

The Watershed Protection Plan for the City of Durham's Water Supplies identifies parcels in the City's water supply watersheds that if protected will help to protect the water quality of the City's water supplies. Parcels identified in the Watershed Protection Plan would be considered eligible for conservation easements or acquisition partially or wholly funded by the City of Durham. The Plan includes:

1. A Geographic Information System (GIS) model for identifying and prioritizing parcels or portions of parcels that contribute significantly to the protection of the City's water supply water quality.
2. A process for recommending conservation easements or fee simple acquisitions to City Council, using the City's funding already dedicated to land conservation for water supply protection.

The Department of Water Management worked with the Triangle Land Conservancy to create a new GIS model based on the Upper Neuse Clean Water Initiative (UNCWI) model. Recently, an updated watershed protection model was developed for UNCWI that identifies more than 260,000 acres of priority area for conservation in the Upper Neuse Basin. This prioritization included the Flat River and Little River watersheds, both of which are in the Upper Neuse River Basin, but the underlying goals, criteria, and data were chosen specifically for the protection of Raleigh's drinking water resources.

The GIS model for the Department of Water Management is focused on identifying and prioritizing land in the Flat River and Little River watersheds that is most valuable for protecting water quality in Lake Michie and Little River Reservoir. The Department convened a Technical Advisory Team to guide the model development and a Stakeholder Advisory Group to inform the model's goals, objectives and weights.

The Watershed Protection Plan includes partnering with UNCWI, which is a collaboration among local governments and land conservation organizations to protect land that contributes to the preservation of clean drinking water in the Upper Neuse River Basin. Collaboration with UNCWI facilitates the City's land conservation program by leveraging UNCWI's existing GIS model, by leveraging the land conservation organizations' land stewardship programs (conservation easement monitoring, maintenance and enforcement), and by extending the City's land conservation efforts beyond Durham County (the majority of the land area in the Lake Michie and Little River Reservoir watersheds is outside of Durham County).

The Watershed Protection Plan was approved by City Council on April 17, 2017. The Agreement for Watershed Protection between the City of Durham and the Conservation Trust for North Carolina was executed on May 4, 2017. We are now coordinating with UNCWI and the land trust organizations and attending the UNCWI Watershed Protection Review Board meetings.

1. Effectiveness

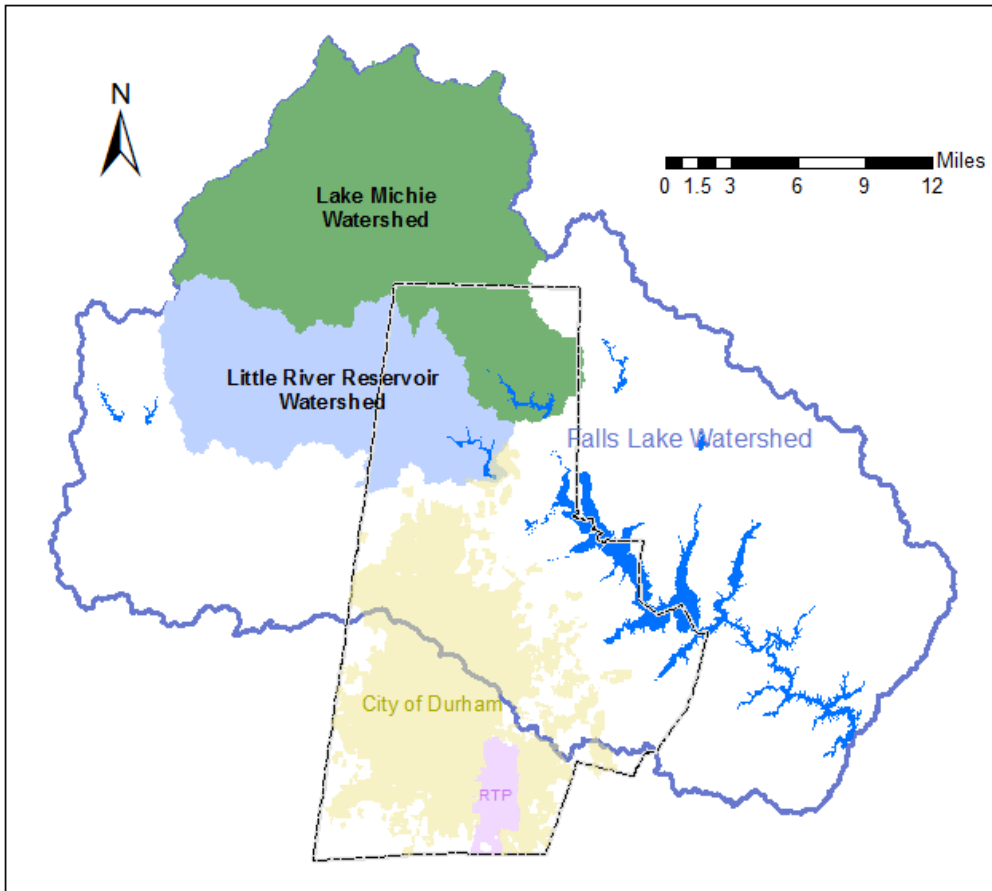
- A. The Watershed Protection Plan for the City of Durham's Water Supplies will have a significant overall benefit to drinking water sources in N.C. (quality and quantity).

