

Stream Restoration Program: Cherokee Indian Reservation, NC

Project Description: The Cherokee Indian Reservation is located in the southern Appalachian Mountains of Western North Carolina and consists of approximately 56,000 acres. The topography of much of the Reservation lands consists of very steep slopes and narrow valleys. In this area, soils are thin and generally highly erodible. Siltation is the primary source of impairment to Tribal waters. Major sources of siltation have resulted from past logging practices, gravel mining, road construction, housing construction, landfill and other development activities. The rock/gravel mined area of Soco Creek has been designated as a priority area for stream bank restoration and reduction of nonpoint source (NPS) pollution.



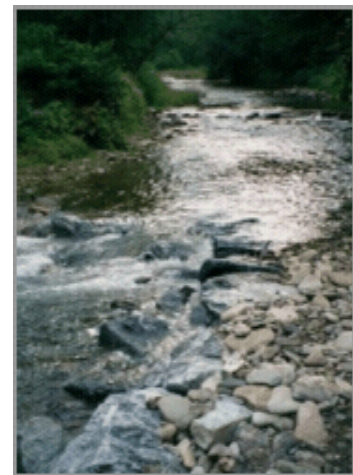
Soco Creek



Sites on Soco Creek and the Oconaluftee River have undergone stream bank restoration by stabilization techniques. Two sites on the Oconaluftee River where stream bank restorations have been completed are Bradley Campground and Standingdeer Campground. At these sites, erosion from overland flow resulted from land disturbance due to the high level of foot traffic by campers. A large part of the problem was campers creating foot paths and removing riparian vegetation on stream banks. This made the banks vulnerable to erosion during storm events.

The objective of the project was to reduce erosion from overland flow and from stream bank failure as the streams undercut their banks at both Bradley and Standingdeer campgrounds. Components of the project were designed to restrict camper access down erodible stream banks with dense vegetation and redirect access down nonerodible boulder stair steps.

To reduce erosion, native riparian trees and shrubs were planted along with grass seeding, and coconut erosion control fabric was installed to hold the soil in place until the vegetation was established. Access for campers to the stream was provided by making a modification to rock vanes (method developed by Dave Rosgen of Wildland Hydrology, Pagosa Springs, Colorado). Without compromising the hydraulic design of the rock vanes, they were extended approximately three feet above their normal design elevation to the top of the stream bank. This is now at the level of the rest of the campground. The purpose of extending the vanes was to make solid rock (boulder) stair steps that serve as access points for campers to enter the stream corridor.



In this project revegetation and rock vane construction were successfully employed for stream bank restoration at Bradley and Standingdeer Campgrounds. Revegetation solved the erosion problem from overland storm flow while construction of rock vanes addressed undercutting of the stream banks. The constructed vanes slow flood water velocities near the banks and

deflect high velocity water toward the channel center to replicate conditions in healthy natural channels. This was a cooperative effort with the Eastern Band of Cherokee Indians, the Natural Resources Conservation and EPA.

As of the summer of 2003, rather than experiencing bank erosion, stream sediment is redepositing along the banks, the vegetation has successfully established and the campers continue to use the rock vanes as stair steps. Over 3000 feet of natural channel restoration has occurred on Soco Creek and over 1.5 miles has been completed reservation-wide.

Lead Agency: Eastern Band of Cherokee Indians
Funding: EPA 319: \$467,850 **Matching:** \$311,967
Project Location: NC, Cherokee Indian Reservation

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