

Bloomington Indiana Naturalizes Creek Bank to Manage Stormwater and Establish Native Plants

Bloomington, Indiana Naturalizes Creek Bank to Manage Stormwater and Establish Native Plants

Project Summary

The City of Bloomington began a creek naturalization project in 2002 to address significant erosion caused by intense storm water pressure and to enhance biodiversity in a popular local park. Through partnerships with local organizations, the City reduced flooding impacts, improved water quality and increased plant and animal species diversity in the improvement area. The project supported Bloomington's Community Wildlife Habitat certification application through the National Wildlife Foundation. Fully naturalizing 0.3 miles of creek bed cost \$45,000 over two years and was largely funded through a local neighborhood improvement grant.

“Overall, the project sought to provide wildlife habitat, improve stormwater quality, decrease creek flow rate and reduce mowing costs and impacts.”

How did they do it?

Actions	Applicable Resources
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Actions

Applicable Resources

Identify waterways available for improved ecological management

- The City identified the creek in most need of naturalization in Bloomington.
- The project collected feedback from residents and piloted community-driven ideas for implementation, including different turf removal approaches.

Promote habitat restoration through native landscaping and conservation on public property.

- The City worked with a local firm to design a native plant garden and determine erosion correction measures.

Use “soft” shoreline maintenance

- The City planted the target area with live plants and seeded native plant species through erosion control blankets over the course of a year.

- The EPA's National Stormwater Calculator <<https://www.epa.gov/water-research/national-stormwater-calculator>> is a software application that estimates the annual amount of rainwater and frequency of runoff from a specific site using green infrastructure as low impact development controls.
- To better understand the relation between water-quality stressors and ecological conditions, the Regional Stream Quality Assessment <[>https://webapps.usgs.gov/rsqa/#!/> examines the multiple water-quality factors that are stressors to aquatic life throughout the region.](https://webapps.usgs.gov/rsqa/#!/)
- The Water Erosion Prediction Project Model <<https://www.ars.usda.gov/midwest-area/west-lafayette-in/national-soil-erosion-research/docs/wepp/research/>> is a process-based, distributed parameter, continuous stimulation, erosion prediction model for use on personal computers.
- The Climate Change Response Framework <<https://forestadaptation.org/adapt>> provides options to help land managers adapt forests and ecosystems to changing conditions.
- The EPA's Enhancing Sustainable Communities with Green Infrastructure <<https://www.epa.gov/smartgrowth/enhancing-sustainable-communities-green-infrastructure>> is a guide to help communities better manage stormwater while achieving other economic, social, and environmental benefits.

Background

Bryan Park is a central urban green space in Bloomington. A creek runs through the middle of the park, providing ecological, recreational, and aesthetic amenities to residents. The creek naturalization effort was started after a local nonprofit, the Center for Sustainable Living, approached the City to create a project that could support certifying Bloomington as a Community Wildlife Habitat through the National Wildlife Federation. For years the park had also been dealing with impounding water and interference with current uses due to flooding. Since the average precipitation per year is expected to increase in the Midwest, and Bloomington is at risk of increased flooding, flooding concerns needed to be addressed. Overall, the project sought to provide wildlife habitat, improve stormwater quality, decrease creek flow rate and reduce mowing costs and impacts.

Implementation

The City managed the project, but it was designed and installed by a local firm, Eco Logic LLC, which works to restore native plant communities. Some of the initial species introduced included native wet mesic grasses, sedges, rushes, and wildflowers. To establish these plants along the creek, the existing turf grass needed to be killed and removed. Some community members advocated that no herbicides be used to remove the turf. To address these concerns and assess the feasibility of alternative turf removal approaches, the City experimented with cardboard, plastics and sheet composting on three test plots. In the end, none of the alternatives worked given the scale of the project and the City moved forward with herbicides. The shady portions were planted with live plants and sunny areas were seeded with native plant species through erosion control blankets over the course of a year.

Timeline

The creek naturalization was initiated in 2005 and completed in 2007.

Funding

The total project cost was \$45,000.

Outcomes and Conclusions

The creek naturalization project improved 0.3 miles of creek bed in Bryan Park, located in the heart of Bloomington's downtown residential area. By establishing native plants along the creek bed, the project enhanced aquatic and terrestrial habitat in the park, and increased wildlife viewing and educational opportunities for park visitors. Biodiversity has noticeably improved as the new flora support more varieties of songbirds, pollinators and stream macro-invertebrates. Citizen scientist volunteers have monitored and tracked these species successes through Hoosier Riverwatch and the Bloomington Adopt-A-Stream program. Furthermore, for many years the creek had suffered from increasing sediment loads, dead zones and high sun exposure. This project corrected bank erosion, improved water quality in the creek and increased availability of shaded habitat. Since the completion

of the project, the native vegetation has been able to hold the banks more effectively than turf during heavy storm events. Indeed, after the project was completed in 2007, it successfully managed a large flood just one year later in 2008.

Overall maintenance required for the creek shrunk and shifted such that it reduced mowing and thus fossil fuel use, and cost, in the park. The Department of Parks and Recreation maintains the improvement area along with some community volunteers. Maintenance requirements include invasive species removal, weeding, trimming existing plants, planting new plants, mulching and monitoring stormwater drainage.

Additional naturalization projects underway in Bloomington include a five-acre prairie planting funded through the Indiana Department of Natural Resources and U.S. Fish and Wildlife Services. The site was planted in 2018 with the goal of creating new, drought-resistant habitat for wildlife and native plants.

Challenges

While overall creek bed maintenance time and costs have decreased, maintenance requirements remain a challenge for the City. Aspiring for a biodiverse, herbaceous creek bed and eliminating mowing shifted the requirements to more hands-on tasks. The City has experienced mixed success in using volunteers to assist. Other challenges have included invasive species crowding out desired plants and winter-time aesthetics.

Lessons Learned

Project manager Steve Cotter said, "If I had to do it all over again, I would have incorporated trees into the vision from the outset and focused on selectively guiding the succession of the creek bed foliage rather than maintaining specific native plants. Initially we had only planned to plant wildflowers, grasses, and sedges. Cultivating a long-term herbaceous riparian zone for 0.3 miles of creek bed was an unrealistic goal without annual burning or mowing."

Questions for discussion

These questions are designed to inspire readers—especially those wanting to learn broadly about climate change solutions—to think critically about the case study on this page and encourage deeper, more meaningful conversations. A list of ERIT case studies that include discussion questions can be found on the Resilient Communities Case Studies <<https://eri.iu.edu/who-we-work-with/educators/resilient-communities-case-studies.html>> page.

1. What are some ways using native species in landscaping could help cities like Bloomington prepare for climate change?
2. What are some steps the city could take for the next time they plan to install a new natural space?

3. Use the Regional Stream Quality Assessment <<https://webapps.usgs.gov/rsqa/#!/>> website to investigate a particular site of interest to you and find the Score Card. Explore a region or click on “View Results” to see all sites.
- a. What are some of the water quality stressors and what do you think could be contributing to them based on the site location?

Project Resources

- Learn about the National Wildlife Federation’s Community Wildlife Habitat™ program <<https://www.nwf.org/CommunityWildlifeHabitat>>
- Learn about the Hoosier River Watch <<http://www.hoosierriverwatch.com/>>

For more information about the City of Bloomington's park restoration project, contact:

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Similar Case Studies

- See how Gary, Indiana installed green infrastructure to revitalize blighted areas and manage stormwater <[gary-indiana-installs-green-infrastructure-to-revitalize-blighted-areas-manage-stormwater.html](#)> .

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