

Kickapoo Tribe stabilizes streambanks, prevents pollution with water project



Kickapoo Tribe in Kansas

Project Description

A set of eroding streambanks along both Plum and Squaw Creeks on the Kickapoo Tribe in Kansas (KTIK) Reservation was the focus of a competitive Clean Water Act (CWA) 319 grant proposal made to EPA in FY2016. The aim of the project was threefold: (1) reduce Nonpoint Source (NPS) pollution; (2) protect the tribe's sole source of drinking water; and (3) protect a tribal cemetery of cultural significance. In total, the pair of projects stabilized approximately one thousand feet of streambank, prevented over 2,170 annual tons of sediment loading into the Delaware Watershed system, protected a tribal cemetery, and reduced the likelihood of pollution of the tribe's drinking water.

The KTIK expanded the breadth of its capacity to stabilize streambanks on the reservation. Particularly regarding CWA 319, the tribe learned how to measure eroded banks, estimate future loss, site stabilization projects, and how to coordinate efforts among engineers and contractors.

GAP funding was utilized in two primary areas: (1) funding the research/writing of the competitive 319 grant proposal, and (2) oversight of the project's Best Management Practices (BMP) implementation. Specifically, the KTIK Environmental Director charged his time to GAP researching and writing the grant proposal and conducting the resulting administrative, programmatic, and coordination oversight of the project.

In terms of GAP Guidebook indicators, the tribe moved closer to completion of the following indicators: (1) *B.8 Establishing Core Technical and Analytical Capacities* - B.8.3: Funding from other sources; (2) *D.3 Indicators of Water Quality Program Capacity* - D.3.15: Tribe has worked with other stakeholders in the watershed to develop a watershed-based plan that identifies nonpoint source pollution problems and options for best management practices; and (3) *B.6 Establishing Core Public Participation, Community Involvement, Education, and Communication Capacities* - B.6.1: Program to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of tribal programs, policies, and activities on minority populations and low-income populations within the tribe's area of program responsibility.

Project Details

Streambank erosion on the Delaware River and its tributaries is the biggest source of soil sediment entering the river water supply throughout the Kickapoo Reservation and the surrounding Delaware Watershed. Soil sediment can carry contaminants which negatively impact water quality. On the reservation, headquartered in Horton, Kansas, this erosion affects the tribe's drinking water and culturally significant sites.

The first of the projects was a 40-foot tall bank that spanned 650 feet. Over the past 22 years, approximately a quarter acre, or 33,109

Project Time Period (FY2016– FY2017)

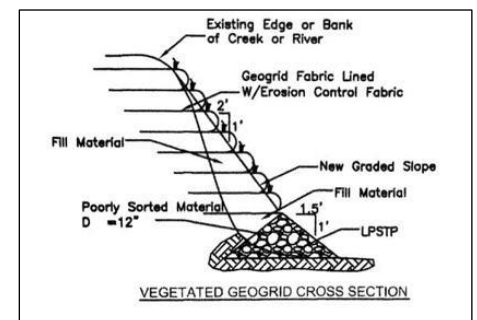
- **Tribal Contact:** Eric Sheets, Environmental Director
- **GAP Project Officer:** Stanley Holder, EPA Region 7
- **Media:** Water
- **GAP Funded Results:**
 - Outreach & Education
 - Program Development (Core Competencies)

Horton, Kansas



Protecting Plum Creek

Prior to stabilization, the Plum Creek streambank eroded at a rate of 12 inches per year, or over 1,500 tons per year. During periods of high flow events, the erosion rate was higher. With each passing year, the streambank's edge crept closer and closer to a tribal cemetery on top of the bank. This project enabled the Tribe to build



tons of sediment were lost, or approximately 12 inches per year. Atop the streambank sits a tribal cemetery that was in danger of being affected within the next 5-15 years due to streambank erosion. This site utilized a longitudinal stone toe protection (LPSTP) device, on top of which geogrid layers were

constructed, which used soil wrapped in geosynthetic materials. On top of this structure, willow stakes were planted as well as a vegetative buffer strip. Annual amounts of sediment loading reduced by this project site is approximately 1500 tons per year.

The second of the projects was an 11-foot tall bank that spanned 350 feet and was identified by the Watershed Restoration and Protection Strategy (WRAPS) watershed-based plan to be in a priority sub-watershed. Since measurement began 22 years ago, the site has lost over 14,700 tons from the bank. The site utilized bank reshaping at a 3:1 slope, along with the LPSTP device at the water's edge. Annual amounts of sediment loading reduced by this project site is approximately 670 tons per year.

Overall, the project was informed by three goals: (A) Goal 1, Objective 3 of KTIK Nonpoint Source Management Plan: reducing pollutant loads through streambank stabilization projects; (B) Section 4.1.2 of the WRAPS Watershed-Based Plan: sediment load reduction for Perry Lake; and (C) Goal 2, Objective 2.2 of EPA's FY 2014-18 Strategic Plan for: protect and restore the quality of rivers and streams on a watershed basis.

Community Response

The benefits of the project on the community relates to both water and culture. The tribe's intake for its drinking water is located approximately one mile downstream of the Plum Creek site. By reducing nearly 2,170 tons of sediment into the watershed, the tribe has reduced the likelihood of pollutants retained and transported by the sediment from reaching the water intake.

And notably, a tribal cemetery was saved from destruction. At certain points, the edge of the cemetery was ten feet from the eroding streambank. Previous estimates showed that the erosion would reach the cemetery in 5-15 years, depending on the frequency of high flow events. After completion, the tribe shared with the community an overview of the project and how it positively impacted its residents and the environment.



Map of Tribal Boundaries

The Kickapoo Tribe in Kansas Reservation is a 5x6-mile tract in Brown County, Kansas. The reservation's major water course, the Delaware River, and its three tributaries--Plum, Craig, and Squaw Creeks--provide the reservation with a surprising diversity of wildlife and habitat. Of the tribe's 1600 enrolled citizens, approximately half

Innovation

This project was innovative because of the technology employed at the Plum Creek site. The site used a geogrid stabilization structure, which is a stair-stepped assemblage of soil wrapped in geosynthetic materials raising approximately ten feet. The structure is very effective at guarding against erosion in high-flow events and provides solid initial stability for the vegetative buffer strip and willow stakes to take root, providing further reinforcement themselves.

Next Steps

This project was a continuation of the tribe's efforts to stabilize the numerous streambank erosion concerns on the reservation. Because the reservation is both surrounded by and contains farmland with little to no agricultural conservation practices, certain streambanks are highly erodible. In the past, the tribe has utilized LPSTP and cedar tree revetment to good effect to address this issue. Moving forward, the Kickapoo would like to utilize more geogrid technology to protect the tribe's valuable streambanks.

