

5.0 SUMMARY AND RECOMMENDATIONS

This study identified a number of site-specific watershed restoration opportunities available to the County to protect and improve Ballenger Creek’s valuable water resources. While we have identified substantial opportunities for improvements at 15 Tier I sites, we consider this a preliminary prioritization (Table 5-1). We expect that the County will further refine these priorities and select from among these candidates based on additional factors and priorities that would influence successful implementation. As such, it is recommended that the County select a subset of high priority sites to pursue further through subsequent feasibility assessment(s) that would collect additional site-specific information, update ownership information and evaluate landowner cooperation, identify additional project constraints, further refine project approach and design, and determine if additional action is warranted for each high priority candidate site.

Opportunities for watershed improvement are not solely limited to these 15 Tier I sites because alternate avenues for implementation exist via the County’s Community Restoration partners. Many of the CR and Tier II opportunities (Tables 4-1 and 4-2) are ideally suited for implementation by these groups and organizations, which can often leverage additional public support, outside sources of funding, and other resources to put projects “on the ground.” Where possible, the County should lend support to these projects and programs.

Addressing stormwater management in karst area is an ongoing and important challenge in Ballenger Creek watershed, and elsewhere in the County. As discussed in more detail in Section 3-2, we recommend that Frederick County institute a karst overlay zone and develop specific, additional requirements that will guide development/redevelopment activities in these critical resource-sensitive areas.

Finally, we recommend that Frederick County use this list of candidate sites as a guide for selecting and implementing stormwater management and stream improvements. Because the County’s priorities may change and other opportunities arise over time, the County should be free to respond accordingly in order to encourage, collaborate, or require improvements at any of the 74 candidate sites, and not just those currently identified in the Tier I list.

| Site No. | Total Score (max. 100) | Location | Summary of Proposed Action | Total Planning Level Cost Estimate (\pm 30%) |
|----------|------------------------|--|--|---|
| 5-5 | 68 | Mainstem near Ballenger Cr. Trail loop | Natural stream channel design restoration of channel geometry and riparian buffer enhancement. | \$260,000 - \$630,000* |
| 2-11 | 64 | Pike Branch behind Ballenger Cr. Middle School | Establish hydrologic connections between wetland and stream. Construct off-line bioretention cells at end of 13 stormwater pipe outfalls. Retrofit existing stormwater pond. Remove invasive species and enhance riparian buffer. Build walking/biking path to better connect school and development. | \$833,000 |
| 5-2 | 60 | Ballenger Cr. Elem. Sch. - Reach 1 | Natural stream channel design restoration and riparian buffer enhancement. Restore outdoor classroom utility. | \$160,000 - \$420,000* |
| 5-10 | 60 | Ballenger Cr. Elem. Sch. - Reach 2 | Natural stream channel design restoration and riparian buffer enhancement. Replace streambank concrete lining at sewer line crossing. Remove debris jam and accumulated trash. | \$200,000 - \$490,000* |
| 2-2 | 57 | Ballenger Cr. Middle School | Build linear rain gardens along the shoulder of Ballenger Creek Pike. Create grass filter strips with infiltration trench, and rain gardens in parking lot islands/borders. Divert roof drainage to rain gardens behind school. Reduction of overall non-used field areas by conversion to tree stands/greenways. | \$92,000 |
| 4-1 | 54 | Ballenger Cr. Park | Incorporate linear rain gardens along entrance road. Create rain gardens and filter strips in northern parking lot islands/borders and rain gardens and infiltration trench in southern parking lot. Create rain garden at outfall below baseball fields. Reduce overall non-used lawn areas by conversion to tree stands/greenways. | \$144,000 |
| 5-1 | 53 | Ballenger Cr. Elem. School | Incorporate linear rain gardens between sidewalks and Kingsbrook Drive. Create rain gardens and infiltration trenches in parking lot islands/borders. Create rain gardens in planting beds in front of school and near asphalt play areas. Increase buffer/greenway between residential community and school grounds. | \$107,000 |
| 5-7 | 53 | Ballenger Cr. Trail - loop and parking area | Incorporate LID techniques into current park planning effort. Build off-line bioretention cells at three existing discharges from the adjacent residential community. Preserve existing trees in place. Depress open space areas slightly (e.g., 1 inch) and enhance soils to facilitate depression storage and infiltration. | \$113,000 |
| 6-3 | 49 | Adult Detention Center | Depress open space areas slightly (e.g., 1 inch) and enhance soils to facilitate depression storage and infiltration. Create infiltration trenches in parking areas. Develop linear rain gardens along road front in depression near entrance and in existing drainage swales. Add rain garden in a traffic island adjacent to the parking areas. | \$63,000 |
| 6-4 | 49 | Dept. Utilities & Solid Waste Mgmt. office | Replace culverts beneath parking lots and retrofit stormwater outfall with an off-line bioretention facility. Repair scour hole and restore intermittent channel. Incorporate linear rain gardens along Marcie's Choice Lane. Create rain gardens in parking lot islands/borders. Install green roofed carports in parking areas. | \$213,000 |
| 5-12 | 47 | Robin Meadows Subdivision | Build off-line bioretention gardens at 12 stormwater pipe outfalls within the subdivision and rain gardens at three other locations. Plant a wildflower meadow throughout the bottom of the wide swales. Stabilize the streambank where the flow from the central swale enters the stream, located near the end of Mallard Lane. | \$240,000 |
| 2-5 | 46 | Frederick Village Subdivision | Plant 50-foot wide riparian woodland buffer around pond and along streams. Plant wildflower meadows in open space. Build off-line bioretention cells at end of five stormwater pipe outfalls. | \$171,000 |
| 2-6 | 46 | Foxcroft II Subdivision | Plant wildflower meadows in open space. Build off-line bioretention cells at four stormwater outfalls. | \$69,000 |
| 2-1 | 44 | Orchard Grove Elem. School | Incorporate linear rain gardens along Hanover Drive. Create grass filter strips with infiltration trenches and rain gardens in parking lot islands/borders. Convert planting beds into rain gardens to receive redirected roof drainage. Install two rain gardens in lawn areas at stormdrain inlets. Increase buffer/greenway between residential community and school grounds. Include shade trees in parking areas. | \$190,000 |
| 5-9 | 44 | Ballenger Cr. Trail above New Design Rd. | Construct linear rain gardens along New Design Road and an off-line bioretention cell at a stormwater pipe outfall. Preserve existing trees and enhance the riparian buffer. Depress open space areas slightly (e.g., 1 inch) and enhance soils to facilitate depression storage and infiltration. | \$109,000 |

