



# Green Infrastructure & Stormwater Management CASE STUDY

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## Carpenter Lake Nature Preserve and Lake Restoration Project

**Location:** Southfield, MI

**Client:** City of Southfield

**Design Firm(s):** Environmental Consulting & Technology, Johnson Hill Land Ethics Studio

**Landscape architect/Project contact:** Merrie Carlock ASLA, City of Southfield , Chet Hill,  
Principal, Johnson Hill Land Ethics Studio

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**ASLA Chapter:** Michigan



Photo: Merrie Carlock

### Project Specifications

**Project Description:** The Carpenter Lake Nature Preserve is part park and part green infrastructure project which restored a deteriorated 6-acre lake impoundment for wildlife habitat, urban fishery, recreation, and stormwater management. A 3-stage weir dam detains up to 2' of water across it's surface during storm events, minimizing downstream erosion and flooding. The lake was re-shaped to foster wildlife and game fish habitat and invasive carp species were removed. The park retains natural canopy of trees with minimal development. Open areas restored with native prairie. Accessible trails and fishing access used local and recycled

materials. A permeable parking lot and bioswale demonstrates stormwater features to the public.

**Project Type:**

Open space - park

Part of a new development

**Design features:** Bioswale, porous pavers, and curb cuts. Stormwater is retained in a stone reservoir under the porous paver parking lot. Excess surface water runoff is directed to a bioswale. Water retained from the upstream watershed and surrounding area over the lake surface for up to 2 feet additional depth.

**This project was designed to meet the following specific requirements or mandates:**

State statute, to meet funding criteria

**Impervious area managed:** less than 5,000 sq/ft

**Amount of existing green space/open space conserved or preserved for managing stormwater on site:** greater than 5 acres

**The regulatory environment and regulator was** supportive of the project.

**Did the client request that other factors be considered, such as energy savings, usable green space, or property value enhancements?** No.

## Cost & Jobs Analysis

**Estimated Cost of Stormwater Project:** \$1,000,000-\$5,000,000 (Public funding: Federal, state, local, EPA National Wet Weather Demonstration Project, Michigan Natural Resources Trust Fund, NPS Land for Parks Program)

**Related Information:** Detailed cost information available if requested. Park Development - \$700,000. Dam reconstruction and lake dredging - \$2,000,000, Wildlife Habitat & Lake restoration - \$300,000, Fishery Management - \$130,000,

**Was a green vs. grey cost analysis performed?** No

**Cost impact of conserving green/open space to the overall costs of the site**

**design/development project:** As a nature preserve property, it was integral to the project.

**Cost impact of conserving green/open space for stormwater management over**

**traditional site design/site development approaches (grey infrastructure)?** Did not

influence costs. The City of Southfield has a commitment to promoting green infrastructure and innovative stormwater management techniques. No specific cost analysis was made.

**Number of jobs created:** No new. Some construction jobs.

**Job hours devoted to project:**

Planning and Design: Not available

Construction: Not available

Annual Maintenance: Not available

## Performance Measures

**Stormwater reduction performance analysis:**

The lake and dam weir structure was designed to accommodate most 2-year level storm events.

**Community & economic benefits that have resulted from the project:** Southfield is a 1st tier suburb adjacent to the City of Detroit with a 70% African American population. The community attachment to this property is great and almost eclipses our other parks in popularity. Many people utilize the property for nature watching and exercise year round.

## Project Recognition

Michigan Recreation & Park Association 2011 Park Design Award, Michigan Chapter American Public Works Association 2009 Environmental Project of the Year (Less than \$5 Million)

## Additional Information

**Links to images:** <http://pwmag.com/industry-news.asp?sectionID=760&articleID=1501255>

A proposed LEED certified nature center will provide public education regarding the watershed and the impact of human actions on water quality. The center will feature a green roof, stormwater collection and rain gardens.

