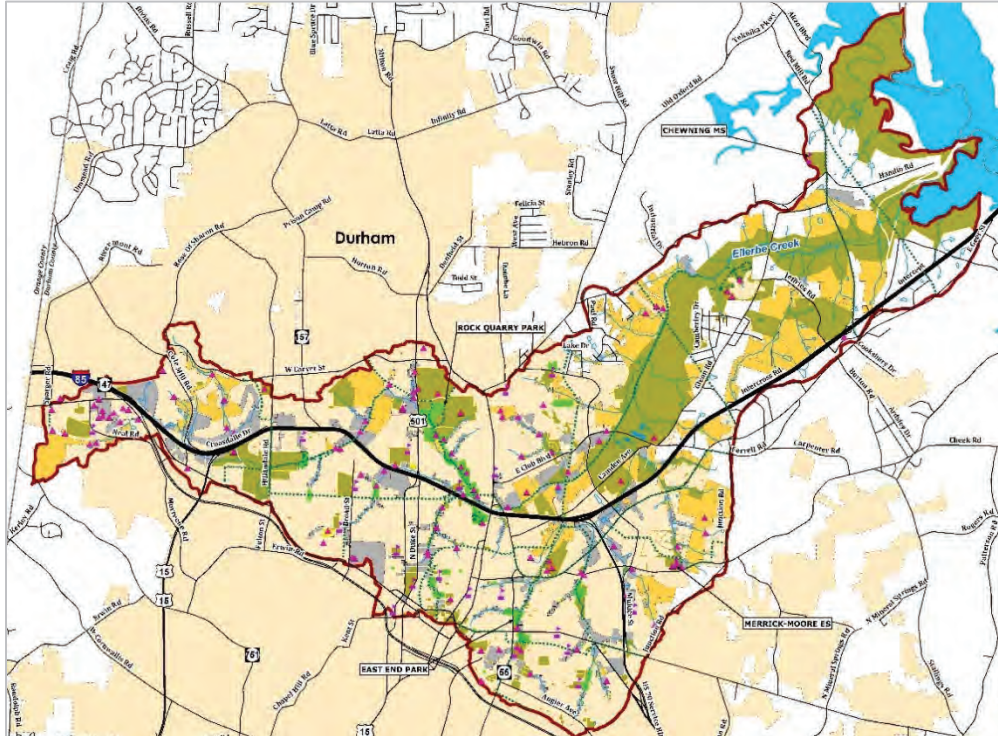


CITY OF DURHAM
Critical Areas Protection Plan

UPDATED:
March 2021



PREPARED FOR:



City of Durham Public Works Department
Stormwater and GIS Services Division

101 City Hall Plaza
Durham, North Carolina 27701

**CITY-WIDE
Critical Areas Protection Plan**

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1.0 Introduction

The City of Durham Department of Public Works, Stormwater and GIS Services Division (City) implemented their watershed planning program in 2007 to protect and improve the water quality of streams, ponds, and small lakes in Durham's watersheds and to comply with water quality regulations instituted by the State of North Carolina to improve and protect the rivers and water-supply reservoirs to which they flow. To date, the City has completed or is in the process of completing a Watershed Improvement Plan (WIP) for seven of the City's major watersheds: Ellerbe Creek (2010), Third Fork Creek (2012), Crooked Creek (2013), Northeast Creek (2013), Little Lick Creek (2015), Eno River (2018), New Hope Creek (ongoing), and Little Creek (ongoing). Each of the watershed plans were completed in different years and a current evaluation of parcel availability should be completed prior to using this document. For each of these watersheds, the WIP assessed existing water quality and stream health, identified sources of pollution or conditions that can negatively affect water quality and stream conditions, and selected and prioritized the most cost-effective projects or actions the City can implement to reduce pollution and improve watershed health.

One important component of each WIP is identification of high-quality riparian buffers that are currently privately owned that could be preserved and protected. Riparian buffers are the vegetated areas directly adjacent to streams, rivers, and ponds. High-quality riparian buffers consist of a mixture of native trees, shrubs, and grasses that serve several important functions in a healthy watershed:

- Naturally infiltrate, slow down, and clean stormwater runoff, helping to prevent pollutants such as sediment, nitrogen, phosphorus, and pesticides from reaching our streams
- Deep-rooted native trees and shrubs help protect stream banks, reducing erosion and sediment during moderate to severe floods
- Increase biodiversity by providing food and habitat for native animals and plants
- Provide shade, which helps keep water temperatures cooler for fish and aquatic insects
- Help to slow floodwaters, which can help protect downstream property
- Offer places for nature study, public education, and wildlife observation
- Provide natural screens and noise control
- Require less use of fertilizer, irrigation water, and weed killer than manicured lawns and landscaping

Preserving existing, high-quality riparian buffers protects these benefits. In addition, the Upper Neuse River Basin Association (UNRBA) has developed *Design Specifications and Nutrient Accounting for Land Conservation* guidelines, which outlines the practice of land conservation, provides guidance for design criteria and implementation specifications, and nutrient credit assignments for forest land conservation (<https://unrba.org/nutrient-credit-program>). If these nutrient reduction credits are approved by the NC Department of Environmental Quality (NCDEQ) – Division of Water Resources (DWR) (submitted for DWR review on 10/28/16), implementation of the Critical Areas Protection Plan (CAPP) may generate nutrient credits for the City of Durham that can be applied to the Falls Lake and Jordan Lake Nutrient Management Strategies. Currently, the City does not have a program to purchase parcels recommended for conservation through the CAPPs. State-approved nutrient practices and crediting can be found here: <https://deq.nc.gov/about/divisions/water-resources/planning/nonpoint-source-management/nutrient-offset-information>.

Similarly, Jordan Lake One Water (JLOW) is in the process of developing an integrated watershed management approach for the Jordan Lake watershed, which includes the New Hope Creek and Little Creek watersheds. The JLOW workplan will be part of the Jordan Lake Nutrient Management Strategy

Rules Readoption opportunity, and the land conservation recommendations made in the CAPPs for the New Hope Creek and Little Creek watersheds (Appendices G and H of this document) could be adopted into this workplan.

To help accomplish the goal of preserving riparian buffers, the City prepared a CAPP as a component of each WIP to identify privately owned parcels with high-quality riparian buffers that could be prioritized for conservation or protection to preserve these benefits to water quality and watershed health. Initially, the City developed a separate CAPP for each watershed. In May 2016, a City-wide CAPP was prepared that combined each of the watershed-specific recommendations into one City-wide CAPP. The City-wide CAPP was updated in 2017 to include a watershed-specific CAPP for the Eno River (Appendix F) and again in 2020-2021 to include a CAPP for New Hope Creek (Appendix G) and Little Creek (Appendix H). The information contained in the Eno River, New Hope Creek, and Little Creek watershed CAPPs is based upon 2017-2020 data; however, one limitation of this document is that the data presented for other watersheds (Ellerbe Creek, Third Fork Creek, Northeast Creek, Crooked Creek, and Little Lick Creek) relies on the previously prepared data presented in older documents. Parcels recommended in earlier CAPPs may have been developed, acquired for development, or acquired by the City. Therefore, it is important that users of this document verify that the parcel data and watershed maps are up-to-date and reflect existing conditions.

A separate document, the Riparian Area Management Plan (RAMP), addresses the management practices for streams and riparian buffers on City-owned and maintained land.

The first step to identify CAPP sites was to establish the site selection criteria presented in Section 2. The development of the site selection criteria, which are focused primarily on water quality, was guided by documents from the City, County, State, and regional planning sources; information collected by local watershed groups; watershed characterization and assessment reports; and professional experience. These resources shaped the site selection criteria and provided insights into the specific problems and priorities within each watershed. Land conservation and protection plans and the North Carolina Natural Heritage Program's (NCNHP) Conservation Planning Tool were also reviewed for any methods, procedures, or spatial data procedures they might offer. Other documents used to help establish site selection criteria are discussed in Section 2.1.

The second step was to locate and evaluate potential CAPP sites with the site selection criteria using a geographic information system (GIS) and data including tax parcel data, aerial photography, hydrology, topography, land use/land cover data, sanitary sewer line and greenway corridor mapping, wetland inventory data, and floodplain mapping layers. Based on the results of the GIS analyses, each potential CAPP site received a prioritization score based on the total score from the site selection criteria. The GIS analysis and site evaluation process are discussed in more detail in Section 2.2.

Finally, to qualify as a recommended CAPP site, a parcel must meet two key requirements:

1. Obtain a high prioritization score based on its individual parcel attributes
2. Have the ability to serve as a keystone property around which larger protected corridors or areas might be built in the coming years

The goal of the CAPP is not to create isolated protected areas throughout each watershed, but rather to establish a network of protected sites. Scoring results for each potential CAPP parcel and the recommended CAPP parcels for each watershed that has been completed are presented in the appendices.

2.0 Site Selection Criteria and GIS Analysis

Determining site selection criteria began with a review of existing site characteristics available in a GIS-compatible data format along with studies and plans related to watershed planning, land use, parks and open space, greenways and trails, water quality, aquatic and terrestrial habitat, and land conservation that cover each watershed and the City of Durham. This was followed by the identification of specific site characteristics quantifiable using GIS that could be used to select and rank potential CAPP sites.

2.1 Documents and Data Sets Used to Develop Site Selection Criteria

2.1.1 Watershed Studies and Planning Documents

Previous watershed studies and planning documents were reviewed to identify problems and opportunities that the City and others have identified in each watershed. These documents helped shape the development of the site selection criteria and GIS analysis process as discussed in this plan. The documents were reviewed and important points taken from these documents are summarized below.

- **Durham's Comprehensive Plan** includes a Conservation and Environment element (amended August 17, 2015) which states *"The conservation of natural resources and protection of valuable open spaces are important in maintaining and improving the high quality of life that Durham residents desire. The community's natural resources and open spaces can be viewed as its "green infrastructure." The purpose of the Conservation and Environment Element of the Durham Comprehensive Plan is to promote the responsible use, protection and restoration of Durham County's green infrastructure."* The Conservation and Environment Element contains two goals: (1) provide a high quality natural environment which protects and preserves floodplains, natural inventory sites, and open space; and (2) provide ample open and green spaces for Durham residents and wildlife and protect important open spaces in Durham County from the impacts of development.
- **Durham Trails and Greenways Master Plan** (updated in 2011) is a guide to the development of a comprehensive trail system in Durham. The Plan contains policies that guide how trails should be developed. It depicts a series of greenways and trails in and around major stream corridors in the City of Durham and Durham County. It also shows the individual trails and how they interconnect with each other and serve various important destinations, like schools and parks.
- **Eastern Durham Open Space Plan** (dated 2007) provides a plan to conserve and protect open space in the Lick Creek, Little Lick Creek, and Panther Creek watersheds as these areas experience a significant increase in urban development.
- **Local Watershed Plans** developed by the North Carolina Division of Mitigation Services (NCDMS), previously the Ecosystem Enhancement Program, for several of the City's major watersheds. These Local Watershed Plans, with the help of local stakeholders, describe watershed degradation issues and appropriate solutions that include restoration opportunities, including preserving undeveloped tracts on headwater tributaries, targeting priority subwatersheds, and identifying properties along proposed greenway trails to facilitate acquisition.
- **Upper Neuse Clean Water Initiative Conservation Plan** (dated 2006) summarizes water quality protection issues and land use trends in the 770 square mile Falls Lake watershed. The plan recommends a large and coordinated effort to protect forested lands, including those along small headwater tributaries that are often not protected.