* Greater than 30% level of uncertainty due to complexity of site conditions; collection of additional data on site conditions and stressors will enable more refined cost estimates during future planning stages.

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APPENDIX

Public Workshop Presentation Materials



Public Workshop to Identify Watershed Restoration Opportunities in Ballenger Creek

April 21, 2005 – Ballenger Creek Elementary School

1. Introduction

- Project Team introductions
- Background: protection of watersheds in Frederick County
- Objectives for the meeting
- Objectives of the Ballenger Creek Watershed Study

2. Main Presentation

- Overview of current conditions within Ballenger Creek watershed
- Problems affecting streams in the watershed
- Solutions: types of opportunities for improvements
- How the public can help
- Introduction to the Problem and Opportunity Identification Exercise

3. Problem and Opportunity Identification Exercise

- Break out into several groups and gather around stations to discuss and suggest public ideas – watershed broken in 3 pieces – Eastern, Central, and Western
- Each station will have:
 - A large format map of a portion of Ballenger Creek watershed
 - Problem and Opportunity Identification cards to fill out; Project Team staff will plot location on map with the help of those making suggestions
 - Project Team staff with which to discuss problem areas, potential solutions, concerns, etc.

We Appreciate Your Participation!

Project Team:

*Frederick County,
Division of Public Works*
Shannon Moore
Kay Schultz

Versar, Inc.
Morris Perot Nancy Roth
Mike Klevenz Jennifer Shore

For periodic project updates and additional information on the County's efforts to preserve and protect clean water, visit the County's new web site:

www.co.frederick.md.us/NPDES/

Or, contact: Shannon Moore, Frederick County NPDES Program Coordinator, at (301)694-1413, or smoore@fredco-md.net.

Problem and Opportunity Identification Card

Suggestion No.: _____
(For County use only)

Ballenger Creek Watershed Restoration Study - 4/21/2005
Frederick County, MD

Location of Problem (address, street, nearest cross-street, property owner, etc.): _____

Description of Problem (sketch on back): _____

(Optional) Suggested Remedy: _____

(Optional) Please provide the following contact information should we have additional questions regarding your suggestion:

Name: _____

Phone: _____ Email: _____

Problem and Opportunity Identification Card

Suggestion No.: _____
(For County use only)

Ballenger Creek Watershed Restoration Study - 4/21/2005
Frederick County, MD

Location of Problem (address, street, nearest cross-street, property owner, etc.): _____

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