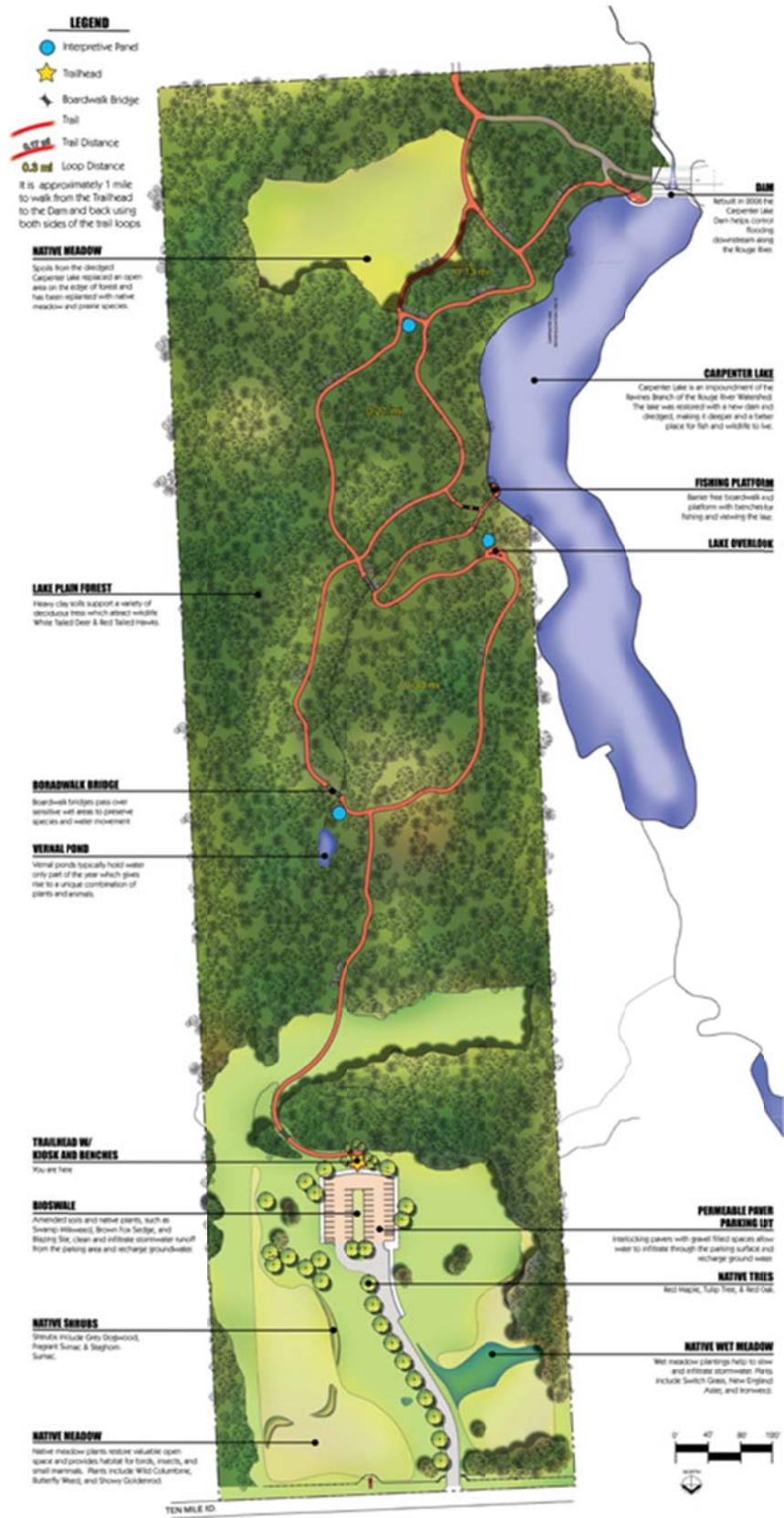


Photo: Johnson Hill Land Ethics Studio