Innovative BMPs Award Submission
FEBRUARY 2014

The Maryland-National Capital Park and Planning Commission
Part I - Innovative BMPs Submission

1. Basic Project Data
   1. Type of Practice
      Innovative BMP – Parking Lot Retrofit
   2. Category Applying for
      Innovative BMPs
   3. Applicant Contact Information
      Mitra Pedoeem, Chief, Park Development Division
      Parkside Headquarters
      9500 Brunett Avenue
      Silver Spring, MD 20901
      301-495-2535
      Mitra.Pedoeem@montgomeryparks.org
   4. Practice Design Team
      Erin McArdle – Project Manager, Park Development Division, Montgomery Parks
      Stephen Reid – Park Development Division, Montgomery Parks
      Doug Stephens – Water Quality Manager, Southern Region, Montgomery Parks
      Mohammed Turray – Park Manager, Beach Drive Management Area, Montgomery Parks
      Carole Bergmann – Forest Ecologist, Park Planning and Stewardship Division, Montgomery Parks
      Montgomery Parks NPDES Team
      Highway and Safety Services – Contractor
   5. Runoff Volume treated by the BMP (cubic feet)
      N/A
   6. Drainage Area (acres)
      0.4-acre*
      *primary benefit was removal of 0.25-ac impervious; also receives 0.4-ac impervious runoff
   7. Percent of Impervious of Drainage Area
      100%
   8. Approximate Cost
      ~$38k (~$35k for construction and ~3k for planting)

2. Narrative (2 pages; 1,300 words max) that explains:
   1. Why the project is being submitted for a specific award category
   2. How that project meets one or more of the category design criteria
   3. Respond to following:
      • Intent of project and key objectives accomplished
      • Major site, design, or construction challenges you had to overcome or why the project is unique
      • Any education or outreach or community involvement that occurred as part of the project

3. Photographs – minimum 4; at least one “before” photo; .jpg/.png format; label each photographs with a descriptive file name of what you are trying to portray or provide additional document with this information; maybe update descriptions?

Supporting Materials: additional photos, design plans, etc.
Part II - Narrative
The Meadowbrook Parking Lot Naturalization Project combined removing deteriorating infrastructure and restoring a floodplain wetland ecosystem on Montgomery County parkland. The project removed over 10,000 square feet of asphalt located in the floodplain of Rock Creek in Chevy Chase, Maryland, and in its place created a wetland feature that receives stormwater runoff from the remaining parking lot area. Joint efforts from individuals and groups across Montgomery Parks including engineers, aquatic biologists, forest ecologists, natural resources specialists, and operational staff helped to ensure the success of this project. This project is part of a larger effort within Montgomery Parks to identify existing infrastructure that has negative environmental effects, remove any obsolete infrastructure, and restore more appropriate native habitat and ecosystems for that area.

The opportunity to remove infrastructure that can be a source of pollution takes retrofitting one step further by removing previously developed areas that are no longer needed and restoring native habitat. It is known that impervious surfaces have detrimental effects on a watershed including increased storm flows and flooding, thermal impacts on downstream waters, and stream bank erosion. These impacts can be reduced or eliminated through the removal of impervious surfaces and rehabilitation of land to a natural vegetated state. The newly restored wetland receives drainage from the remaining parking lot, thus capturing, storing, and filtering stormwater runoff. Through interception of stormwater runoff from the remaining 0.4-acre of adjacent asphalt parking for the maintenance facility, the created wetland system promotes downstream water quality through the absorption and filtering of excess nutrients and other pollutants.

The asphalt parking lot was installed several decades ago for employee parking at the Meadowbrook Maintenance Facility, located within parkland designated as Rock Creek Stream Valley Unit 1. This parking lot and the majority of the maintenance facility are located within the 100-year floodplain of Rock Creek. Given contemporary values and regulations, it is unlikely the facility would be built today in this environmentally sensitive area. However, the asphalt parking lot was designed and constructed based on the regulations and recommendations at that time. When the facility was reconstructed in the early 1980’s, minimal stormwater management was required. The maintenance yard currently operates under an Industrial Stormwater NPDES (National Pollution Discharge Elimination System) Permit, and various projects have been implemented to address stormwater runoff generated directly from the maintenance yard activities. These projects include constructing covered storage bins to prevent runoff from material storage, constructed wetlands to treat runoff from the main yard, an enclosed vehicle wash to direct wash water into the public sewer system, new fueling pumps with aboveground tanks, and changing behaviors to comply with Best Management Practices (BMPs). However, since this employee parking lot is outside of the main yard, the untreated runoff from the oversized parking lot was not addressed with these previous projects.

By rearranging and minimizing space size in the parking lot, it was determined that portions of the impervious area could be reduced and still accommodate current and future staff parking needs at the facility. In recent years a small portion (approximately 600 square feet) of this parking lot perpetually held 2-4” of standing water, rendering it unusable. This was thought to be due to an underground seep; however, the water source was revealed to be a leaking water line, as is discussed below.