- **Upper Neuse Clean Water Initiative 2015-2045 Conservation Strategy** (dated 2015) is a guide for protecting drinking water supply resources through land protection using the best available science and geographic data to refine and refocus land protection priorities.
- **Neuse River Basinwide Water Quality Plan** (last update 2009) provides a summary of the current status of the City's watersheds that flow to the Neuse River and Falls Lake and provides recommendations for addressing water quality problems. The plan states that protection of headwater streams and undeveloped riparian areas is critically needed.
- **Cape Fear Basinwide Water Quality Plan** (updated in 2005) prepared by the North Carolina Department of Environmental Quality summarizes water supply needs, water quality protection issues, and land use trends in several of the City's watersheds that flow to the Cape Fear River. The goals of the plan include regaining the full use of impaired waters and identifying and protecting high value resource waters, including their riparian buffers.
- **Cape Fear River Basin Restoration Priorities** (last update 2009) represents a synthesis of efforts undertaken by NCDMS, with the help of local stakeholders, to accurately describe watershed degradation issues and appropriate solutions that include restoration opportunities. The plan identifies the following key goals: improve aquatic health, reduce flooding, create recreation opportunities, and educate the local community. To help achieve these goals, the watershed plan advocates the identification of critical areas for protection, including headwater tracts and identifying high quality riparian areas for preservation.
- **Water Quality Recovery Program for the Northeast Creek Watershed** (2009), developed by the City in response to the Total Daily Maximum Load (TMDL) for fecal coliform bacteria, provides a planning framework for improving water quality, including the preservation or mitigation of riparian buffers.
- **Design Specifications and Nutrient Accounting for Land Conservation** (submitted to NCDEQ-DWR in 2016), developed by UNRBA to define the practice of land conservation, provides design criteria and implementation specifications, and outlines nutrient credit assignments used for compliance with the Falls Lake Nutrient Management Strategy.
- **New Hope Corridor Open Space Master Plan** (1991), developed by the New Hope Corridor Advisory Committee and Coulter Associates to identify critical environmental areas that would link the Eno River State Park with the New Hope Creek and properties owned by the United States Corps of Engineers next to Jordan Lake. The committee published an update to the Master Plan in May 2000.
- **A Landscape Plan for Wildlife Habitat Connectivity in the Eno River and New Hope Creek Watersheds, North Carolina** (2019), developed by various organization and conservation groups in Orange and Durham County, including the Partners for Green Growth Program of the North Carolina Wildlife Resources Commission, North Carolina Botanical Garden, University of North Carolina Chapel Hill, Duke University, and the Eno-New Hope Landscape Conservation Group. This report conducted a geospatial analysis to identify high-quality habitat patches and potential wildlife corridors within the Eno River, New Hope Creek, and Little Creek watersheds. The GIS data produced by this report was used as a priority site criterion for the New Hope and Little Creek watersheds (see Section 2.2.1).

2.1.2 GIS-Compatible Data Sets

The watershed specific information and data provided in the documents listed above were supplemented by several GIS-compatible data sets to help identify the site characteristics that could be used to select and rank potential CAPP sites. The City of Durham and Durham County maintain extensive

GIS-compatible data sets developed from various data sources and agencies that were used to develop the site selection criteria, including:

- Streams
- Wetlands
- Parcels
- Land cover – to assess riparian vegetation cover and unmanaged forest land
- Existing land use – to determine vacancy status and identify publicly owned land
- Future land use – to assess risk of development
- Steep slopes
- Greenways
- Schools
- Parks
- Durham City and County limits
- Floodplain boundaries
- Falls Lake and Jordan Lake watershed protection overlays
- Existing stormwater control measures (SCMs)
- North Carolina Natural Heritage Program (NCNHP) – Element Occurrences
- NCNHP – Significant Natural Heritage Areas

During development of the WIPs for Ellerbe Creek, Third Fork Creek, Crooked Creek, Northeast Creek, Little Lick Creek, Eno River, New Hope Creek, and Little Creek, field crews collected an extensive data set on the health of streams and riparian buffers and the location of potential SCM retrofits. The following data collected by the field crews was also used to develop the site selection criteria:

- Stream quality rating (e.g., Excellent, Good, Fair, or Poor)
- Width and quality of riparian buffer on each side of the stream
- Severity of stream bank erosion occurring along each length of stream (e.g., High, Moderate, and Low)
- Location of potential retrofits to existing SCMs
- Location of potential new SCMs

The data listed above was also supplemented with information provided by established community groups that are focused on water quality, environmental quality, and watershed health, including:

- Ellerbe Creek Watershed Association (ECWA)
- Friends of South Ellerbe Creek
- Northeast Creek Streamwatch
- Upper Cape Fear River Basin Association
- Haw River Assembly
- Triangle Land Conservancy
- Eno River Association
- Eno-New Hope Landscape Conservation Group and other contributors to the 2019 Landscape Plan for Wildlife Habitat Connectivity

2.2 Site Selection Criteria and GIS Analyses

Using the information and data mentioned above, a total of 21 site characteristics were identified that could be assessed to select an individual property's critical protection value. In order to be selected, each site characteristic needed to be capable of being quantified using ArcGIS. Sixteen of the criteria,

defined as the Baseline Site Criteria, were applied to identify qualifying parcels. Five additional criteria, defined as the Priority Site Criteria, were applied to identify the highest priority parcels for protection and preservation of riparian buffers.

The Baseline Site Criteria and the minimum threshold values to receive a score are summarized in Table 1. The Priority Site Criteria and the minimum threshold values to receive a score are summarized in Table 2. More detailed explanations of the characteristics, the justification for their use, and the minimum thresholds required for each criterion are discussed in Section 2.2.1.

Additional criteria may be considered in the future. For example, a criterion that represents “development pressure” could be added to help prioritize sites that are at greater risk for development.

Table 1. Baseline Site Criteria

No.	Baseline Site Criteria	Threshold for Score	Score
1	Riparian area	Must contain an intermittent or perennial stream and its riparian buffer to qualify	Criteria must be met
2	Length of stream	Parcel contains a minimum of 500 feet of intermittent or perennial stream channel	≥ 1,000 ft = 4 ≥ 500 ft = 2
3	Not protected by Unified Development Ordinance (UDO)	All or a portion of the riparian buffer is not currently protected by standards in the UDO	1
4	Proximity to a proposed Stormwater Control Measure (SCM)	Within ¼ mile of an existing SCM or a proposed new SCM	1
5	“High-quality” stream and riparian buffer	Stream and riparian buffer identified as “high-quality” during stream assessments and recommended for preservation	1
6	Headwater stream	First-order stream	1
7	Wetlands	Any size wetland present within riparian buffer	1
8	Floodplain	Contains FEMA-regulated 100-year floodplain	1
9	Steep slopes	Riparian area contains slopes ≥ 15 percent	1
10	Rare or Endangered Species and Habitat	Parcel contains a North Carolina Natural Heritage Program element occurrence	1
11	Significant Natural Heritage Area (SNHA)	Within ¼ mile of SNHA	1
12	School	Within ¼ mile of a school	1
13	Parks	Within ¼ mile of a park	1
14	Existing Greenway	Within 200 feet of an existing greenway	1
15	Riparian Buffer Vegetation	Riparian buffer is more than 50% forested or unmanaged scrub/shrub cover	2
16	Vacancy Status	Listed as “vacant” in land use description field	2
Total Possible Baseline Points			20

Table 2. Priority Site Criteria

No.	Priority Site Criteria	Threshold for Score	Score
17	Located in a Priority Subwatershed (<i>applied only in Ellerbe Creek and Third Fork Creek Watersheds</i>)	All or a portion of the parcel must fall within a designated priority sub-basin	1
18	Parcel Area	Parcel size exceeds 5 acres	≥ 10 ac = 2 5-10 ac = 1
19	Adjacent to Protected Open Space (<i>applied in all watersheds except Ellerbe and Little Lick Creek Watersheds</i>)	Adjacent to existing protected public land	2
20	Forested or Unmanaged Land Cover (<i>applied in all watersheds except Ellerbe and Little Lick Creek Watersheds</i>)	Entire parcel is more than 50% forested or unmanaged shrub/scrub cover	1
21	Habitat or Corridor Patch (<i>applied only in New Hope Creek and Little Creek Watersheds</i>)	All or a portion of the parcel must fall within a Habitat or Corridor Patch as identified by the 2019 Eno-New Hope Landscape Plan for Wildlife Habitat Connectivity	Patch ranked as Moderate or above = 2 Unranked Patch = 1
Total Possible Priority Points			3 – 7 (Depending on watershed)

2.2.1 Detailed Description of Baseline and Priority Site Criteria

1. **Riparian Area.** To be considered, the parcel must contain a stream, be located within the city limits of Durham, and be privately owned to qualify for consideration as a protection opportunity. No score is given for this indicator.
2. **Length of Stream.** In assessing water quality and watershed benefits, given two parcels with similar size and land cover, the parcel with longer stream length will likely provide greater benefits relating to streambank protection, channel stability, aquatic habitat, and other watershed functions. Parcels with over 1,000 linear feet or more of intermittent or perennial stream frontage received a score of 4; sites with between 500 and 1,000 feet of stream frontage received a score of 2 for this criterion.
3. **Not Protected by Unified Development Ordinance (UDO).** Riparian buffer protection standards for development within the city limits are specified in Section 8.5 - Riparian Buffer Protection Standards of the UDO. Protection of riparian buffers is required adjacent to intermittent streams, perennial streams, modified natural streams, lakes, and ponds, including beaver ponds. Riparian buffers must be preserved and protected within 50 feet on each side of perennial and intermittent streams. Additional buffer width is required in watershed protection overlay zones. For example, riparian buffers must be preserved for a total width of 100 feet on each side of a perennial stream in the Falls Lake and Jordan Lake Protected Areas.

However, the UDO protections for riparian buffers do not provide protections beyond 50 feet outside of water supply watershed protection overlays, and also do not preclude development inside the 50-foot riparian buffer. For example, construction of a single-family residential home on an existing lot is allowed within the protected buffer if several conditions are met (Section 8.5.7.D of the UDO). The UDO also does not provide any level of protection along ephemeral streams. Therefore, the City should still consider acquiring properties with riparian buffers that are partially or fully protected by the UDO standards. Parcels received a score of 1 if the UDO standards did not fully protect the riparian buffers.

