

# CENTENNIAL AND WILDE LAKE WATERSHED RESTORATION PLAN

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Submitted by

CENTER FOR  
WATERSHED  
PROTECTION



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for the Howard County Department of Public Works

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## **EXECUTIVE SUMMARY**

### **BACKGROUND**

This watershed management plan provides a summary of the recommendations for the Centennial and Wilde Lake watersheds from a baseline analysis, stream assessment, upland pollution prevention, and retrofit fieldwork and stakeholder process. Specific watershed management plan priorities and accompanying maps specifying locations for restoration activities have been drafted. The subwatershed maps in Section 4 serve as a blueprint for the protection and restoration of the two lakes and may be used as planning maps during the implementation of the watershed management plans.

Centennial and Wilde Lakes are very different in terms of the level of watershed development and land use characteristics. The Centennial Lake watershed is 3.5 square miles and has its largest single land use in agriculture even though a similar portion of the watershed is composed of low-density residential development and forested land. Residential development has occurred from the 1970s to the present day, with much of the development occurring in the last 15 years. Based on existing zoning and with significant parcels of protected farmland, the watershed is approaching build-out. Wilde Lake watershed is 1.9 square miles and is almost fully built-out with most of the development occurring in the 1970s. Its development is primarily residential with some commercial, public schools, and active recreation parks. The two watersheds generally have forested riparian corridors though there are some notable areas for improvement in both watersheds.

Impervious cover is an indicator of the extent and pattern of growth in the watershed and can be used with other supporting data to develop appropriate restoration strategies for a watershed. Currently, the Centennial Lake watershed is approximately 9% impervious cover and is expected to increase to 10% impervious cover in the future based on zoning and full build-out. The Wilde Lake watershed is approximately 32% impervious cover and based on zoning is fully built out. The existing impervious cover levels have a considerable effect on the conditions in the streams in the two watersheds. In the Centennial Lake watershed, stream habitat scores generally rated in the good to excellent range, whereas in Wilde Lake the stream habitat scores were mostly poor. This is strongly related to the altered hydrology that occurs in watersheds with relatively high levels of impervious cover. Prior research has shown that stream and wetland quality begins to decline when the amount of impervious cover in a watershed approaches 10%. Based on the estimates, Centennial Lake is approaching this threshold and Wilde Lake has moved far beyond it.

The principal effects of impervious cover in Centennial and Wilde Lake include:

- Changes in hydrology of streams, wetlands and floodplains
- Increased pollutant loads delivered in urban stormwater (bacteria, sediment, nutrients)
- Channel erosion in headwater streams resulting in sediment transport to the Lakes
- Establishment of invasive plant species in response to hydrologic and land use disturbance

## **PUBLIC PARTICIPATION**

Watershed residents and other stakeholders have played a vital role in the creation of this watershed management plan. It is important to involve the citizens, businesses, and other interested parties in the development of a watershed plan, since they will live with the decisions that are made. The stakeholders also brought to the table the issues that are important to them. Their participation gives them a say in the outcome and helps to ensure plan implementation. Two public meetings were held with watershed stakeholders; the first covered the baseline assessment and fieldwork, which was performed by the Center, Tetra Tech and the County, and asked stakeholders to participate in setting goals and objectives for the watersheds. The second stakeholder meeting engaged participants in the recommendations and developed feedback on conceptual projects for implementation in the watershed. The overall watershed protection and restoration goals and objectives identified by the stakeholders in the first meeting are summarized below: There were 11 primary goals identified by participants and these goals are echoed throughout the priority recommendations. The 11 goals are as follows:

- 1. Broaden public education and outreach and improve its effectiveness**
  - a. Get more people involved
  - b. Figure out public "hot button issues"
  - c. Provide more mass mailings with educational appeal
  - d. Establish a "Green" web site, or just "links" to other good sites
- 2. Prioritize projects that will have the largest beneficial impact on the lakes**
- 3. Work with the schools and youth on education and demonstration projects**
  - a. Pursue demonstration projects on school grounds—biofilters, etc.
  - b. Use public service requirements for projects such as buffer plantings, rain barrels, and rain gardens
- 4. Target lawn care and make resources available to homeowners**
  - a. Work with major lawn service providers and use enforcement if necessary
  - b. Provide lawn care education and soil sampling to encourage fall applications
- 5. Develop innovative funding mechanisms**
  - a. Establish a Green Fund for demonstration projects, native plantings, signage, etc.
- 6. Improve riparian buffer management around lakes and streams**
  - a. Reduce invasive plants
- 7. Pursue demonstration projects**
  - a. Incorporate rain gardens into traffic-calming measures
  - b. Use permeable pavers in parking areas
  - c. Create rain gardens in residential yards
- 8. Improve coordination between local agencies and important organizations and stakeholders in the watershed**
  - a. County Department of Recreation and Parks, the Board of Education, the Department of Public Works, Howard Conservancy, Columbia Association, Howard County Master Gardeners, and Little Patuxent Watershed Association



**9. Address stormwater runoff**

- a. Reduce runoff volume and address untreated runoff draining to the lakes
- b. Incorporate retrofits such as bioretention into the Department of Recreation and Parks' long-term Master Plan for Parks
- c. Build in long-term maintenance

**10. Follow an action-oriented process**

- a. Develop a list of action items for eventual implementation
- b. Use modeling to help determine the most important actions to address the key problems

