 50 years.

The dam currently provides flood protection for 22 houses, Highway Loop 1604 (encircles San Antonio), four county roads and agriculture land. Future development is expected downstream of the dam due to its location in proximity to San Antonio.