4. **Proximity to a Proposed Stormwater Control Measure (SCM).** Prioritizing riparian parcels in close proximity to areas that contain a proposed SCM would allow the City to concentrate its efforts and increase the likelihood of achieving perceivable results. Parcels within one-quarter mile of a proposed SCM were given a score of 1.
5. **High-Quality Stream and Riparian Buffer.** Any parcel that intersects a high-quality stream reach that is identified for preservation based on results from field surveys is assigned a score of 1 for this criterion.
6. **Headwater Stream.** Headwater streams comprise a large portion of total stream length in a watershed and protecting them improves the chances for maintaining water quality throughout a watershed. All first-order streams were considered headwater streams for the purpose of this analysis and received a score of 1.
7. **Wetlands.** Wetlands are important for the habitat they provide and their water quality and flood storage benefits. Determining the function and value of a wetland using GIS is highly problematic; therefore, properties that contained a wetland based on U.S. Fish and Wildlife Service's National Wetland Inventory (NWI) mapping, regardless of size or quality, received a score of 1 for this criterion.
8. **Floodplain.** Active floodplains help reduce downstream flooding by slowing stream flow and temporarily storing floodwaters. Local ordinances regulate the types of disturbance and development allowed in the 100-year floodplain to an extent, and site-specific plans can assure that structures are not placed in the floodway. However, any disturbance (e.g., soil compaction) can harm the land's natural properties, and protecting the floodplain from any disturbance would best preserve its watershed functions. Therefore, any site that contained a floodplain was given a score of 1 for that criterion.
9. **Steep Slopes.** Steep slopes should be protected to reduce sedimentation and erosion problems that can affect in-stream, wetland, and riparian habitat and overall stream health and stability. Steep slopes are generally defined as those over 15 percent. Using GIS topographic data, a surface was created that accurately quantified the slopes within the watershed. Parcels that contain riparian buffers with slopes equal to or greater than 15 percent received a score of 1.
10. **Rare and Endangered Species and Habitat.** The North Carolina Natural Heritage Program (NCNHP) tracks all existing and historical records of rare and endangered species, referred to as "element occurrences." Built into the geospatial data that defines each element occurrence is an uncertainty distance that accounts for the potential location of the species and its habitat. Any parcel that overlapped an element occurrence was therefore considered close to a rare or endangered species and its habitat and received a score of 1 for this criterion.
11. **Significant Natural Heritage Areas.** The NCNHP also tracks significant natural heritage areas (SNHA) that are either ecologically important or that contains rare species. Any property within one-quarter mile of one of these sites received a score of 1 for this criterion.
12. **Schools.** Sites close to schools provide educational opportunities for students to learn about the natural environment generally, and water quality and watershed health, specifically. A site within one-quarter mile of a school received a score of 1 for this criterion.
13. **Parks.** Preserving additional land near existing parks maintains connectivity of natural areas. As opposed to preserving isolated sites where surrounding land is not protected, expanding already protected areas ensures that the overall investment in protection will be cost effective. Sites close to existing parks provide the opportunity to further extend and expand protected natural

areas within the watershed. Sites within one-quarter mile of an existing park were given a score of 1 for this criterion.

14. **Existing Greenway.** Like parks, expanding protected areas near greenways provide multiple benefits and can be a cost-effective protection strategy. Targeting preservation near greenways provides opportunities to expand the greenway, educational opportunities such as interpretative signs that can inform people about the watershed and their role in protecting it, and additional recreational opportunities. A site within 200 feet of an existing greenway or trail received a score of 1 for this criterion. The City of Durham is in the process of reevaluating proposed trails projects. Future analyses should include data based on the results of this reevaluation.
15. **Riparian Buffer Vegetation.** Vegetated areas along streams provide habitat, filter nutrients from stormwater, and reduce concentrated stormwater flow into streams, which can lead to erosion and stream instability. For the purposes of this CAPP, the riparian area was defined as a 100-foot buffer around all streams. Sites with riparian areas that are at least 50 percent vegetated in forest or unmanaged scrub/shrub conditions were given a score of 2 for this criterion.
16. **Vacancy Status.** Given the CAPP focus on preservation, vacant parcels offer the best opportunity for acquisition and are another method for identifying those parcels that may have intact natural features that are worth preserving. Any vacant parcel received a score of 2 for this criterion.
17. **Located in a Priority Subwatershed.** *(applied only in the Ellerbe Creek and Third Fork Creek Watersheds).* Certain subwatersheds were designated as priorities based on data from existing studies or during development of the Watershed Improvement Plan. Preservation in these subwatersheds will help protect areas with better water quality and help control and direct growth in some of the least developed portions of the watershed. Sites within a priority subwatershed were given a score of 1 for this criterion.
18. **Parcel Area.** Priority was assigned to larger parcels, with sites larger than 10 acres receiving a score of 2, while those between 5 and 10 acres receiving a score of 1.
19. **Adjacent to Protected Open Space.** *(applied in all watersheds except Ellerbe and Little Lick Creek Watersheds).* Existing parks, open space, and natural spaces are owned by federal agencies, state, and local governments, and by watershed groups. Parcels directly adjacent to a protected open space received a score of 2.
20. **Forested or Unmanaged Land Cover.** *(applied in all watersheds except Ellerbe and Little Lick Creek Watersheds).* Priority was assigned to parcels that have intact forested or unmanaged land cover that would not need extensive replanting. Parcels with at least 50 percent wooded or unmanaged land cover received a score of 1.
21. **Habitat or Corridor Patch.** *(applied only in the New Hope Creek and Little Creek Watersheds).* The 2019 *Landscape Plan for Wildlife Habitat Connectivity* provided a GIS dataset that ranked the area within the New Hope Creek and Little Creek watersheds based on their value as wildlife habitat and as a corridor connecting natural communities. Patches that were identified by this study were scored as Unranked, Moderate, High, Higher, or Highest. Parcels that overlapped a patch ranked Moderate or above were given a score of 2 and parcels that overlapped an unranked patch were given a score of 1. Unranked patches were included because they represent areas that would otherwise score as Moderate or above, but lack a certain

characteristic (e.g., a patch whose connectivity may be blocked by a road). Thus, unranked parcels are analogous to the concept of urban gems in this CAPP (see Section 2.2.2).

2.2.2 GIS Site Selection Analysis and Site Assessment

The GIS analyses for each watershed, completed using ESRI's ArcGIS software, were designed to identify privately-held parcels with riparian buffers suitable for preservation. This site assessment was performed in four steps. This began by identifying all parcels within the tax parcel layer that contain streams and riparian areas, and then analyzing the other site attributes discussed in Section 2.2.1. The results of the GIS analysis were used to rank all privately-held riparian parcels.

First, the tax parcel data was screened to select privately owned land that met Criterion #1 – the parcel must contain a stream and the riparian buffer on at least one side of the stream. This step eliminated privately-owned upland areas that do not contain a stream or riparian buffer, and also eliminated all publicly-owned parcels since riparian buffers on public land typically have some level of protection. The privately-owned parcels that met Criterion #1 are referred to as “qualifying” parcels. Due to the large amount of residential development within the New Hope Creek and Little Creek watersheds, properties with a land use designation of Homeowners Association or Apartment-Garden were excluded from review as keystone properties or “urban gems” due to the protection granted to open spaces during the City's site plan approval process.

Next, the baseline criteria (criteria #1 through #16 presented in Table 1) were applied to the qualifying parcels, with a maximum possible score of 20. The total baseline score from this step reflects a parcel's potential to provide some combination of water quality, ecological, and recreational benefits; however, this baseline score was determined to only partially address each parcel's value for critical land protection. Therefore, two additional steps were performed to identify the high-priority parcels.

Then, the relevant priority criteria (criteria #17 through #21 presented in Table 2) were applied to the qualifying parcels to pinpoint the highest-priority parcels that could serve as “keystone” properties around which larger protected areas might be built. The combined score from the baseline criteria and the priority criteria were used to identify the keystone properties, with a maximum score ranging from 23 to 27 (depending on watershed). Based on the characteristics found in each watershed, the minimum score to identify a keystone property varied from watershed to watershed, as well as the total number of keystone parcels in each watershed. Results of this analysis are summarized in Table 3 for each watershed.

***KEYSTONE** properties are the highest-priority parcels identified for protection in each watershed that can expand high-quality riparian areas that are already protected, such as existing parks, or that could serve as parcels around which larger protected areas might be built.*

***URBAN GEMS** are properties that contain high-quality riparian areas in heavily urbanized portions of each watershed which are isolated or lack connectivity to other protected open spaces. Although Urban Gems would not qualify as a keystone property, they still hold specific individual characteristics that are deemed particularly worthy of protection.*

Table 3. Results of Baseline & Priority Site Criteria (Keystone Parcels)

Watershed	Date of Analysis	Minimum Score for Keystone Parcel	Total Number
Ellerbe Creek	2008	7	53
Third Fork Creek	2010	7	123
Northeast Creek	2012	11	90
Crooked Creek	2012	11	12
Little Lick Creek	2015	9	49
Eno River	2017	13	45
New Hope Creek	2021	11	93
Little Creek	2021	7	10
Total Number of Keystone Parcels			475

Some of the keystone properties have been verified by field crews during the stream inventory and assessments carried out during development of each WIP to assure that the data accurately reflected the current conditions on the parcel.

Finally, the parcels were evaluated to identify potential “urban gem” parcels. Urban gems are undeveloped parcels in more heavily urbanized portions of the watershed that may not have been identified using the Baseline and Priority Criteria analysis. Typically, these parcels are not captured as a result of small size, location in the watershed, or lack of connectivity to other protected open spaces. Despite their lower score in this analysis, these properties may still be worthy of protection as they provide value for watershed health and water quality. For instance, these parcels may serve to preserve and protect headwater streams, or they may provide an ‘open-space refuge’ within an area of extensive urban development. To identify these parcels, results from the Baseline and Priority analysis are further examined by the City and input is solicited from key stakeholders, such as local watershed groups. Results of this analysis are summarized in Table 4 for each watershed.

Table 4. Urban Gem Parcels by Watershed

Watershed	Date of Analysis	Total Number of Urban Gems
Ellerbe Creek	2008	53
Third Fork Creek	2010	78
Northeast Creek	2012	12
Crooked Creek	2012	5
Little Lick Creek	2015	13
Eno River	2017	3
New Hope Creek	2021	14
Little Creek	2021	0
Total Number of Urban Gems		178

The appendices to this report, organized by watershed, contain the following information:

- Summary of the results for Site Selection Analysis for each watershed;
- Watershed-scale map presenting the keystone properties and urban gems for each watershed. Any property that was scored using the selection criteria but not identified as either a keystone property or urban gem is labelled as an “Additional Riparian Property”; and
- Tabular summary of the keystone properties and urban gems presenting the scores assigned to the baseline criteria (#1 - #16) and the relevant priority criteria (#17 - #21) for each watershed.

