



**Clean Michigan Initiative
Nonpoint Source Grant**
Tracking code 1999-0029



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Rifle River Watershed Restoration

July 1, 2000 - December 31, 2005

The Rifle River Watershed is located in east central Lower Michigan and is a tributary to Saginaw Bay. It encompasses portions of Arenac and Ogemaw Counties. Due to its high quality natural resource base the Rifle River supports agriculture, forestry, and diverse recreation including fishing, canoeing, hunting, trapping and birding. The Rifle River is being affected by sediment and nutrient enrichment. Identified sources include stream bank erosion, road crossings and agriculture. This project improved water quality by implementing several different Best Management Practices (BMPs) which limit the amount of sediment and nutrients and better protect the Rifle River and its resources.



Grant Amount: \$ 319,600

Match Funds: \$ 278,100

Total Amount: \$ 571,700

Best Management Practices:

- 68 Stream banks stabilized
- 26,200 linear feet exclusionary fencing installed
- 7 Livestock crossings installed
- 100+ acres of riparian buffer/filter strips installed
- 4,600 linear feet of windbreaks planted
- 2 recreational sites improved
- 1 road stream crossing improved
- 2 sand traps installed

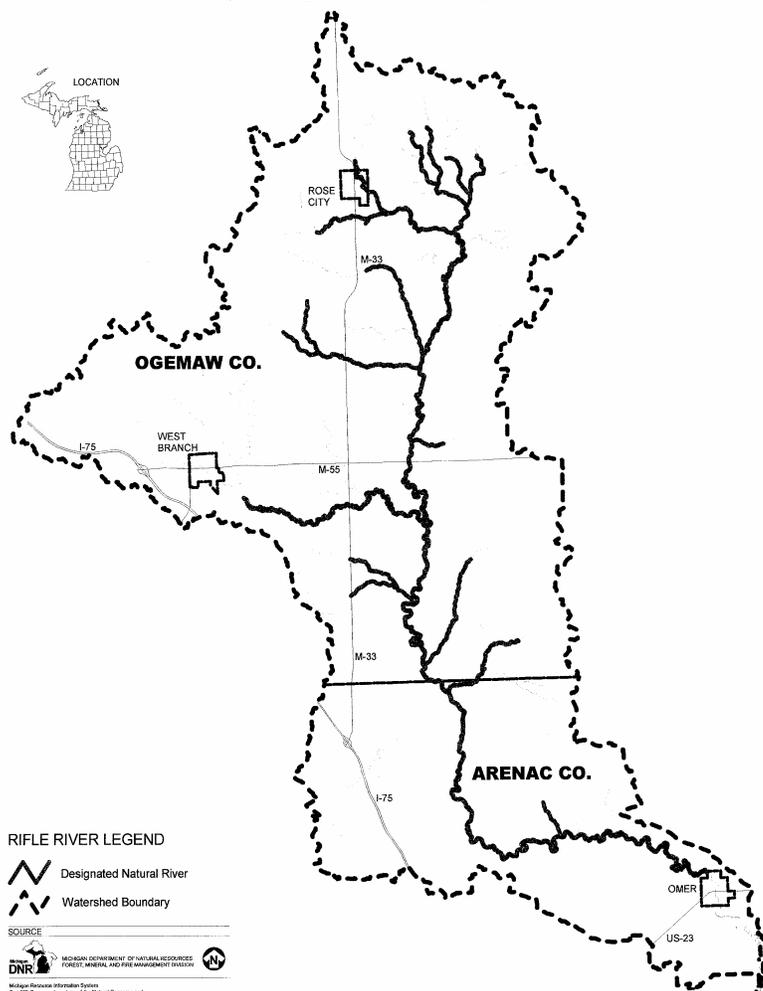
Annual Load Reductions:

- 6,600 Tons of Sediment
- 6,800 pounds of phosphorus
- 13,400 pounds of nitrogen

Partners involved:

- Trout Unlimited
- Conservation Districts
- Saginaw Chippewa Indian Tribe
- MSU Extension
- USDA Natural Resources Conservation Service
- US Fish and Wildlife Service
- Michigan Department of Environmental Quality
- County Soil Erosion Control Offices

RIFLE RIVER



RIFLE RIVER LEGEND

- Designated Natural River
- - - Watershed Boundary

SOURCE:
MICHIGAN DEPARTMENT OF NATURAL RESOURCES
FOREST, MINERAL, AND FIRE MANAGEMENT DIVISION
Michigan Watershed Information System
Part 306 Resource Inventory of the Natural Resources and
Environmental Protection Act, 1994 PA 451, as amended
DATE: 05/01/00



Lunker Structures provide fish habitat and stabilize stream banks.



After installation the bank is re-vegetated.



Tree Revetments help stabilize lower and upper slopes.



Just one year after installation vegetation begins to fill in areas between tree revetment rows.



Road Stream Crossings play a major role in sediment deposition.



Alternative Erosion methods such as rock chutes stabilize outlet and reduce impact.