The City of Durham's drinking water is regularly sourced from Lake Michie (in the Flat River watershed) and Little River Reservoir (in the Little River watershed); both watersheds lie within the Falls Lake Watershed, also known as the Upper Neuse River Basin. Lake Michie could be expanded in the future to meet the needs of a larger population and the City has been purchasing the land immediately surrounding the Lake to that end. The Department of Water Management's approach to land acquisition has been passive; the Department has pursued purchasing a property when an interested property owner adjacent to Lake Michie has contacted the Department.

The City is interested in protecting additional land in the Flat River and Little River watersheds in order to protect Durham's supply of high-quality drinking water. The most economical way to protect the City's source water is to purchase conservation easements on properties within the water supply watersheds that contain riparian buffers. While any opportunity to purchase land adjacent to Lake Michie would clearly satisfy the purpose of future water supply, not all opportunities to purchase a conservation easement would offer equal protection of the City's water supply.

An additional way to maximize the City's investment is to work in partnership with the Upper Neuse Clean Water Initiative (UNCWI). UNCWI, established in 2005, is a collaboration among local governments and land conservation organizations to protect land that contributes to the preservation of clean drinking water in the Upper Neuse River Basin. Collaboration with UNCWI facilitates the City's land conservation program by leveraging UNCWI's existing GIS model, by leveraging the land conservation organizations' land stewardship programs (conservation easement monitoring, maintenance and enforcement), and by extending the City's land conservation efforts beyond Durham County (the majority of the land area in the Lake Michie and Little River Reservoir watersheds is outside of Durham County). See Figure 1.

Figure 1. Durham Water Supply Watersheds and Falls Lake Watershed



The Department of Water Management’s Watershed Protection Plan identifies parcels in the City’s water supply watersheds that if protected will help to protect the water quality of the City’s water supplies. Parcels identified in the Watershed Protection Plan would be considered eligible for conservation easements or acquisition partially or wholly funded by the City of Durham. The Plan includes:

1. A Geographic Information System (GIS) model for identifying and prioritizing parcels or portions of parcels that contribute significantly to the protection of the City’s water supply water quality. See Figure 2 on page 3.
2. A process for recommending conservation easements or fee simple acquisitions to City Council, using the City’s funding already dedicated to land conservation for water supply protection. See Figure 3 on page 4.