3.0 Further Steps

The results presented above are based on observations noted by field crews while conducting field work for each watershed plan, analysis of the GIS-based data, and a review of the data and recommendations found in existing studies, plans, and other relevant information. In order to implement the Critical Areas Protection Plan, the City will need to complete the following tasks:

1. Perform GIS analyses and field surveys to update parcels and maps in order to verify existing conditions, availability, and development changes that have occurred since initial analyses were conducted.
2. Review policies or regulations such as riparian buffer protection standards or stormwater ordinances that may have changed since the initial analyses were completed. This would include items such as potential nutrient credits for land protection and additional site selection criteria that have been added, such as development pressure.
3. Initiate discussions with the property owners to assess their willingness to sell or protect identified parcels to help improve watershed health.
4. Convene a workshop with key stakeholders and established watershed groups (e.g., Ellerbe Creek Watershed Association, Eno River Association) and other land trust organizations to coordinate acquisition and long-term management of high-priority, high-quality parcels across the city.
5. Prioritize acquisition based on opportunities to aggregate and connect parcels or where multiple benefits may be realized.

It is important to note that several of the properties initially recommended for protection have already been developed, acquired for future development, or acquired for protection. Once the five steps above have been completed to update the CAPP for current conditions, a phased approach is recommended in which the highest quality properties are selected for acquisition in the near-term. Once these properties are protected, longer-term priorities should be targeted that provide connectivity to already acquired properties.

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Appendix A

Critical Area Protection Plan for the Ellerbe Creek Watershed

Completed in 2008

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1.0 Results

Based on the initial assessment completed in 2008 of qualifying parcels within the city limits, and the scores assigned for the baseline and priority criteria, 53 keystone properties and 53 urban gems were identified in the Ellerbe Creek watershed. The watershed-scale map provided in this appendix presents all the qualifying parcels, the keystone properties, the urban gems, and schools, parks, and other protected or public lands. Tables A-1 and A-2 provide the individual scores for each keystone property and urban gem for the baseline and priority criteria. A detailed summary of critical area protection and preservation opportunities are discussed below by sub-region within the watershed.

NOTE: The current availability of identified parcels should be evaluated when using this report.

1.1 Western Ellerbe Creek

Western Ellerbe Creek includes a portion of Duke Forest, Bennett Place (a state historical site), and two golf courses (Croasdaile and Hillandale). Six thousand feet of Ellerbe Creek was restored through projects funded by the North Carolina Division of Mitigation Services (previously the Ecosystem Enhancement Program), and the Ellerbe Creek Watershed Association (ECWA) has also completed a stream restoration project.

This area of the watershed includes 12 keystone properties. Ten proposed SCM retrofit sites are proposed in this area of the watershed; eight of these coincide with keystone properties. The largest keystone property is a section of Duke Forest in the headwaters of Ellerbe Creek. Generally, Duke Forest lands are considered moderately protected and operations follow an established forestry management plan, therefore acquisition by the City is not recommended. Several proposed SCM retrofits that coincide with keystone properties are located on the tributary that passes through Croasdaile Country Club.

The headwaters of this tributary are still forested and parcels in this area were identified as keystone properties. The City might consider pursuing these sites, although the opportunities for connecting them to other public lands are limited, which also limits opportunities for educational and recreational activities. Another keystone property sits on a tributary just north of the Hillandale golf course. Purchasing or acquiring easements on this property, and several smaller ones to the south, could benefit Ellerbe Creek and build on the restoration activities occurring in this area. Property owned by ECWA and the City are just downstream of this area. Preservation opportunities on the south side of Ellerbe Creek are very limited.

Due to the size and the relative un-developed nature of the parcels in this area, no urban gems were selected in this section of the watershed.

1.2 South Ellerbe Creek Subwatershed

South Ellerbe Creek is one of the most developed sections of the watershed and includes most of downtown Durham. This area of the watershed contains three keystone properties, all of which are

KEYSTONE properties are the highest-priority parcels identified for protection in each watershed that can expand high-quality riparian areas that are already protected, such as existing parks, or that could serve as parcels around which larger protected areas might be built.

URBAN GEMS are properties that contain high-quality riparian areas in heavily urbanized portions of each watershed which are isolated or lack connectivity to other protected open spaces. Although Urban Gems would not qualify as a keystone property, they still hold specific individual characteristics that are deemed particularly worthy of protection.

located along the existing South Ellerbe Creek Trail. The City should pursue any additional options for preservation along this greenway.

In addition to the keystone property sites, the South Ellerbe Creek portion of the watershed contains 25 urban gems within the city limits. Nine of these parcels are adjacent to the South Ellerbe Creek Trail and would further enhance this urban greenway. Four are along a tributary of South Ellerbe Creek between the proposed Railroad Trail and existing South Ellerbe Trail and in combination with easements on several residential properties have the potential to create a network of greenways in this area. Twelve are scattered along a tributary that begins across the street from the E.K. Powe Elementary School and enters Westover Park at the intersection of Onslow Street and Club Boulevard. The Friends of South Ellerbe Creek have been actively advocating for the preservation of one keystone property, the vacant lot across from the E.K. Powe Elementary School, that contains a headwater stream and seep wetland. This keystone property would provide an excellent educational opportunity for children attending the school. It also coincides with one of the eight proposed SCM retrofit sites identified in the South Ellerbe Creek portion of the watershed. If the City decides to acquire some of the smaller urban gem properties along this tributary, the City should also consider to do so in conjunction with attempting to also acquire conservation easements on some of the adjacent developed properties.

1.3 Central Ellerbe Creek

This portion of the watershed includes the Duke Homestead (a state historic site), Durham Regional Hospital, the Edison Johnson Community Center and the Museum of Life and Science. The City should consider preserving the forested portions of these sites. The section of Ellerbe Creek that runs through Northgate Park has been restored through funding provided by the North Carolina Division of Mitigation Services. This area of the watershed includes 12 keystone properties and nine urban gems. Sixteen proposed SCM retrofit sites are located in this portion of the watershed; nine are located on keystone properties or urban gems.

There are several keystone properties along Ellerbe Creek from the point where it crosses under I-85 near Guess Road until it joins up with several large tracts already owned by the City on East Club Blvd. The developed parcels along Broad Street contain intact forested buffers, and when Ellerbe Creek turns southeast it passes through a number of City-owned properties, including the Edison Johnson Community Center, the Museum of Life and Science, and Northgate Park. Large portions of the Edison Johnson Community Center and the Museum of Life and Science are still forested. After passing through the park, Ellerbe crosses under Club Blvd and runs through a number of vacant forested parcels owned by the City. Aerial photography and satellite imagery show that land cover in the next portion of the creek is largely forested and the City should consider prioritizing acquisition in this area.

The Greater Triangle Community Foundation owns a keystone property on a tributary east of Roxboro Road. Aerial photography indicates that a portion of this property is forested; it also is the potential site for two proposed SCM retrofits. This site is isolated from other keystone properties, but the riparian buffers along this tributary appear relatively intact and the City should investigate opportunities for preserving this area.

Three urban gem properties are located just south of Murray Avenue along several tributaries that join Ellerbe Creek. Adjacent properties are residential, but large portions of the riparian buffer remain intact. At some future point, the City may consider acquiring easements along these properties.

Six urban gems combine with several smaller keystone properties along a short tributary that is north of East Ellerbe Street and east of Cascadilla Street. The City should investigate opportunities for preserving these undeveloped parcels.

1.4 Goose Creek Subwatershed

Goose Creek is another highly-developed portion of the Ellerbe Creek watershed. This section includes Interstate 85, Highway 70 (both bypass and business), Highway 98, and North Miami Boulevard. This area of the watershed includes 19 keystone properties within the city limits and an additional 16 urban gems. Ten potential new SCM sites are located in the Goose Creek watershed; seven of which coincide with keystone properties or urban gems.

Three areas are particularly worthy of immediate investigation for preservation. The first is along the proposed Railroad Trail, just south of I-85. A combination of keystone properties and low priority qualifying parcels border this corridor and have the potential to protect over 3,000 feet of stream. To the north, this area can connect with property owned by the City and continue into the eastern portion of the watershed.

The second area is just east of North Hoover Road and south of Cheek Road. Several keystone properties in this area are currently forested and protection of them would protect the headwaters of this tributary. Protecting this area also has the potential to create a corridor that could connect with the Railroad Trail to the west.

The third area is built around a 175-acre property that contains four first-order streams and has been identified as a proposed SCM retrofit site. Preserving this tract and the riparian buffer along the stream would allow the City to build a protected stream corridor all the way to the confluence with Ellerbe Creek.

Both the second and third protection areas proposed here are located in a portion of the Ellerbe Creek watershed with high development potential at the time of the analysis.

Four urban gems are on headwater streams north of Ashe Street and, in combination with a number of other riparian parcels, build upon an existing park on Harvard Avenue. Seven other urban gems are along a tributary that runs between Liberty and Holloway, east of Miami Boulevard. Five urban gems are north of Juniper and bisected by Miami Boulevard. These parcels connect to an existing city park and the proposed Goose Creek Trail.