During construction in July 2012, a hydraulic excavator removed the asphalt and graded aggregate base down to native soils, which would serve as the wetland surface. An average of 9-12” of material was removed and hauled offsite. A rock lined spillway was installed to transition runoff from the remaining parking lot to the new wetland area in order to prevent erosion of the transition area. To lengthen the flow path of the incoming runoff, a compost sock was installed perpendicular to the spillway. Seeding with a wetland seed mix took place immediately, and additional planting of the newly created wetland took place in phases as the hydrology...
of the new system was established and became stable. Plants were then selected specifically for site conditions and installed during the optimal planting seasons as they were available. Erosion and sediment controls were implemented during construction to reduce sediment runoff prior to vegetative stabilization.

An unexpected encounter during construction occurred when a continuous water source was discovered, likely contributing to the wet parking lot corner. The flow was inconsistent with the characteristics of a spring or seep, and a test of the water confirmed the presence of chlorine and fluoride, indicators of treated water. Further investigation revealed a leak from a yard hydrant releasing treated water into the floodplain. A valve was promptly closed to halt the illicit discharge that was both unnecessarily exposing the environment to chemicals in treated water and placing additional stress on water treatment and distribution systems. Despite the loss of this water ‘source’ to the area, wetland hydrology developed quickly in the removal area after construction and allowed for microtopographic zones with varying hydrologic characteristics.

This construction effort was a catalyst to begin a cycle of natural regeneration in the new wetland ecosystem. Once the hydrology in the removal area was established, the project team installed a variety of wetland plantings to serve as a functional component of this wetland system, including common rush (Juncus effusus), swamp milkweed (Asclepias incarnata), pickerelweed (Pontederia cordata), lizard’s tail (Syrurus cernuus), joe-pye weed (Eupatoriadelphus fistulosus), blue flag (Iris versicolor), and cinnamon fern (Osmunda cinnamomeum). Woody species were also installed, including southern arrowwood (Viburnum dentatum), American sycamore (Platanus occidentalis), river birch (Betula nigra), swamp white oak (Quercus bicolor), alder (Alnus serrulata), silky dogwood (Cornus amomum), and American hazelnut (Corylus Americana). These native plants provide valuable wildlife habitat for native species that depend on wetlands. Within one year of construction, the new wetland feature has attracted and supported the reproduction of a variety of wildlife including box turtles (Terrapene carolina), American toads (Bufo americanus), wood frogs (Rana sylvatica), red-eared sliders (Trachemys scripta elegans), American goldfinch (Spinus tristis) and native crayfish (Procambarus acutus), as well as numerous dragonfly species. It is expected that this diversity will grow as the wetland is further established over time. This restoration project transformed an area that was once a source of pollution into a valuable and functional natural resource in one of Montgomery County’s most valued parks.

Intrinsic to Montgomery Parks’ mission and values is the ongoing balance between recreational amenities and experiences (including access to these amenities through parking lots) and protection and stewardship of natural resources. The Meadowbrook Parking Lot Naturalization Project is a prototype of a project where an organization can re-evaluate existing impacts of past developments, and look for opportunities to reduce those impacts in an effort to avoid, minimize, and mitigate to the extent possible. As owners of over 35,000 acres of land, this project also highlights a change in perspective on land use and natural resource stewardship. Historically, the environmental sensitivity of an area was not a major consideration when looking for locations to build structures. However, as the ecological importance of these areas is recognized, the balance shifts towards restoration of past developments.

The primary goal of removing pavement and increasing wetland area in the floodplain of Rock Creek has been met with great success. Additionally, this project has piqued the interest of staff and helped to serve as an educational forum, as well as the unexpected advantage of halting a water leak. Overall, this relatively inexpensive and simple project has had and will continue to have a large impact on water quality in the greater Rock Creek watershed.
Part III - Photographs
01-Before Construction looking west June 2012
02-Before Construction June 2012 looking east
03-During Construction - active pavement removal
04-During Construction July 2012 looking east
05-During Construction #2 July 2012 looking east
06-Planting Team June 2012
07-Supplemental Planting June 2013
08-After Supplemental Planting June 2013 looking east
09-After Construction looking west June 2013
10-Current State July 2013 looking east
11-Panoramic June 2013
12-American Toads
13-Tadpoles
14-Red Eared Slider sunning on woody debris
15-Box turtle
Meadowbrook Parking Lot Naturalization Project:
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Meadowbrook Parking Lot Naturalization Project:
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**Part IV - Supporting Documentation**

Aerial Maps:

1 of 3 – Meadowbrook Parking Lot Naturalization – Location Map

2 of 3 – Meadowbrook Parking Lot Naturalization – Asphalt Removal/Wetlands Creation Area – Before Construction

3 of 3 – Meadowbrook Parking Lot Naturalization – Asphalt Removal/Wetlands Creation Area – After Construction
PROJECT SITE
(Before Construction -- Winter 2011)

MEADOWBROOK PARKING LOT NATURALIZATION PROJECT
ASPHALT REMOVAL/WETLAND CREATION AREA

Map compiled by POOL Staff.
Information from MNCPPC.
This map intended for general public planning purposes only.
PROJECT SITE
(After Construction -- Winter 2018)

MEADOWBROOK PARKING LOT NATURALIZATION PROJECT
ASPHALT REMOVAL/WETLAND CREATION AREA