Figure 2. GIS Model

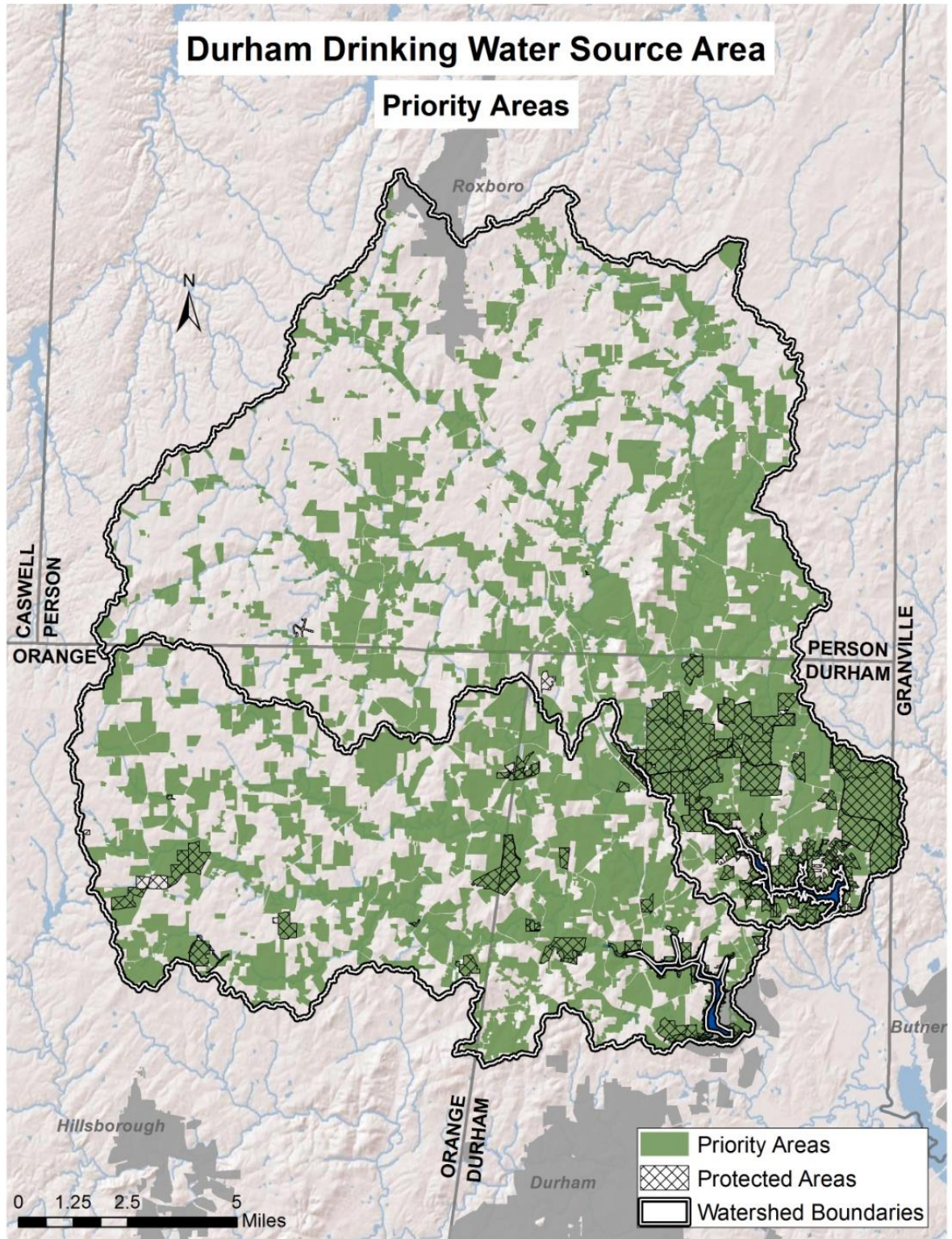
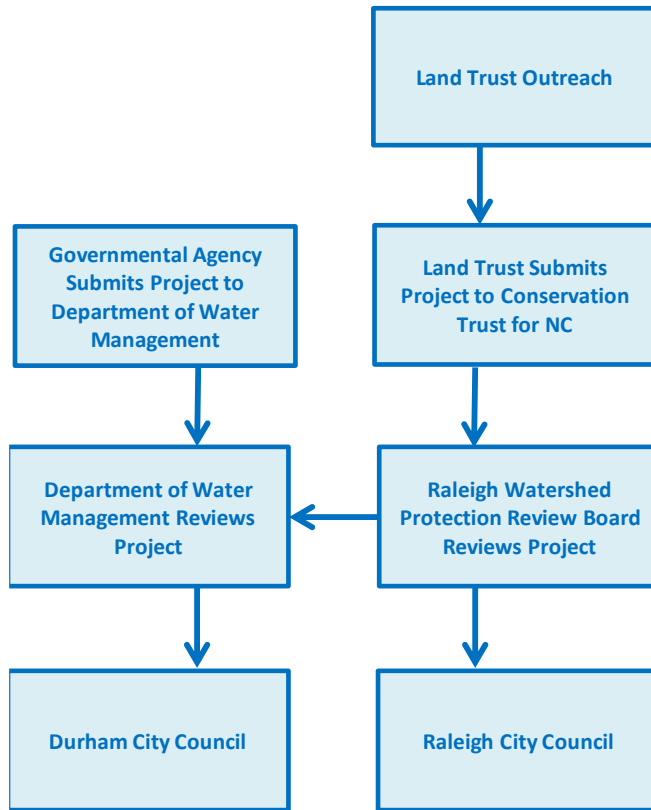