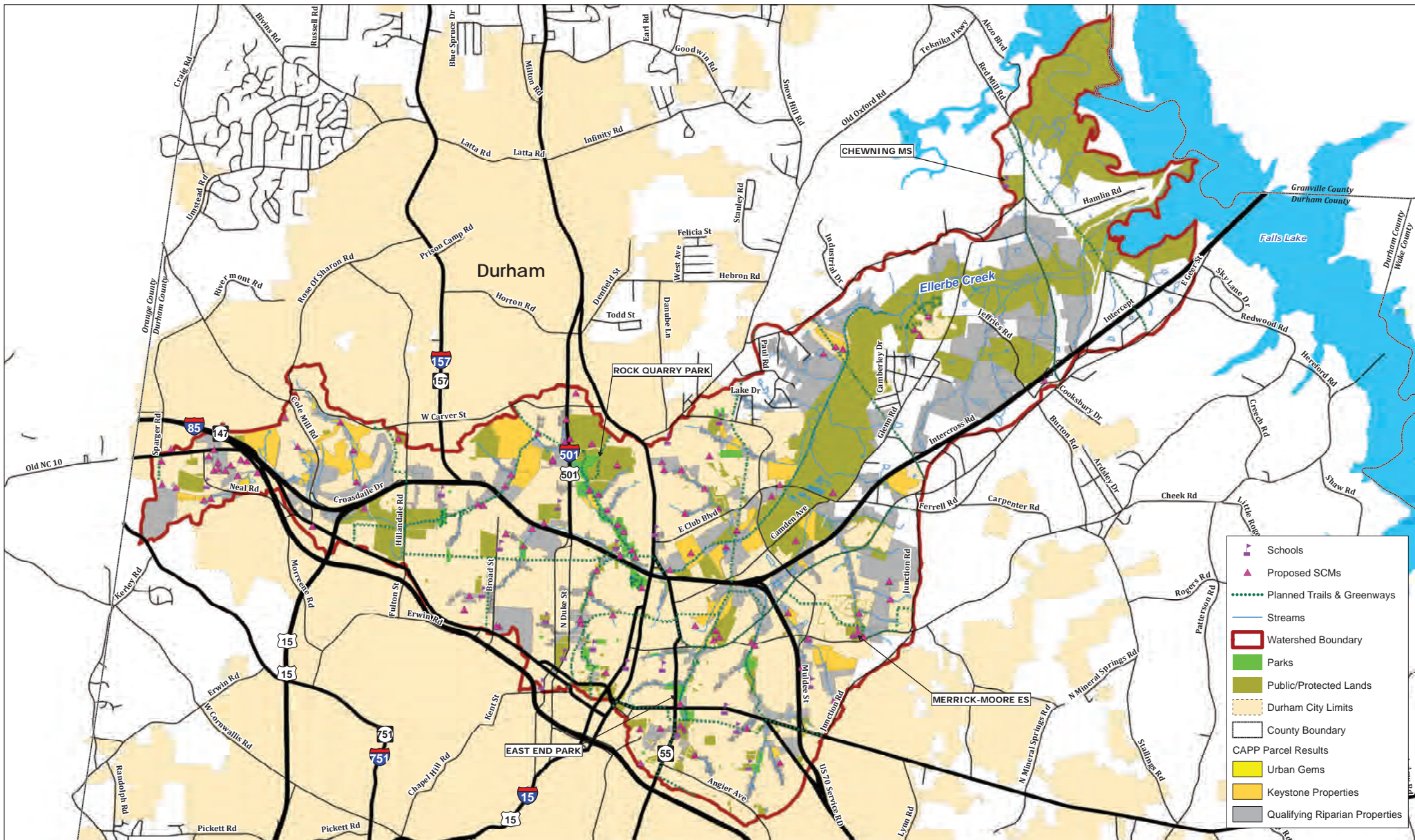
1.5 Eastern Ellerbe Creek

This portion of the watershed is the least developed and contains large tracts owned by the United States Army Corps of Engineers (USACE). A small percent of the land use in this region is in agriculture and the City may wish to consider whether it wishes to consider preservation of farmland into the criteria considered to identify keystone properties. This area of the watershed includes seven keystone properties. Given the relatively undeveloped nature of this area and the typical parcel sizes, no urban gems were identified in this portion of the watershed.

The keystone properties lie on a tributary to the west of Ellerbe Creek, intersecting both the proposed Railroad Trail and Dearborn Drive. Acquiring these properties would both protect the tributary and allow for a longer protected corridor along the length of the Railroad Trail.

Ellerbe Creek Watershed
Critical Area Protection Plan Map

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TABLES

Ellerbe Creek Watershed

Table A-1. Keystone Property Parcel Scores

Table A-2. Urban Gem Parcel Scores

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Table A-1. Keystone Property Parcel Scores for Ellerbe Creek Watershed (2008)

Keystone Property Parcel Scores for ELLERBE CREEK WATERSHED																			
PID	Length of stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage	Vacancy Status	Parcel Area	Located in Priority Sub-basin	TOTAL SCORE
126250	2,258	4	0	1	1	1	0	1	1	0	0	0	0	1	1	2	2	1	16
160417	1,782	4	0	1	1	1	1	1	1	0	0	0	0	1	1	2	1	1	16
130074	1,522	4	0	1	1	1	1	1	0	0	0	0	0	1	1	2	1	0	14
207450	1,158	4	0	0	0	1	1	0	0	1	1	0	1	0	1	2	0	1	13
120381	2,071	4	0	1	0	1	1	1	1	0	0	0	0	1	1	2	0	0	13
130742	3,087	4	0	1	1	1	1	0	0	0	0	1	0	0	1	0	1	1	12
160453	2,217	4	0	0	0	0	1	1	1	0	0	0	0	1	1	2	1	0	12
109635	1,032	4	0	0	1	1	1	1	0	0	0	0	0	1	1	2	0	0	12
175212	900	2	0	1	0	1	1	0	0	0	0	0	0	0	1	2	2	1	11
120338	1,504	4	0	1	0	1	1	1	0	0	0	0	0	1	1	0	1	0	11
130566	1,305	4	0	1	1	0	1	0	0	0	0	0	0	0	0	0	2	1	10
106690	611	2	0	1	0	0	1	1	0	0	0	1	1	1	1	0	0	1	10
120335	578	2	0	1	0	1	1	1	0	0	0	0	0	1	1	2	0	0	10
161099	1,567	4	0	0	1	1	0	0	1	0	0	1	0	0	1	0	1	0	10
207895	1,373	4	0	0	0	1	0	0	0	0	0	0	0	0	1	2	1	1	10
174316	605	2	0	0	1	1	0	1	0	0	0	0	0	0	1	2	0	1	9
174294	1,003	4	0	0	1	1	1	0	0	0	0	0	0	0	1	0	0	1	9
126269	565	2	0	1	0	0	0	1	0	0	0	1	1	1	1	0	0	1	9
126267	547	2	0	1	1	0	0	1	0	0	0	0	0	1	1	0	1	1	9
130059	26	0	0	1	1	1	1	1	0	0	0	0	0	1	1	2	0	0	9
113354	407	0	0	1	0	0	1	1	1	0	0	0	1	1	1	2	0	0	9

Keystone Property Parcel Scores for ELLERBE CREEK WATERSHED																			
PID	Length of stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage	Vacancy Status	Parcel Area	Located in Priority Sub-basin	TOTAL SCORE
109665	840	2	0	0	1	1	1	1	1	0	0	0	0	1	1	0	0	0	9
113352	935	2	0	1	0	0	0	1	1	0	0	0	0	1	1	2	0	0	9
129393	843	2	0	0	0	1	0	0	0	0	0	1	1	1	1	2	0	0	9
197032	1,018	4	0	0	0	1	0	0	1	0	0	0	0	0	1	2	0	0	9
160777	646	2	0	1	1	1	0	0	0	0	0	1	0	0	1	2	0	0	9
160516	1,595	4	0	0	0	0	1	1	0	0	0	0	0	0	1	2	0	0	9
204968	269	0	0	0	1	0	1	1	1	0	0	0	0	1	1	2	0	1	9
207453	0	0	0	0	0	0	1	0	0	1	1	0	1	0	1	2	0	1	8
202807	0	0	0	0	0	0	1	0	0	1	1	0	1	0	1	2	0	1	8
175271	873	2	0	1	0	1	0	0	0	0	0	0	0	0	1	2	0	1	8
174294	1,003	4	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	1	8
130744	556	2	0	0	1	1	0	0	0	0	0	0	0	0	1	2	0	1	8
105803	81	0	0	1	0	0	0	1	0	0	0	1	1	1	1	2	0	0	8
105802	0	0	1	0	0	0	0	1	0	0	0	1	1	1	1	2	0	0	8
115254	925	2	0	0	0	0	0	1	0	0	0	0	1	1	1	2	0	0	8
120919	729	2	0	0	0	1	0	0	0	0	0	1	1	0	1	2	0	0	8
129684	617	2	0	0	0	1	0	0	0	0	0	1	1	0	1	2	0	0	8
159598	1,578	4	0	0	0	1	0	0	1	0	0	1	0	0	1	0	0	0	8
168457	1,032	4	0	0	0	1	0	0	0	0	0	0	0	0	1	2	0	0	8
160564	580	2	0	0	0	1	1	1	0	0	0	0	0	0	1	2	0	0	8
130299	1019	4	0	0	1	0	1	0	0	0	0	0	0	0	0	2	0	0	8
174305	167	0	0	0	1	1	0	1	0	0	0	0	0	0	1	2	0	1	7

Keystone Property Parcel Scores for ELLERBE CREEK WATERSHED																			
PID	Length of stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage	Vacancy Status	Parcel Area	Located in Priority Sub-basin	TOTAL SCORE
105801	0	0	0	0	0	0	0	1	0	0	0	1	1	1	1	2	0	0	7
113666	0	0	1	0	0	0	0	1	0	0	0	0	1	1	1	2	0	0	7
113667	0	0	1	0	0	0	0	1	0	0	0	0	1	1	1	2	0	0	7
128593	72	0	1	0	0	1	0	0	0	0	0	0	1	0	1	2	0	1	7
129161	327	0	0	0	1	0	1	1	0	0	0	0	0	1	1	2	0	0	7
120350	221	0	0	0	0	1	1	1	0	0	0	0	0	1	1	2	0	0	7
109609	447	0	0	1	0	1	0	1	0	0	0	0	0	1	1	2	0	0	7
113353	131	0	0	1	0	0	0	1	0	0	0	0	1	1	1	2	0	0	7
113355	27	0	0	0	0	0	0	1	1	0	0	0	1	1	1	2	0	0	7
129726	51	0	1	0	0	1	0	0	0	0	0	1	1	0	1	2	0	0	7

Table A-2. Urban Gem Parcel Scores for Ellerbe Creek Watershed (2008)

Urban Gem Parcel Scores for ELLERBE CREEK WATERSHED																		
PID	Length of stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage	Vacancy Status	Parcel Area	TOTAL SCORE
105803	81	0	0	1	0	0	0	1	0	0	0	1	1	1	2	2	2	11
105802	0	0	1	0	0	0	0	1	0	0	0	1	1	1	2	2	2	11
101833	830	3	0	1	1	1	0	0	0	0	0	1	0	0	0	2	2	11
105801	0	0	0	0	0	0	0	1	0	0	0	1	1	1	2	2	2	10
101711	52	0	1	1	0	1	0	0	0	0	0	1	1	0	0	2	2	9
105622	48	0	1	1	0	1	0	1	0	0	0	0	1	0	0	2	2	9
105782	0	0	1	0	0	0	0	1	0	0	0	1	1	1	0	2	2	9
100978	69	0	1	1	0	1	0	0	0	0	0	0	1	0	0	2	2	8
106622	0	0	0	0	0	0	0	1	0	0	0	1	1	1	0	2	2	8
101710	63	0	1	0	0	1	0	0	0	0	0	1	1	0	0	2	2	8
101709	63	0	1	0	0	1	0	0	0	0	0	1	1	0	0	2	2	8
100362	111	0	1	0	0	1	0	1	0	0	0	0	1	0	0	2	2	8
105650	8	0	1	1	0	1	0	0	0	0	0	0	1	0	0	2	2	8
105522	149	0	0	0	0	1	0	1	0	0	0	0	1	1	0	2	2	8
105660	95	0	0	1	0	1	0	0	1	0	0	0	1	0	0	2	2	8
106624	0	0	1	0	0	0	0	1	0	0	0	1	1	0	0	2	2	8
113469	38	0	1	0	0	1	0	1	0	0	0	0	1	0	0	2	2	8
113476	92	0	1	0	0	1	0	1	0	0	0	0	1	0	0	2	2	8
114390	110	0	0	0	0	1	1	0	0	0	0	1	1	0	0	2	2	8
114347	38	0	1	0	0	1	0	0	0	0	0	1	1	0	0	2	2	8
100979	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	2	2	7
100339	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	2	2	7
100364	44	0	1	0	0	0	0	1	0	0	0	0	1	0	0	2	2	7
106400	4	0	0	1	0	0	0	1	0	0	0	1	0	0	0	2	2	7
101698	88	0	1	0	0	0	0	0	0	0	0	1	1	0	0	2	2	7

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Urban Gem Parcel Scores for ELLERBE CREEK WATERSHED

[illegible]

Appendix B

Critical Area Protection Plan for the Third Fork Creek Watershed

Completed in 2010

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1.0 Results

Based on the initial assessment of qualifying parcels within the city limits, and the scores assigned for the baseline and priority criteria, 123 keystone properties and 78 urban gems were identified in the Third Fork Creek watershed. The watershed-scale map provided in this appendix presents all the qualifying parcels, the keystone properties, the urban gems, and schools, parks, and other protected or public lands. Tables B-1 and B-2 provide the individual scores for each keystone property and urban gem for the baseline and priority criteria.

