

Preliminary Design of an Interpretive Trail of Stormwater Management in a Piedmont Watershed

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(1) Introduction:

Increased construction and impervious surfaces on the University of Delaware Laird Campus has created challenges with stormwater runoff and pollution. In many cases, this rapid flow of water causes flooding, erosion, and contamination of water sources. In this study, a proposed plan for an interpretive trail in Fairfield Run was designed to highlight the environmental impacts of stormwater runoff on the area surrounding the university.

(2) Objectives:

The objective of this study was to examine Fairfield Run, located in the Piedmont Watershed of the University of Delaware Laird Campus.

- 1) *Design a preliminary plan for an interpretive trail* – Design a trail to encompass the major gullies, highlighting the negative impacts of stormwater on campus.
- 2) *Spread greater awareness about stormwater watershed management* – Educate the public about stormwater management in relation to runoff, water pollution, and various environment impacts.
- 3) *Provide increased recreational opportunities* – Create additional walking and running trails in order to promote healthy activities outdoors.



This interpretive trail design creates a route intertwining with various viewpoints, ultimately to increase awareness and educational output.

(3) Methods:

- 1) **Conducted a survey in relation to stormwater runoff on campus** .
 - Encouraged University of Delaware students to participate in a 10-question survey in order to better understand the opinions and knowledge of current students.
- 2) **Designed a preliminary trail using Geographic Information Systems (GIS) and Google Earth in accordance to the U.S. National Park Service and U.S Forest Service Criteria:**
 - The 10% Guideline** – Trail grade must be less than 10% in order to maintain tread stability and avoid erosion. Unsustainable trail grade will induce water management problems.
 - Signage** – Trail signage provides points of interest, guidance, and safety features along the length of the trail.
 - Safety** – Provide protection from natural hazards and conduct regular inspections of the premises, in order to ensure public safety.

3) Chose specific locations for signage along the trail design.

- Identified points of interest along the trail to highlight gullies, stormwater runoff, and forest quality.
- This trail design primarily features the gullies, drawing attention to the environmental impacts of such landforms.

(4) Results:

Trail Design:

The interpretive trail design complied with the criteria of the U.S. National Park Service and the U.S. Forest Service. For The 10% Guideline, GIS was utilized to ensure that the slope did not exceed 10% (Figure 1). Points of interest along the length of the trail were identified for signage (Figure 2), featuring various landscapes. The trail design addresses safety concerns, avoiding steep and eroding gullies. The gullies, however, are incorporated into the trail design to increase awareness about stormwater runoff and environmental issues.

Survey Findings:

How likely are you to read environmental education signage in local parks/public places?

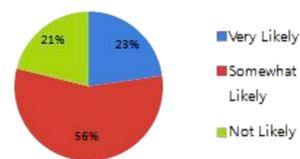


Figure 1: GIS map of the slopes of Fairfield Run to allow for the most compatible placement of the trail.



Left: Megan Shaffer and young volunteers
Right: Trash collected at the Christina River Watershed Clean Up, including chairs and a rusty dryer



Figure 2: Preliminary plan for interpretive trail through Fairfield Run, where numbered triangles represent locations of educational signage.

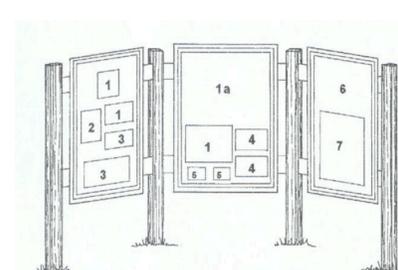
(5) Recommendations:

Trail Maintenance (continuous process immediately following trail construction)

- Goals: provide access that is safe and convenient for users, protect surrounding resources, preserve trail investment.
- Preliminary work: recruit a trail crew, and conduct trail assessment and inventory. Ongoing upkeep: vegetation, signage, tread, structure, drainage, litter removal.
- Frequency: approximately 3 times per year.

Benefits of Trail Signage:

- Efficiently allows users leave the trails with a positive impression.
- Educates users about natural features of the trail.
- Promotes the protection of natural resources and the environment.



Left: Gully known as the 'Grand Canyon.'
Center: Example of 3-panel display arrangement.
Right: Signage on Laird Campus implemented by UD, illustrating sustainable landscapes modeled by rain gardens.

References:

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