



NONPOINT SOURCE SUCCESS STORY

Illinois

Stabilizing and Vegetating Streambanks on Cahokia Creek at Roxanna Landfill to Improve Stream Quality

Waterbody Protected

Cahokia Creek, in southwestern Illinois, was impaired due to a loss of instream cover, alteration of streamside or littoral vegetative cover, and changes in depth and flow velocity. Illinois placed 10.69 miles of Cahokia Creek on the Clean Water Act Section 303(d) list of impaired waters from 2006 through 2018. To address this impairment, the Heartlands Conservancy used Clean Water Act Section 319(h) funding to install best management practices (BMPs), including stream channel stabilization, streambed stabilization and channel re-meandering. These practices improved the physical attributes of the stream that protected water quality by reducing the risk of erosion and the flow of pollutants into the stream. As a result, Illinois removed Cahokia Creek from the Section 303(d) list in 2020/2022 for the loss of instream cover, alteration in stream-side or littoral vegetative cover, and flow alteration.

Water Quality Challenge

The Burrough's Branch–Cahokia Creek watershed is in Madison County, Illinois. Cahokia Creek flows southwest to the Mississippi River. Agriculture is the watershed's primary land use. The creek's streambanks were severely eroding due to a lack of vegetation (Figures 1 and 2). As a result, the stream was listed as impaired for loss of in-stream cover, alteration in streamside or littoral vegetative cover, and flow alteration in 2006.

Illinois determined the status of this impairment using Illinois Environmental Protection Agency (EPA) field observations and notes documenting the impairment. Illinois EPA Surface Water Section staff use "A Qualitative Habitat Evaluation Index" to assess whether instream cover is "nearly absent" (due to anthropogenic causes); or, "recent channelization/no recovery" has occurred; or, substrate quality indicates "silt heavy;" or, there is no riparian width; or, bank erosion is "heavy/severe." The impairment leads to erosion and an increase in sediments and nutrient runoff entering the stream.



Figure 1. Typical bank erosion before project

Project Highlights

In 2011, Heartlands Conservancy led a project to restore a portion of Cahokia Creek located in Madison County near Edwardsville, Illinois. The partners received Clean Water Act Section 319 funding to support several projects, including:

- Stabilizing streambanks
- Installing rock riffles to create “pool and riffle” sequences, which aided regeneration and improved dissolved oxygen levels while preventing upstream degradation
- Establishing vegetation on previously bare, eroding banks to improve dissolved oxygen levels
- Installing 66-foot-wide filter strips along a 3,000-foot reach to slow runoff and filter nutrients and sediment
- Adding stone toe protection (riprap) to streambanks to increase reaeration, reduce sedimentation, decrease bank slope and protect vegetation

From 2011 through 2014, partners installed five BMPs designed to create stable, vegetated meander bends (Figures 3 to 6). These measures significantly reduced the amount of pollution reaching the stream. Locally led efforts continue to address the loss of instream cover, alteration of stream-side vegetative cover, and the changes in flow depth and velocity in the Burrough’s Branch–Cahokia Creek watershed.

This project transformed a 4,920-foot segment of a highly unstable stream channel on Cahokia Creek (IL_JQ-05) into a 3,000-foot stable meandered stream by realigning the channel in three locations to achieve a larger radius curve and installing two rock riffles. Approximately 3,390 feet of stone toe protection with suitable woody vegetation was established on the outside banks of all meander bends. A 66-foot-wide vegetated riparian corridor was established along the entire 3,000-foot reach. In addition, 2.5 acres of wetlands were restored from the abandoned oxbows. Additionally, a presentation of the work done as part of the Cahokia Creek relocation at the Roxana landfill project and a tour of the project site were provided at the 9th Annual Erosion and Sediment Control Workshop held in 2013.



Typical bank erosion before project with mass wasting and fallen trees

Figure 2. Erosion before project

Best Management Practice	Number Installed	Units	Comments
Outreach And Education	2	INDIVIDUAL UNITS	
Stream Channel Restoration (stream bed)	3000	FT	Includes 66 feet of riparian buffers and stone toe protection. Channel remeandering reduced channel length from 4900 feet to 3000 feet to establish more stable channel.
Wetland Restoration	2.5	AC	

Results

Following BMP implementation, the Illinois EPA assessed water quality in Cahokia Creek to determine whether it should remain on the Section 303(d) list. Based on the field observations by qualified Illinois EPA staff, it was determined that the creek was no longer impaired for a loss of instream cover, alteration in stream-side or littoral vegetative cover, or changes in depth and flow velocity. Consequently, stabilizing streambanks and installing vegetative cover improved water quality enough to justify removing Cahokia Creek from the Section 303(d) list in 2018.

These improvements are largely attributed to BMPs addressing streambank or shoreline modification/destabilization caused by channelization—the primary source of these pollutants. The 2014 BMPs resulted in estimated reductions of 3,866 pounds/year of phosphorus; 7,733 pounds/year of nitrogen; and 2,133 tons/year of sediment.



Willow stakes planted March 2014 growing on streambank May 22, 2014. Notice leaves and debris around willow stakes left by spring floods.

Figure 3. Streambank restoration in progress

Partners and Funding

Partner Type	Agency	Funding	Notes
Federal	Clean Water Act Section 319(h) grant	\$500,000	
Other	HEARTLANDS CONSERVANCY	-	Primary grant recipient. Led outreach and education efforts. Oversaw the grant and work completed as part of the grant.
Private Sector	REPUBLIC SERVICES/ROXANNA LANDFILL	\$1,071,600	Funding for match in restoring streambanks and vegetating riparian area.



Looking downstream at lower Rock Riffle structure and Fish Passage Structure on May 22, 2014

Figure 4. Restored streambank in progress



5 rows of tree seedlings leafed out on riparian area, May 22, 2014

Figure 5. Riparian restoration in progress



Looking upstream at upper Rock Riffle structure and Fish Passage structure spring 2014

Figure 6. Post-construction restoration



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