NOTE: The current availability of identified parcels should be evaluated when using this report.

Most of the keystone properties are located along the main stem of Third Fork Creek in areas adjacent to publicly-owned land. Another area that contains several keystone properties is located in the upper Rocky Creek watershed near R.N. Harris Elementary School.

Most of the urban gems are in the upper portion of the watershed where most of the dense urban development has occurred. The smaller urban gems tend to be small patches of scrub-shrub or immature forest of very low quality that may not be valuable as protection sites. Some urban gems are likely to be undevelopable. The medium to large urban gems, especially those that are steeply sloping and protect both sides of a stream, appear to be the most desirable protection opportunities amongst these properties.

The combination of an SCM retrofit and riparian buffer protection would provide unique opportunities to treat stormwater while protecting existing natural areas that already provide natural infiltration and other watershed functions. Only two proposed SCM retrofit opportunities intersect with urban gem properties in the entire watershed, and these sites are located in the Third Fork Creek Headwaters subwatershed. No proposed SCM retrofit opportunities correspond with keystone properties.

A detailed summary of critical area protection and preservation opportunities are discussed below by subwatershed.

1.1 Rocky Creek - Subwatershed TFC6

The Rocky Creek subwatershed (identified as subwatershed TFC6 on the map) consists of older medium and high-density residential areas with commercial/industrial/office areas along major transportation corridors throughout the watershed. The eastern portion of this subwatershed is predominantly commercial and industrial development; however, there are large tracts of land that are not yet developed. A number of Durham County public schools, most of NC Central University (NCCU), and Durham Technical Community College are located within this subwatershed. Development pressure is expected to be low due to the developed nature of this subwatershed and limited development activity.

One keystone property that contains a large beaver pond that is owned by the North Carolina Agricultural Commission (NCAC) is slated to go into easement by donation to the County Agricultural Extension once six of the approximately 44 acres are sold to another party, most likely to be the portion

***KEYSTONE** properties are the highest-priority parcels identified for protection in each watershed that can expand high-quality riparian areas that are already protected, such as existing parks, or that could serve as parcels around which larger protected areas might be built.*

***URBAN GEMS** are properties that contain high-quality riparian areas in heavily urbanized portions of each watershed which are isolated or lack connectivity to other protected open spaces. Although Urban Gems would not qualify as a keystone property, they still hold specific individual characteristics that are deemed particularly worthy of protection.*

that is closest to Briggs Avenue (M. Wallace, NC Cooperative Extension – Durham County Center, personal communication to Peter Cada, February 26, 2010).

Within the Rocky Creek subwatershed, 29 keystone properties and 29 urban gems were identified. Proposed SCM retrofit opportunities do not coincide with these properties. Many of the keystone properties would provide multiple protection benefits. A large majority are adjacent to trails, including six along the American Tobacco Trail (ATT). Three keystone properties are adjacent to the NCAC planned easement property. Most of the keystone properties in this subwatershed have steep slopes, or contain wetlands and floodplains.

Approximately one-third of the urban gems are located within the Rocky Creek subwatershed. All but one of these properties contains steep slopes. Most of the urban gems are vacant properties with unmanaged forest within or near riparian areas.

1.2 Third Fork Creek Headwaters - Subwatershed TFC5

The Third Fork Creek Headwaters subwatershed (identified as subwatershed TFC5 on the map) has a similar land use distribution as the Rocky Creek subwatershed. The northern portion of this subwatershed is predominantly commercial and industrial development including a portion of Durham's Commercial Business District. The subwatershed contains many parks, including Forest Hills Park. It contains a small portion of NCCU but no other schools. This subwatershed is highly developed with limited opportunities for further development activity, therefore, the recommended keystone properties and urban gems are expected to have low development pressure.

Only seven keystone properties are located in this subwatershed, while 43 (over 60%) of the urban gem opportunities are located in this subwatershed. Two urban gems overlap with a proposed SCM retrofit site, which is the only instance in the Third Fork Creek watershed where a recommended keystone property or urban gem coincides with a proposed SCM retrofit site.

All of the keystone properties have steep slopes and appear to be vacant. The three largest keystone properties are fully covered by unmanaged forest. Most of the urban gems are on vacant properties, but those that are not present offer other benefits, such as located adjacent to a park, a greenway, or a school. Many of the urban gem properties were not assessed during the stream assessment and may contain buffer or stream restoration opportunities. Like the keystone properties, all urban gems in this subwatershed contain steep slopes.

1.3 Upper Third Fork Creek - Subwatershed TFC4

The Upper Third Fork Creek subwatershed (identified as subwatershed TFC4 on the map) contains a mix of medium and high density residential with commercial, industrial, and office areas only along major transportation corridors. Several new developments have emerged in this subwatershed over the past 5-10 years which consist mostly of medium to high density residential with associated suburban commercial centers. The subwatershed contains three parks but no schools.

Multiple instances of beaver activity are present in this subwatershed. An extensive beaver pond complex has been observed just downstream of Martin Luther King, Jr. Parkway. An abundance of wildlife has been observed in this area along the Third Fork Creek trail, where most of this land is already owned by the City of Durham. Two other areas of beaver activity exist about a half mile downstream of E. Cornwallis Road. One is a minor dam on the main stem of Third Fork Creek, and the other is a major beaver pond area on the east side of the main stem (this beaver pond area is located mostly on one large privately-owned parcel) which has been identified as a keystone property.

Most of the protection opportunities in this subwatershed are keystone properties (42), and only a few urban gems (5) were identified. None of these correspond with a proposed SCM retrofit opportunity. The keystone properties represent over one-third of the total identified in the entire watershed, almost all of which are vacant. All but one of the keystone properties have steep slopes. The larger parcels are along the main stem and provide connectivity with unmanaged forest on public land. The smaller parcels along several tributaries do not provide connectivity benefits but may provide important protection benefits for steep slopes and headwater riparian areas. All the urban gems are vacant and consist primarily of unmanaged forest, with two located in the southern portion of the watershed adjacent to forested, publicly-owned land.

The large keystone property just northeast of Martin Luther King, Jr. Parkway and southeast of the main stem of Third Fork Creek has been developed as a Wal-Mart retail center and large parking area. This recent development places considerable development pressure on nearby keystone properties.

1.4 Third Fork Creek Tributary - Subwatershed TFC2

The Third Fork Creek tributary subwatershed (identified as subwatershed TFC2 on the map) contains a mix of medium and low density residential, with non-residential land (e.g., commercial, industrial, and office) only in the most upstream portion of the watershed. The subwatershed includes the historic Hope Valley Golf Course (built in the 1920s) and surrounding neighborhood, which is considered very low density residential. Relatively new residential development exists along Martin Luther King, Jr. Parkway. The subwatershed contains a few school properties and no parks.

Fifteen keystone properties lie within this subwatershed, but no urban gems were identified here. One keystone property coincides with a proposed SCM retrofit. The relatively small number of riparian buffer protection opportunities exist because development has been occurring in this subwatershed for a long time. Only four of the keystone properties are fully vacant, but the others provide multiple benefits, such as protecting the floodplain, steep slopes, and wetlands. The largest keystone properties in the downstream portion of the watershed contain large areas of unmanaged forest.

1.5 Middle Third Fork Creek - Subwatershed TFC3

Similar to areas upstream, the Middle Third Fork Creek subwatershed (identified as subwatershed TFC1 on the map) contains a mix of medium and high density residential areas, with commercial, industrial, and office areas only along major transportation corridors. This subwatershed has also experienced new development in the past decade. Land along Harmony Road has been under development for about five years. Although this development is an indicator of development pressure, this subwatershed is likely to have less development pressure than the Upper and Lower Third Fork Creek subwatersheds where development appears to be more active. The subwatershed contains one school property and no parks.

Twenty-one (about 20%) of the keystone properties lie in the Middle Third Fork Creek subwatershed, but no urban gems were identified. Two keystone properties correspond with a proposed SCM retrofit. Only four of the keystone properties are fully vacant. All of the keystone properties are located within the floodplain, and almost all contain steep slopes and wetlands.

1.6 Lower Third Fork Creek - Subwatershed TFC1

The land use in this subwatershed is similar to the Middle Third Fork Creek subwatershed (identified as subwatershed TFC1 on the map) except that it contains large tracts of natural areas surrounding Jordan Lake owned by USACE as part of the lake's Wildlife Management Area. Areas of recent and historic beaver activity have been observed between Woodcroft Parkway and the confluence of Third Fork Creek with New Hope Creek (watershed outlet). Only one park and one school are located in this subwatershed.

A few major tracts have been developed in the past five years into high density residential and commercial land use. Additional vacant parcels zoned residential and commercial tracts are available for full development. Considerable development pressure exists within this subwatershed due to I-40, NC-54, NC-751, and existing development.