**11. Identify existing problems and set restoration goals**

**PROCESS**

The Centennial and Wilde Lake watersheds were chosen for study as a result of a prioritization process that was initiated in response to EPA's National Pollutant Discharge Elimination Service (NPDES) Phase I requirements set by Maryland Department of the Environment. Current and future impervious cover was estimated for the watersheds in order to set expectations for current and future water quality and habitat conditions. The Centennial and Wilde Lake watersheds were chosen because they drain to important recreational resource areas, are in the Patuxent watershed and represent areas in both Columbia and Ellicott City. Previous studies were examined to help understand baseline conditions in the watersheds and assessments were performed in the stream corridors, upland areas for pollution source areas and stormwater retrofits to treat stormwater runoff. Draft goals were created for the watersheds based on our scientific assessment of the watershed, stakeholder input and the existing and potential future land use.

Prioritized implementation recommendations for the Centennial and Wilde Lake watersheds from Section 4 are summarized below. Preliminary estimates of the benefit and expected cost of restoration efforts have been identified so that financial resources can be allocated and staff roles defined. Successful watershed restoration requires a multi-faceted approach that combines on-the-ground implementation, strong partnerships, public education, and protection of watershed function. Long-term protection of water quality, fisheries, and quality of life have quantifiable community benefits including increased property values and enhanced quality of life, which compound over time.

Another key component of this watershed plan is measuring and monitoring the success of the plan. In Centennial and Wilde Lake, this consists of the County efforts to track the implementation of management measures, monitoring the benefits to stream channel stability, and water quality. This will enable county staff to learn from the successes and challenges of plan implementation and craft better strategies in the future.

***Centennial Lake Watershed Priority Recommendations***

In the Centennial Lake watershed, there is a focus on both protection of existing resources and reduction of impacts from individual landowners, institutional uses, and resident geese as well as improvement of areas identified as either lacking stormwater treatment or subject to channel instability due to stream channel incision (downcutting) and non-native plant species.



The following bullets summarize the recommended restoration and protection efforts detailed in Section 4 of the report and Appendix A.

- Restore over 1 mile of forested stream through two floodplain reconnection sites and a series of stream buffer restoration projects
- Create an additional 10 to 12 acres of forested wetlands by implementing two floodplain reconnection sites
- Manage an additional 18 plus acres of impervious cover currently untreated for stormwater by implementing 8 retrofits identified in Section 4
- Establish successful partnerships with schools, the Little Patuxent Watershed Association, county agencies, Howard County Master Gardeners and others to implement restoration and education projects
- Minimize the impact of resident geese in the watershed
- Create ½ acre of native gardens around Centennial Lake to discourage resident geese
- Establish a County Sustainability Program, that includes public participation, to reduce potential pollution from County facilities and maintenance shops, and to investigate pollution prevention alternatives to the use of caustic road salts, pesticides, and herbicides at public facilities
- Coordinate conservation efforts for remaining large developable agricultural parcels
- Work with watershed partners to reach a significant number of watershed residents through a series of mediums with targeted educational messages. The mediums used at a minimum should include newspaper articles, outreach to homeowners' associations, signage at demonstration projects and incorporation of students and school curriculum in the schools into restoration projects.
- Leverage state and federal restoration resources as well as resources available to non-profit, and other County agencies to stretch limited restoration resources.
- Ensure long-term maintenance, such as the existing County stormwater maintenance program, is in place for restoration projects

Based on a preliminary modeling run using the Watershed Treatment Model (Caraco, 2001), the efforts are expected to result in approximately 15 to 20% reduction in known sources of phosphorus and sediment (Appendix G) and are expected to cost approximately 1 million dollars (Section 4) over a 5- to 10-year targeted implementation window.

### ***Wilde Lake Watershed Priority Recommendations***

In the Wilde Lake watershed, the focus is on reducing the impact of an altered hydrology resulting from an area developed primarily without stormwater management or with much older technology. Stormwater retrofits and stream restoration are two of the prescriptive methods to achieve an improvement in sediment and nutrient transport in the watershed. Source reduction is also an important factor in this watershed due to the high percentage of turf area and presence of resident geese.

The following bullets summarize the recommended restoration efforts detailed in Section 4 of the report and Appendix A.

- Manage an additional 40 to 50 acres of untreated or poorly treated impervious area through the implementation of 15 to 20 priority retrofits (Section 4)
- Restore/rehabilitate at least ½ mile of unstable streams through the implementation of up to 5 priority projects
- Minimize the impact of resident geese on Wilde Lake and the Beaverbrook ponds
- Reach a significant number of watershed residents through a series of mediums with targeted educational messages. The mediums used should include, at a minimum, newspaper articles, homeowners' associations, signage at demonstration projects, and through the schools.
- Investigate several potential illicit discharges in the watershed and encourage neighbors to keep an eye on conditions at outfalls
- Perform trash cleanups with the community
- Ensure long-term maintenance, such as the existing County stormwater maintenance program, is in place for restoration projects
- Leverage state and federal restoration resources, as well as resources available to non-profit and other County agencies, to stretch limited restoration resources.

Based on a preliminary modeling run using the Watershed Treatment Model (WTM) (Caraco, 2001), the efforts are expected to result in an approximately 15 to 20% reduction in known sources of phosphorus and a 20 to 25% reduction in known sources of sediment. Implementation costs are expected to be approximately 3 million dollars (Appendix G).