

Title: Channel restoration of Big Creek

Opening paragraph: Excessive sedimentation altered the stream channel and damaged instream habitat in Big Creek. Volunteers removed excess woody debris and blocked braided side channels to divert flow and recreate a single main channel, which transported fine sediment out of the reach and re-exposed gravel riffles suitable for fish reproduction. These improvements have persisted for 10 years and counting.

Problem: Historic timber harvest practices and eroding road/stream crossings deposited large amounts of sediment in the channel of Big Creek, a tributary to the Chocoday River in Marquette County in Michigan's Upper Peninsula. This excessive sedimentation raised the streambed, buried the natural gravel bottom, widened and braided the channel, degraded macroinvertebrate populations, and destroyed fish habitat necessary for trout and salmon reproduction.

Project Highlights: In 1994 and 1995, volunteers organized by the Marquette Conservation District restored a 1.5 mile reach of Big Creek by removing instream debris and blocking braided side channels to divert flow and recreate a single main channel (a "thalweg"). Normal stream flows through the new main channel were expected to mobilize fine sediments and re-expose gravel riffles.

Results: By late 1995, just months after completion of the restoration, stream channel width had narrowed by over 50%, which removed sand from the channel and re-exposed the gravel substrate preferred by young trout and salmon (Table 1). The habitat improvements have persisted through 2005, with no additional interventions. Fish numbers also increased in a short time (Table 2).

Partners and Funding: In 1994 and 1995 the Marquette Conservation District received a total of \$59,500 of Section 319 funds to hire a volunteer coordinator and execute a volunteer-based restoration of Big Creek. Michigan Department of Natural Resources staff conducted the fish population and stream habitat quality surveys in the 1990s, and Michigan Department of Environmental Quality staff repeated the stream habitat survey in 1999 and also qualitatively inspected the site in 2005.

Photos:

Figure 1. Before and After Thalweg Restoration

1994



2005



Table/graph/chart:

Table 1. Physical Channel Measurements

Measurement	1992 (Before restoration)	Late 1995 (Immediately after restoration)	1999 (4 years after restoration)
Average channel width (ft)	34.0	15.7	17.1
Gravel substrate (%)	2.7	47.5	41.0
Sand substrate (%)	85.5	31.7	47.5

Table 2. Fish Inventory

Species	1992 (Before restoration)	1995 (Immediately after restoration)
Coho salmon smolts	10	25
Brown trout juveniles	5	26
Brook trout juveniles	3	7

Contact information: John Suppnick, MDEQ-Water Bureau; 517-335-4192; suppnickj@michigan.gov.