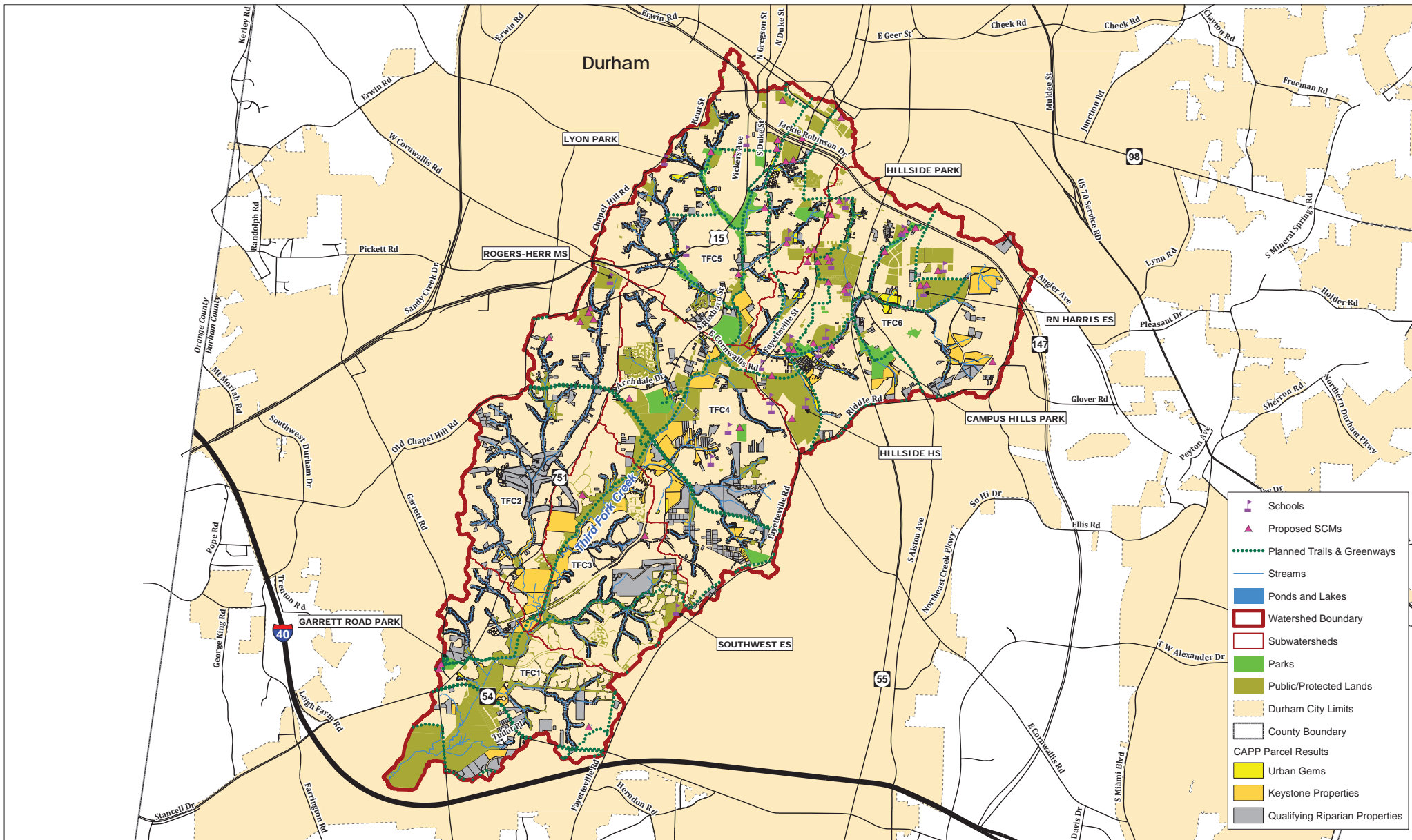
Nine keystone properties and one urban gem were identified in this watershed. One keystone property corresponds with a proposed SCM retrofit. About half of the keystone properties are fully vacant. Those that are partially developed still contain relatively large areas of unmanaged forest. Most of the keystone properties have steep slopes. The three large keystone properties in the subwatershed are along Third Fork Creek main stem and are critical to connecting the rest of the watershed to the sizeable Jordan Lake Wildlife Management Area. They also provide notable water quality and hydrology functions with large areas of floodplain wetland areas. A portion of one of these properties contains an area mowed for the soccer fields at Woodcroft Swim and Tennis Club, and this portion of land would not be considered a protection opportunity.

The single urban gem within the watershed contains an old house with a small portion of the property intersecting the main stem of Third Fork Creek. This property is unlikely to be as valuable as the other urban gems in the watershed that contain a larger percentage of stream frontage and have greater connectivity to other natural areas and public land. NOTE: This parcel was developed as an automotive service center in 2012.

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Third Fork Creek Watershed
Critical Area Protection Plan Map

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- Schools
- Proposed SCMs
- Planned Trails & Greenways
- Streams
- Ponds and Lakes
- Watershed Boundary
- Subwatersheds
- Parks
- Public/Protected Lands
- Durham City Limits
- County Boundary
- CAPP Parcel Results
- Urban Gems
- Keystone Properties
- Qualifying Riparian Properties

TABLES

Third Fork Creek Watershed

Table B-1. Keystone Property Parcel Scores

Table B-2. Urban Gem Parcel Scores

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Table B-1. Keystone Property Parcel Scores for Third Fork Creek Watershed (2010)

Keystone Property Parcel Scores for THIRD FORK CREEK WATERSHED																					
PID	Length of stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage *	Located in Priority Sub-basin	Vacancy Status	Parcel Area	Unmanaged Land Cover	Adjacent to Protected Park or Open Space	TOTAL SCORE
122367	1,822	4	0	0	1	1	1	1	1	0	0	0	1	1	1	2	2	2	1	2	20
196541	2,982	4	0	0	1	1	1	1	1	0	0	0	0	1	1	2	2	2	1	2	19
146335	1,523	4	0	0	0	0	1	1	1	0	0	0	1	1	1	2	2	2	1	2	18
135103	1,051	4	0	1	1	1	1	1	1	0	0	0	0	1	1	2	0	1	1	2	17
135307	1,647	4	0	0	1	1	1	1	1	0	0	0	0	1	1	2	0	2	1	2	17
145481	1,364	4	0	1	1	0	1	1	1	0	0	0	0	1	1	2	0	2	1	2	17
107193	723	2	0	1	1	0	1	1	1	0	0	1	1	0	1	2	2	0	1	2	16
135177	1,539	4	0	1	0	0	1	1	1	0	0	0	0	1	1	2	0	2	1	2	16
135498	2,272	4	0	0	0	1	1	1	1	0	0	0	0	1	1	2	0	2	1	2	16
135691	1,335	4	0	0	0	1	1	1	1	0	0	0	1	1	1	0	0	2	1	2	15
145491	2,463	4	0	0	1	1	1	1	1	0	0	0	0	1	1	0	0	2	1	2	15
196540	188	0	0	1	1	0	1	1	1	0	0	0	0	1	1	2	2	2	1	2	15
135497	2,270	4	0	0	0	1	1	1	1	0	0	0	0	1	1	2	0	2	1	0	14
156681	1,231	4	0	0	1	1	0	1	1	0	0	1	1	1	1	0	2	1	0	0	14
198505	907	2	0	0	1	1	1	1	1	0	0	0	0	1	1	2	0	2	0	2	14
206564	603	2	1	0	0	1	1	0	1	0	0	0	0	0	1	2	2	1	1	2	14
116410	104	0	0	1	1	0	1	1	1	0	0	1	1	1	1	2	2	0	1	0	13
133334	0	0	1	1	0	0	1	1	1	0	0	1	1	1	1	0	2	0	1	2	13
133338	0	0	1	1	0	0	1	1	1	0	0	1	1	1	1	0	2	0	1	2	13
133340	40	0	1	1	0	0	1	1	1	0	0	1	1	1	1	0	2	0	1	2	13
133350	74	0	1	1	0	0	1	1	1	0	0	1	1	1	1	0	2	0	1	2	13
134917	103	0	1	0	0	1	1	1	1	0	0	0	0	1	1	2	2	0	1	2	13
135113	896	2	0	0	0	0	1	1	0	0	0	0	0	1	1	2	2	1	1	2	13
135190	1,711	4	0	0	1	0	1	1	1	0	0	0	0	0	1	2	0	1	0	2	13
107404	0	0	0	0	0	0	1	1	1	0	0	0	1	1	1	0	2	2	1	2	12
122370	437	0	0	0	0	1	1	1	1	0	0	0	1	1	1	0	2	1	1	2	12

Keystone Property Parcel Scores for THIRD FORK CREEK WATERSHED

PID	Length of stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage *	Located in Priority Sub-basin	Vacancy Status	Parcel Area	Unmanaged Land Cover	Adjacent to Protected Park or Open Space	TOTAL SCORE
133358	140	0	0	1	0	0	1	1	1	0	0	1	1	1	1	0	2	0	1	2	12
133359	38	0	1	1	0	0	1	1	1	0	0	1	1	1	1	0	2	0	0	2	12
135692	518	2	0	0	0	1	1	1	1	0	0	0	0	1	1	2	0	2	1	0	12
143652	1,548	4	0	0	1	0	1	1	1	0	0	0	0	1	1	2	0	0	1	0	12
146337	270	0	0	0	0	1	1	1	1	0	0	0	1	0	1	2	2	2	1	0	12
116377	0	0	1	1	0	0	1	1	0	0	0	1	1	1	1	0	2	0	0	2	11
116392	383	0	1	1	1	0	1	1	1	0	0	1	1	1	1	2	0	0	0	0	11
116409	54	0	1	1	1	0	1	1	1	0	0	1	1	1	1	2	0	0	0	0	11
118835	117	0	0	0	0	1	0	1	1	0	0	1	1	1	1	0	0	2	1	2	11
124101	202	0	0	0	1	0	0	1	1	0	0	0	1	0	1	2	2	0	1	2	11
133335	0	0	1	0	0	0	1	1	0	0	0	1	1	1	1	0	2	0	1	2	11
133349	0	0	1	0	0	0	1	1	0	0	0	1	1	1	1	0	2	0	1	2	11
133357	0	0	1	0	0	0	1	1	0	0	0	1	1	1	1	0	2	0	1	2	11
133387	24	0	0	0	1	1	1	0	1	0	0	1	1	1	1	0	0	1	1	2	11
145116	1,175	4	0	0	0	0	1	1	1	0	0	0	0	1	1	0	0	0	1	2	11
145119	1,452	4	0	0	1	0	1	1	1	0	0	0	0	1	1	0	0	1	1	0	11
145550	250	0	1	0	1	0	1	1	1	0	0	0	0	1	1	2	0	0	1	2	11
206563	416	0	0	0	0	1	1	0	1	0	0	0	0	0	1	2	2	1	1	2	11
132824	0	0	1	0	0	0	0	0	1	0	0	0	1	1	1	2	2	0	0	2	10
133401	0	0	1	0	0	0	1	0	1	0	0	1	0	1	1	0	2	0	1	2	10
133511	37	0	1	0	1	1	0	0	1	0	0	1	0	1	1	0	2	0	0	2	10
134574	0	0	0	0	0	0	0	1	1	0	0	0	1	0	1	2	2	0	1	2	10
134915	76	0	1	0	0	1	1	1	1	0	0	0	0	1	1	2	0	0	0	2	10
135384	405	0	0	0	1	0	1	1	1	0	0	0	0	1	1	2	0	0	1	2	10
135688	898	2	0	0	0	0	1	1	1	0	0	0	0	1	1	0	2	1	1	0	10
156682	229	0	0	0	1	1	0	1	1	0	0	1	0	1	1	0	2	1	1	0	10
156727	935	2	0	0	0	1	0	1	1	0	0	0	0	0	1	0	2	2	1	0	10

