INTEGRATED WATERSHED RESTORATION IN AN URBAN ENVIRONMENT: CANDLER PARK, A CASE STUDY

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Abstract. The Candler Park, City of Atlanta watershed restoration project was the result of cooperative efforts among neighborhood volunteers and City of Atlanta over a period of nearly 6 years. The goal of the project was to improve water quality and reduce storm water peak discharge downstream on the Candler Park golf course. Environmental Services, Inc., was contracted to provide design services and to implement the construction of the project design. The implemented design employed an integrated approach which provided for the day-lighting of a system of springs and streams, removing a concrete flume, and constructing a new channel using a natural channel design approach. In addition, three extended detention wetland systems were constructed, energy dissipation step-pools installed, the riparian buffer was created and revegetated, and the restored stream was reconnected to its floodplain.

INTRODUCTION

A combination of environmental, social, and economic pressures drives the need for watershed-scale restoration whether a project site is in an urban or rural setting, yet some of these pressures are unique to or magnified in an urban landscape.

Often, communities hope to mitigate for these problems through storm water management efforts alone, especially through enforcing regulations requiring storm water detention basins in a developing landscape. Yet these partial solutions are inadequate to restore the watershed. Instead, effective watershed-scale restoration requires an integrated solution, which includes storm water management, stream restoration, wetland restoration and creation, and reestablishment of the riparian buffer.

Background

In 2006, the City of Atlanta completed its first 319(h) project to be funded by the U.S. Environmental Protection Agency (EPA)—the restoration of the Candler Park Brook from a straight, concrete-lined conveyance to a natural state along with restoration of its watershed. The $875,000 project was funded by a 319(h) grant from the EPA and Georgia Environmental Protection Division ($525,000 in grant funds) to the City of Atlanta ($350,000 in local community bond match). This project is ground-breaking not only because it is the first Atlanta 319(h) project to be funded by the EPA, but it is also among the first to forge partnerships on water issues between the city of Atlanta and EPA professionals. This partnership is particularly timely as Atlanta develops solutions for combined sewers and wastewater treatment.

The concept for restoring the natural function of the Candler Park golf course watershed originated with a group of local citizen volunteers. The volunteers were associated with the Candler Park Neighborhood Organization and were instrumental in bringing the project to a reality.

Park Pride, a non-profit organization working in a public/private partnership, was contracted by the City to facilitate implementation of the project. In 2004, Park Pride contracted Environmental Services, Inc., for a storm water management and restoration plan for Candler Park Brook and its associated tributaries. In 2006, Environmental Services Inc. (ESI), teaming with a utility contractor, Heavy Constructors, was selected to implement the design for restoring function to a portion of a 0.25 square mile watershed system on a portion of the Candler Park Golf Course located in East Central Atlanta.

The project readily serves as a model for other watershed groups applying for 319 funding from the EPA. It also demonstrates how local volunteers can come together to improve their neighborhoods.

Land Use History

In the late 1920s, streams located within the park were piped via sanitary sewers and concrete flumes in an effort to control the storm water on the Candler Park golf course. Drainage was improved by piping a spring and filling the valley. As a result of the piping and flumes and the absence of any storm water management facilities throughout the Candler Park residential neighborhoods, downstream flooding had been a problem for decades.

APPROACH

The project team undertook a watershed assessment and inventory to evaluate the historic uses of the land in the project area and related environmental issues. In the process, the team delineated drainage patterns and basins; land use/land cover; zoning; utilities; storm water flow paths; and existing storm water conveyance, pipes and control structures.

A survey of natural features provided a deeper understanding of the watershed. These included existing vegetation, soil types and infiltration rates, wetlands, floodplain areas, steep slopes, and other environmentally sensitive areas. The team benchmarked existing conditions against a reference watershed and identified constraints and opportunities for restoration.

It was clear from the assessments and analysis of the watershed that an integrated restoration approach was necessary. Thus, the ESI team's solution combined several elements of storm water management and natural-channel design stream restoration, including creation of four separate detention basins, ranging in area from perhaps 200 square feet to 8,000 square feet, the largest being a wetlands system; use of the golf course fairway as a floodplain; restoration of the riparian buffer to retain and slow the flow of rain water; and natural-channel stream restoration. The plan was accepted by the community, including avid golfers, who fully understood the effects of the design on the "play" of the course.

In total, approximately 1,420 tons of natural boulders were used to construct control structures, including 20 cross vanes, which are horseshoe-shaped rock structures that deflect sheer stress away from the banks; 13 j-hooks, which serve the same purpose at meander-bends; and six step pools, which were used to dissipate energy in a high gradient reach. Approximately 1,900 linear feet of stream channel was day lighted and allowed access to its floodplain; that is, brought back to the surface where it had previously been run underground through pipe.

During the fall of 2006, final adjustments were made to structures in the stream channel. Planting of the riparian buffer was completed in December and January of this past dormant season. Shortly after stream restoration was completed, small schools of fish were found in the pools and glides, which had not seen fish for more than 40 years—living evidence of what natural-channel stream restoration can accomplish in a very short time.

IMPLICATIONS

The channel has been successfully restored to a stable form and the stream has maintained the capacity to transport the sediment bedload. The restored channel has successfully endured numerous bankfull discharge events. The extended detention wetlands that were retrofitted are functioning to improve water quality and attenuate storm flows.

The process of analyzing, developing, and implementing an effective watershed-scale restoration plan involves a number of players—owner, project team, permitting agencies, and the community—and a painstaking series of steps.

Outreach to the community was vital to the success of the project. Stakeholder meetings identified additional issues and concerns that needed to be addressed and identified areas of potential community involvement. The educational component fosters understanding of watershed restoration concepts and acceptance of the approaches to be used in the project.