Figure 3. Process



- B. The Watershed Protection Plan for the City of Durham’s Water Supplies has a mechanism in place for obtaining measurable results.

We will determine progress by the amount of stream length protected and the number and area of priority parcels protected. Data included in the project applications submitted to the UNCWI Watershed Protection Review Board and to the Department of Water Management are: stream feet (length of center line of stream protected), linear feet of buffer protected (each side of the stream that is protected), average width of buffer protected, acres of buffer protected, and development potential (% of property that could feasibly be developed). See the Department of Water Management Project Application Summary on pages 8-10.

- C. The Watershed Protection Plan for the City of Durham’s Water Supplies demonstrates effective and efficient use of resources.

The program includes leveraging the City’s money with land conservation organization funding, City of Raleigh funding, and other funding. Further, we leverage funding by focusing on conservation easements rather than fee simple purchase for properties not adjacent to the City’s water supply reservoirs.

Collaboration

- A. The Watershed Protection Plan for the City of Durham’s Water Supplies involves strong and appropriate project partnerships.

We are partnering with the Upper Neuse Clean Water Initiative¹, which includes the City of Raleigh, Conservation Trust for North Carolina (coordinator), Ellerbe Creek Watershed Association, Eno River Association, Tar River Land Conservancy, Triangle Greenways Council, Triangle Land Conservancy, and The Conservation Fund.

- B. The Watershed Protection Plan for the City of Durham’s Water Supplies included an element of community involvement.

We involved many stakeholders in the development of the criteria and standards used in the GIS model for prioritizing parcels for protection.

Jennifer Brooks	Durham County Soil and Water Conservation
Ed Buchan	City of Raleigh
Caitlin Burke	Conservation Trust for North Carolina
Vickie Dudick	North Carolina National Guard
Derek Halberg	Tar River Land Conservancy
Bo Howes	Triangle Land Conservancy
Jane Korest	Durham County Open Space
Jordan Law	North Carolina National Guard
Kim Livingston	Eno River Association
Sydney Miller	City of Durham Department of Water Management
Lori Montgomery	City of Durham Department of Water Management
Braden Ramage	North Carolina National Guard
Hannah Rank	Tar River Land Conservancy
Mahima Rao	Ellerbe Creek Watershed Association
Mike Schlegel	Triangle J Council of Governments
Mike Stec	City of Durham Department of Water Management
Laura Stroud	Triangle Land Conservancy
Sandra Wilbur	City of Durham Public Works

Relevance

- A. There is a strong, explicit connection between the Watershed Protection Plan for the City of Durham’s Water Supplies and source water protection.

“The best means for ensuring high-quality drinking water for public consumption is to use a multiple-barrier approach” such as “treating the water and maintaining quality

¹ <https://www.ctnc.org/assist/upper-neuse-clean-water-initiative>

in the distribution system” against threats.² Protecting source water quality is another of these barriers. Land acquisition and stream buffers were recommended as a means of protecting Durham’s source water in a 1989 watershed management study for Lake Michie and Little River Reservoir.³

- B. The Watershed Protection Plan for the City of Durham’s Water Supplies addresses known issues (e.g. community concern, impairment, etc.).

There is widespread public concern about source water contamination. Reference the recent Gen X contamination concern. There are also repeated public media articles and stories about emerging contaminants, in general.

Sustainability

- A. There is a high likelihood of the Watershed Protection Plan for the City of Durham’s Water Supplies being implemented and, eventually, being completed.

