

Title: Excluding cattle improves channel stability, instream habitat and macroinvertebrate populations in Fitzgerald Creek.

Waterbody Improved: Fitzgerald Creek (HUC 04030108), a tributary to the Menominee River in Dickinson County, Michigan. Fitzgerald Creek is not on Michigan's **nonattainment** list.

GRTS Number: Grant number 97547404, Project number 25.

Problem: Unlimited cattle access to the creek created a wide, muddy wallow in the stream channel, destabilized the stream banks, and degraded instream habitat and macroinvertebrate populations.

Project Highlights: Best management practices installed in 2007 were 5,510 feet of cattle-exclusion fencing, a rock-lined stream crossing, and 240 feet of bank stabilization.

Results: Based on the Michigan Department of Environmental Quality's biological and habitat monitoring protocol, cattle exclusion had substantial effects on instream habitat and the macroinvertebrate community (Table 1):

- Scores for instream habitat metrics (cover, pool variability, sediment deposition), riparian conditions (bank stability and vegetation) and channel sinuosity improved substantially.
- Channel width decreased by 53 percent
- Maximum channel depth increased by 30 percent
- Average sediment particle diameter increased from 5.5 mm (fine gravel) to 72 mm (small cobble), due to the placement of stone on the streambed
- Total macroinvertebrate taxa increased by 17 percent.
- The number of sensitive taxa (mayflies, stoneflies and caddisflies) increased by 43 percent.

Also, the streambed in the project reach lacked aquatic macrophytes in 2002, but had been colonized by eelgrass (*Vallisneria americana*) by 2012.

Partners and Funding: The grantee was the Dickinson Conservation District. Grant funds for this specific project were \$14,246, with a local match of \$4,039. The Natural Resources Conservation Service provided technical assistance to the grantee. **This project is located in the Michigan 1st Congressional District.**

Photographs:

Figure 1. Cattle in Fitzgerald Creek in 2002, Prior to Exclusion



Figure 2. Over-Wide Channel in 2002, Prior to Cattle Exclusion



Figure 3. Restored Channel in 2012, After Cattle Exclusion



Figure 4. Eroding Bank in 2002, Prior to Cattle Exclusion



Figure 5. Same Location as Figure 4 in 2012, After Cattle Crossing Installation



Data:

Table 1. Pre and Post-BMP Stream Habitat and Macroinvertebrate Community Data.
(BMPs were installed in 2007)

Metric	Pre-BMP (2002)	Post-BMP (2012)
<i>Instream & Riparian Habitat Scores</i>		
Epifaunal substrate/ available cover	7	14
Pool substrate	7	15
Pool variability	11	17
Sediment deposition	10	20
Channel sinuosity	6	11
Bank stability	7	10
Vegetative protection	7	10
Overall rating	"Good"	"Excellent"
<i>Channel Measurements (n = 2 each year)</i>		
Average thalweg depth	1.06 feet	1.38 feet
Average stream width	32.7 feet	15.3 feet
Mean particle size	5.5 mm	72 mm
<i>Macroinvertebrate Community</i>		
Total taxa	24	28
Sensitive taxa (mayflies, stoneflies, caddisflies)	7	10

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