Red River Basin Riparian Project:
Turtle River Site Passes the Test

Over the past 50 years, most riparian areas in eastern North Dakota watersheds have been mismanaged and degraded by activities like overgrazing, intensive agriculture, and indiscriminate logging. It is estimated that more than 50 percent of the original forest cover in many watersheds in eastern North Dakota has been cleared for agricultural use. In addition, unmanaged grazing has damaged a significant portion of the remaining riparian forests. Overgrazing, in combination with the 1987 to 1990 drought, left many riparian areas in a weakened condition and susceptible to insects and diseases.

The lack of woody vegetation along the river left the streambank vulnerable to severe erosion.

Initiated in 1994, the Red River Basin Riparian Project seeks to restore degraded riparian corridors in the Red River Basin in North Dakota. An advisory committee with representatives from several state and federal agencies advises the project on behalf of the project's sponsor, the Red River Resource Conservation and Development Council (RC&D). Healthy riparian corridors offer benefits for water quality, as well as flood damage reduction and wildlife habitat.

The project sponsors plan to establish up to nine demonstration sites in the Red River Basin, restoring at least 100 river miles during the 5-year project term. At one demonstration site, the Turtle River site, the lack of woody vegetation had left the streambank vulnerable to severe erosion. The situation was compounded by groundwater seeps above the baseflow elevation of the river. Between 1978 and 1995, the river migrated approximately 3.5 feet per year to the east until it was only 80 feet from the county road. When the bioengineering project was initiated 1995, the site had a vertical bank about 14 feet high.

Successful bioengineering practices

Willows were planted along the restoration site to provide long-term stability

To stabilize the bank and stop further migration toward the road, several bioengineering techniques were implemented. The first step was to create a stable slope for the vegetation. The 14-foot vertical bank was reshaped to a 3:1 slope, using the waste from the top as fill at the toe. Riprap was then installed along the toe to the bankfull elevation. Bioengineering practices were installed as part of a workshop featuring the Natural Resources Conservation Services' bioengineering team from Michigan. Willow fascines and a brush mattress were installed along the 300-foot length to armor the bank and to begin the revegetation process.

Passing the test

Serendipitously, the Turtle River project coincided with the biggest flood of the century in the Red River valley, so it has sparked a new appreciation of river systems.

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It has also been well positioned to offer solutions that recognize the characteristics of a naturally stable river system.

Although some maintenance was required each spring in 1996 and 1997, the project bioengineering has survived both spring floods and a 17-inch rainstorm in July 2000. The lessons learned from experience at the Turtle River site include the following:

After the bioengineering work was complete, the streambank was able to withstand spring floods and an unusual 17-inch rainstorm in July 2000.

- Soil/plant material contact is best provided by using water to place the soil over brush mattresses and fascines. Sponsors used a power washer to wash in the soil placed by the backhoe.
- The loose fill used at the toe can be susceptible to erosion, especially in the first season. The site appears to have responded well to the repair work, but adding roughness to the toe would have helped. The use of root wads will be demonstrated at the Sheyenne River site.
- Deer and beaver find willow sprouts irresistible. At the Turtle River site, time will tell whether animals were detrimental to the survival of the willows. In the future the use of repellants might be necessary.

Riparian areas are crucial to the long-term protection and enhancement of the streams, rivers, and lakes in eastern North Dakota. Well-managed riparian zones help provide optimum food and habitat for stream communities, while at the same time serve as buffer strips for controlling nonpoint source pollution. Used as a component of an integrated management system (including nutrient management and erosion control), riparian buffers can greatly benefit the quality of the state's surface water resources.

At a workshop, the Natural Resources Conservation Service demonstrated the implementation of several bioengineering techniques.

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Primary Sources of Pollution:

- streambank erosion, agriculture (grazing), and logging

Primary NPS Pollutants:

- Sediment

Project Activities:

- bioengineering practices (slope stabilization, installation of riprap, revegetation)

Results:

- establishment of riparian vegetation that withstands flooding reduced sedimentation