The Watershed Protection Plan was approved by City Council on April 17, 2017. The Agreement for Watershed Protection between the City of Durham and the Conservation Trust for North Carolina was executed on May 4, 2017. We are now coordinating with UNCWI and the land trust organizations and attending the UNCWI Watershed Protection Review Board meetings (July 13, 2017 and September 28, 2017).

Furthermore, there are two funding mechanisms in place for the program. Conservation easements approved for acquisition by City Council would be funded from the City’s “Future Water Supply/Source Protection” CIP Project, which is funded by \$0.01/CCF water and sewer utility billing (generating ~\$100,000/ year) and from annual appropriations to the CIP (historically \$500,000 per year).

- B. The Watershed Protection Plan for the City of Durham’s Water Supplies goes above and beyond meeting existing regulations, guidelines or practices.

There is no regulatory requirement to implement this kind of watershed protection program.

² Richard W. Gullick, “Source water protection: Perspectives of the past, present, and future,” *Journal - American Water Works Association*, 106:8 (August 2014), p. 164.

³ Camp Dresser & McKee, *Watershed Management Study: Lake Michie and Little River Reservoir Watersheds* (June 1989), pp. 14 and 23.

Innovation

- A. The Watershed Protection Plan for the City of Durham's Water Supplies is innovative and creative.

We have joined the Upper Neuse Clean Water Initiative bandwagon, recognized as a model program nationwide. Not only does our program leverage funding by joining the UNCWI, we were able to work with the Triangle Land Conservancy in developing our GIS model.

- B. The Watershed Protection Plan for the City of Durham's Water Supplies addresses multiple interests and objectives.

Our Watershed Protection Plan protects our water supply quality and quantity, addresses potential erosion and sedimentation, addresses natural wildlife corridors, and addresses open space protection. Our Plan is consistent with the Little River Corridor Open Space Plan.⁴

Transferability

- A. The City of Durham Department of Water Management has performed outreach activities.

We work with the Upper Neuse Clean Water Initiative and the Conservation Trust for North Carolina performs outreach to land trust organizations and the public as part of their responsibilities under that program. Furthermore, the Department of Water Management has given presentations to the general public (e.g., Creek Week Lunch & Learn on March 22, 2017) about the City's Watershed Protection Plan.

- B. The Watershed Protection Plan for the City of Durham's Water Supplies is highly transferable.

The City's watershed protection program was itself transferred from the Upper Neuse Clean Water Initiative. Furthermore, the City has already participated in an NC AWWA-WEA webinar to water resources professionals in promoting the program (NCAWWA-WEA Water Resources Committee webinar on August 17, 2017).

⁴ Adopted by the Durham Board of County Commissioners on August 27, 2001 and the Durham City Council on November 19, 2001.

**City of Durham Water Supply Watershed Protection
Project Application Summary**

APPLICANT INFORMATION

Date	
Organization Name & Address	
Contact Person and Title	
Phone number	
Email address	

PROJECT INFORMATION

Project Name	
Project location (including county, and above which Durham reservoir)	
Durham Watershed Protection model score	

PROJECT PARAMETERS

Protection method (easement or fee simple; <i>please note future owner if fee simple</i>)	
Acres	
Stream feet (length of center line of stream protected)	
Linear feet of buffer protected (count each side of the stream that is protected)	
Average width of buffer protected	
Acres of buffer protected	

PROJECT PARAMETERS CONTINUED

Development potential (% of property that could feasibly be developed)	
Threats/Urgency to protect the Property Please select the option below that best describes the threat to the property. ----- <input type="checkbox"/> Imminent – property is on the market or expected to be altered in a way that negatively impacts the resource in the immediate future <input type="checkbox"/> Emerging – Area is rapidly developing or expected to be altered in a way that negatively impacts the resource in the near future <input type="checkbox"/> Not threatened If threatened, please elaborate on the source of the threat in the space below:	
Adjacent protected areas (if applicable) -----	
Public benefits -----	

PROJECT FUNDING

Durham Funding Request	\$
Cost/stream foot for Durham portion of project	\$
UNCWI Funding Request	\$
Cost/stream foot for UNCWI portion of project	\$
Funding Partners (list all partners and expected match)	
.....	

PROJECT STATUS

Project status What is the current status of the project?	
.....	
Projected closing date	