



Section 319

NONPOINT SOURCE PROGRAM SUCCESS STORY

WISCONSIN

Stream Restoration Efforts Result in Rebound of Brown Trout Population

Waterbody Improved

Livestock grazing along three segments of the West Branch Sugar River resulted in the destruction of in-stream habitat. Therefore, Wisconsin added these segments to its 1998 303(d) list of impaired waters for not supporting their designated uses. Dane County began working to restore the fishery in the early 1980s. The restoration efforts reduced nonpoint source pollution from sheet and rill erosion, restricted cattle access to streams and riparian areas, and improved management of animal waste from barnyards and feedlots. After nearly 30 years and \$1 million in private, local, state and federal watershed restoration activities, Wisconsin removed all three segments from its 2004 303(d) impaired waters list. These segments of the West Branch Sugar River are the first to be delisted in Wisconsin as result of environmental restoration.

Problem

The West Branch Sugar River is in Dane County in southern Wisconsin. The West Branch runs southeast from the Village of Mount Horeb for 19 miles into the mainstem Sugar River just upstream of Lake Bellevue. Sediment and habitat alteration prevented the West Branch from supporting its beneficial uses of default warm water forage fishery (WWFF), default warm water sport fishery (WWSF), and cold water Class II trout fishery (COLD).

Over many years, cropland sediment erosion, overgrazed pastures, unrestricted cattle access, barnyard runoff, and streambank and gully erosion degraded the river and altered the habitat. Dane County began restoration efforts in the early 1980s with project funds from the U.S. Department of Agriculture's (USDA's) Watershed Protection and Flood Prevention Program—commonly known as the PL-566 Watershed Program.

In 1997, after completion of the PL-566 project, the county conducted a watershed assessment that included both a general habitat survey and fish surveys at five specific locations on the West Branch. The fish survey assessment team analyzed the data using the Coldwater Index of Biotic Integrity (CW IBI), specifically formulated to evaluate assemblages with two to four species in small, coldwater streams. The CW IBI ratings were poor at all the sites. Both the general habitat and fish surveys showed that the lower reaches of the West Branch were inhabited by warm-water species such as carp, black crappie, white sucker and a variety



Figure 1. West Branch Sugar River: Pre-rehabilitation conditions.

of eurythermal minnows, which are adaptable to a wide range of temperatures. In addition, the available habitat was insufficient to sustain a number of top-level carnivores, such as brown trout, and was rated poor. In particular, the in-stream surveys indicated that the habitat upstream of State Highway 92 suffered from environmental degradation and had habitat scores ranging from poor to fair. The main problems included steep, highly eroded streambanks, shallow water depth and heavy silt deposits in the stream (Figure 1).

Project Highlights

Building on 13 years of local watershed restoration activities, more work began in 1999 to improve the riparian corridor and habitat upstream of State

Highway 92. Project participants placed more than 20,000 feet of riprap to stabilize the toe of the stream; reshaped 58,000 feet of streambank; seeded 17 acres; and placed more than 1,000 fish habitat structures in the stream. Participants placed riprap on the banks and seeded them, establishing grasses with good root structure to preserve bank integrity. Reestablishing vegetation along the streambanks also provided a buffer to mitigate runoff from the surrounding agricultural fields.

Other project elements included narrowing the river in appropriate places to increase flow velocity, flushing the soft sediment out of the channel and uncovering the gravel bottom, which is essential to trout reproduction.

Nonprofit organizations will hold 20-year, 66-foot-wide easements on the project area for public access. Landowners began practicing whole farm planning and conservation tillage to reduce erosion of their farm lands. The willingness of more than a dozen landowners to participate was instrumental to the success of this project.

Results

In 2002 habitat evaluations at three sites found that the habitat had improved, and scores ranged from good to excellent (Figure 2).

By 2004 Dane County had achieved its goal—the fishery was restored. Cool and cold-water species now inhabit the sections of river above the project area. Wisconsin Department of Natural Resource (DNR) expects trout populations to continue to increase with improved water quality and habitat conditions. Another positive indicator is evidence of multiple year classes of trout, including 3–4 inch young-of-the-year (YOY). Surveys conducted in 1997 showed no YOY present at any of the sampling sites. By 2003 surveys showed the presence of YOY at 10 of the 13 stations, indicating that natural reproduction is taking place in the West Branch.

The West Branch responded to the best management practices, which helped increase baseflow and reduce erosion. Repairing the riparian cor-



Figure 2. West Branch Sugar River: Post-rehabilitation conditions.

ridor and adding stream habitat enabled the river to meet its potential as cold water Class II trout water. These changes, including improvements in habitat, increased numbers of indicator species and evidence of natural reproduction of trout, resulted in Wisconsin delisting all three segments in 2004 from its 303(d) list.

Partners and Funding

Wisconsin DNR, the Dane County Land Conservation Department (LCD), landowners and several volunteer organizations worked to improve the riparian corridor and habitat of the stretch of the West Branch Sugar River upstream of State Highway 92. Dane County LCD received four Targeted Runoff Management grants from DNR, totaling \$520,000 for riprap, fencing, shaping, seeding and stabilizing the river banks. Support for fish habitat structures placed at strategic locations along the river included more than \$210,000 in cost-shared funds from DNR trout stamp funds, the USDA Natural Resources Conservation Service, the Wildlife Habitat Improvement Program, nonprofit organizations including Trout Unlimited, Deer Creek Sport and Conservation Club, Madison Fishing Expo, Badger Fly Fishers, and volunteers. EPA section 319 grant funding provided DNR staff support.



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