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USING GIS FOR PRIORITIZATION IN SUBWATERSHED RESTORATION

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ABSTRACT: Geographic Information Systems (GIS) has been incorporated throughout watershed management. An area in which GIS' benefits continue to evolve is through analysis. This project focuses on GIS analysis conceptually and specifically as applied to restoration efforts in a typical suburban subwatershed. Specifically, this project evaluates a small 303(d)-listed subwatershed, Black Creek, in Cary, NC. The watershed assessment indicates stormwater-related degradation. The subwatershed is largely built out, primarily developed under legacy stormwater regulations that focused on collecting and funneling stormwater downstream to minimize local flooding. Though more modern stormwater regulations requiring local stormwater retention now exist, the issues created by legacy stormwater practices remain. It is not advisable or realistic to completely overhaul the existing stormwater infrastructure; however, some stormwater retrofits are necessary to restore this subwatershed's water quality. For this project, GIS analysis and tools were used to aid subwatershed prioritization efforts. To begin this process, a delineation between locally applicable legacy and modern stormwater regulations is established. Subwatersheds with larger percentages of legacy stormwater infrastructure are given higher priority for retrofit activities. Second, a stormwater retrofit goal is established based on relevant ecosystem standards and the generalized Impervious Cover Model. The result is a target acreage for treatment, isolation, or disconnection, similar to the Impervious Cover TMDL established for Eagleville Brook in Mansfield, MA. Third, GIS is used to help identify and prioritize potential restoration sites. Conceptually, as many subwatersheds face comparable situations, similar efforts could be applied. In today's economy, it is increasingly important to continually consider new and innovative ways to best utilize limited natural and financial resources. Though a detailed financial analysis is beyond the scope of this project, this study does consider how GIS can be used to select highly beneficial restoration sites, reduce field site visits to areas already developed with modern stormwater practices, and to provide additional relevant data for site comparisons.

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