Keystone Property Parcel Scores for THIRD FORK CREEK WATERSHED

PID	Length of stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage *	Located in Priority Sub-basin	Vacancy Status	Parcel Area	Unmanaged Land Cover	Adjacent to Protected Park or Open Space	TOTAL SCORE
199378	641	2	0	0	1	1	0	0	1	0	0	0	0	0	1	0	2	2	1	0	10
203345	104	0	0	0	0	0	1	1	1	0	0	0	0	0	1	2	2	0	1	2	10
208005	775	2	1	0	0	1	0	0	1	0	0	0	1	0	1	2	0	1	1	0	10
107199	0	0	0	0	0	0	1	1	1	0	0	0	1	1	1	0	0	1	1	2	9
116411	76	0	1	1	0	0	0	1	1	0	0	1	1	1	1	2	0	0	0	0	9
124076	0	0	0	0	1	0	1	1	0	0	0	0	0	1	1	2	0	0	1	2	9
132942	705	0	0	0	0	1	0	0	1	0	0	0	1	0	1	2	0	1	1	2	9
133337	0	0	1	0	0	0	1	1	0	0	0	1	1	1	1	0	2	0	1	0	9
133413	0	0	1	0	0	0	1	0	0	0	0	1	0	1	1	0	2	0	1	2	9
133414	49	0	1	0	0	0	1	0	1	0	0	1	0	1	1	0	2	0	0	2	9
134942	0	0	1	0	0	0	1	1	1	0	0	0	0	1	1	2	0	0	0	2	9
135125	354	0	0	0	1	0	1	1	1	0	0	0	0	1	1	0	2	0	0	2	9
135310	142	0	0	0	1	0	1	1	1	0	0	0	0	0	1	2	2	0	1	0	9
135693	302	0	1	0	0	0	1	1	1	0	0	0	1	1	1	0	2	0	1	0	9
135715	611	2	0	0	1	0	0	1	0	0	0	0	0	0	1	0	2	1	0	2	9
146377	179	0	1	0	0	1	0	0	1	0	0	0	1	0	1	2	2	0	1	0	9
146420	106	0	1	0	0	1	0	0	1	0	0	0	1	0	1	2	2	0	1	0	9
146421	39	0	1	0	0	1	0	0	1	0	0	0	1	0	1	2	2	0	1	0	9
146422	13	0	1	0	0	1	0	0	1	0	0	0	1	0	1	2	2	0	1	0	9
146793	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	2	2	1	1	2	9
196539	89	0	0	0	1	1	1	1	1	0	0	0	0	0	1	2	0	0	0	2	9
107544	0	0	0	0	0	0	0	1	1	0	0	0	1	1	1	0	2	0	0	2	8
115709	13	0	1	0	0	1	0	0	1	0	0	1	1	1	1	0	2	0	0	0	8
135226	0	0	1	0	0	0	1	1	1	0	0	0	0	0	1	2	0	0	0	2	8
135723	127	0	1	0	0	1	0	0	0	0	1	0	1	0	1	2	0	0	0	2	8
143602	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	1	1	2	8
145480	160	0	1	0	0	1	0	0	1	0	0	0	0	0	1	2	2	0	1	0	8

Keystone Property Parcel Scores for THIRD FORK CREEK WATERSHED

PID	Length of stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage *	Located in Priority Sub-basin	Vacancy Status	Parcel Area	Unmanaged Land Cover	Adjacent to Protected Park or Open Space	TOTAL SCORE
146342	110	0	0	0	0	1	0	0	1	0	0	0	1	0	1	2	2	0	1	0	8
146346	112	0	0	0	0	1	0	0	1	0	0	0	1	0	1	2	2	0	1	0	8
146419	107	0	1	0	0	1	0	0	1	0	0	0	0	0	1	2	2	0	1	0	8
147001	0	0	1	0	0	0	0	0	1	0	0	0	1	0	1	2	2	0	1	0	8
147002	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	2	2	0	1	0	8
156604	2,760	0	0	1	0	1	0	0	1	0	0	0	0	0	1	0	2	2	1	0	8
198514	123	0	0	0	0	1	1	1	1	0	0	0	0	0	1	2	2	0	0	0	8
208004	0	0	1	0	0	1	0	0	1	0	0	0	1	0	1	2	2	0	0	0	8
208027	12	0	1	0	0	1	0	0	1	0	0	0	1	0	1	2	2	0	0	0	8
107524	0	0	0	0	0	0	0	1	1	0	0	0	1	1	1	0	2	0	1	0	7
123582	52	0	1	0	1	0	0	1	1	0	0	1	0	0	1	0	2	0	0	0	7
133000	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	2	0	1	0	2	7
134912	84	0	1	0	0	1	1	1	1	0	0	0	0	0	1	2	0	0	0	0	7
134914	159	0	1	0	0	1	1	1	1	0	0	0	0	0	1	2	0	0	0	0	7
134930	0	0	1	0	0	0	0	1	1	0	0	0	0	0	1	2	0	0	0	2	7
134939	0	0	1	0	0	0	1	1	0	0	0	0	0	0	1	2	0	0	0	2	7
134940	0	0	1	0	0	0	0	1	0	0	0	0	0	1	1	2	0	0	0	2	7
135186	525	0	1	0	0	1	1	1	1	0	0	0	0	0	1	2	0	0	0	0	7
135224	0	0	1	0	0	0	1	1	0	0	0	0	0	0	1	2	0	0	0	2	7
135323	255	0	0	0	0	0	1	1	1	0	0	0	0	1	1	0	0	0	1	2	7
135446	85	0	1	0	1	0	1	1	1	0	0	0	0	0	1	2	0	0	0	0	7
135686	6	0	1	0	0	1	1	1	1	0	0	0	1	1	1	0	0	0	0	0	7
146345	122	0	0	0	0	1	0	0	1	0	0	0	0	0	1	2	2	0	1	0	7
146389	53	0	0	0	0	1	0	0	1	0	0	0	0	0	1	2	2	0	1	0	7
146403	523	0	0	0	0	1	0	0	1	0	0	0	0	0	1	2	2	0	1	0	7
146418	92	0	1	0	0	1	0	0	1	0	0	0	0	0	1	2	2	0	0	0	7
146995	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	2	2	0	1	0	7

Keystone Property Parcel Scores for THIRD FORK CREEK WATERSHED

PID	Length of stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage *	Located in Priority Sub-basin	Vacancy Status	Parcel Area	Unmanaged Land Cover	Adjacent to Protected Park or Open Space	TOTAL SCORE
146996	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	2	2	0	1	0	7
146997	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	2	2	0	1	0	7
146999	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	2	2	0	1	0	7
147000	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	2	2	0	1	0	7
196348	951	2	0	0	0	0	0	0	1	0	0	0	0	0	1	2	0	1	1	0	7
202581	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	2	2	0	1	0	7
203342	82	0	1	0	0	1	1	1	1	0	0	0	0	0	1	2	0	0	0	0	7
203343	15	0	1	0	0	1	1	1	1	0	0	0	0	0	1	2	0	0	0	0	7
203344	68	0	1	0	0	1	1	1	1	0	0	0	0	0	1	2	0	0	0	0	7
206188	10	0	0	0	0	0	1	0	1	0	0	0	0	0	1	2	2	0	1	0	7
207962	41	0	1	0	0	0	0	0	1	0	0	0	1	0	1	2	2	0	0	0	7
207966	3	0	1	0	0	0	0	0	1	0	0	0	1	0	1	2	2	0	0	0	7
208015	0	0	1	0	0	0	0	0	1	0	0	0	1	0	1	2	2	0	0	0	7
208028	0	0	1	0	0	0	0	0	1	0	0	0	1	0	1	2	2	0	0	0	7
210033	0	0	0	0	0	0	0	0	1	0	0	1	1	1	1	0	2	0	0	0	6
209283	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	2

*NOTE: Score for Riparian Vegetation Coverage criterion not included in Total Score. A score of "1" indicates the parcel satisfies the minimum threshold for this parameter (where at least 50 percent of the critical land area within the riparian buffer of the parcel was forested or unmanaged scrub shrub)

Table B-2. Urban Gem Parcel Scores for Third Fork Creek Watershed (2010)

Urban Gem Parcel Scores for THIRD FORK CREEK WATERSHED																					
PID	Length of stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage*	Located in Priority Sub-basin	Vacancy Status	Parcel Area	Unmanaged Land Cover	Adjacent to Protected Park or Open Space	TOTAL SCORE
133429	473	0	1	1	1	1	0	0	1	0	0	1	0	1	1	0	2	0	1	2	12
116414	146	0	0	0	0	1	1	1	1	0	0	1	1	1	1	0	2	0	0	2	11
133266	258	0	0	1	1	1	1	1	1	0	0	1	1	1	1	0	0	0	0	2	11
107729	108	0	1	0	1	1	0	1	1	0	0	0	0	1	1	0	2	0	1	0	9
117793	472	0	0	0	0	1	0	1	1	0	0	1	1	1	1	0	2	0	1	0	9
132851	438	0	0	0	0	1	0	1	1	0	0	1	1	1	1	0	2	0	1	0	9
201990	75	0	0	1	0	1	0	0	1	0	0	0	1	0	1	0	2	0	1	2	9
107660	127	0	0	0	1	1	0	1	1	0	0	0	1	1	1	0	2	0	0	0	8
116094	24	0	1	0	0	1	0	0	1	0	0	0	0	1	1	0	2	0	0	2	8
116095	61	0	1	0	0	1	0	0	1	0	0	0	0	1	1	0	2	0	0	2	8
117212	141	0	1	1	0	1	0	0	1	0	0	1	1	0	1	0	2	0	0	0	8
133263	39	0	1	0	0	1	0	0	1	0	0	1	1	0	1	0	2	0	1	0	8
133264	0	0	1	0	0	1	0	0	1	0	0	1	1	0	1	0	2	0	1	0	8
133371	168	0	1	0	0	1	0	0	1	0	0	1	1	0	1	0	2	0	1	0	8
146794	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	2	2	0	1	2	8
206384	0	0	1	0	0	1	0	1	1	0	0	0	1	1	1	0	2	0	0	0	8
107107	329	0	1	0	1	1	0	1	1	0	0	0	1	1	1	0	0	0	0	0	7
107303	674	2	0	1	0	1	0	0	1	0	0	1	0	1	1	0	0	0	0	0	7
115038	5	0	1	0	0	1	0	0	1	0	0	1	1	0	1	0	2	0	0	0	7
115252	87	0	1	0	0	1	0	0	1	0	0	0	1	1	1	0	0	0	0	2	7
115407	96	0	1	0	0	1	0	0	1	0	0	1	1	0	1	0	2	0	0	0	7
115425	410	0	1	0	0	1	0	0	1	0	0	0	1	1	1	0	2	0	0	0	7
115491	12	0	0	0	0	1	0	0	1	0	0	1	1	1	1	0	2	0	0	0	7

Urban Gem Parcel Scores for THIRD FORK CREEK WATERSHED																					
PID	Length of stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage*	Located in Priority Sub-basin	Vacancy Status	Parcel Area	Unmanaged Land Cover	Adjacent to Protected Park or Open Space	TOTAL SCORE
115694	516	0	1	0	0	1	0	1	1	0	0	1	1	1	1	0	0	0	0	0	7
116007	81	0	1	1	0	1	0	0	1	0	0	0	1	0	1	0	2	0	0	0	7
117796	343	0	1	0	0	1	0	0	1	0	0	1	0	0	1	0	2	0	1	0	7
118107	255	0	1	1	0	1	0	0	1	0	0	1	1	1	1	0	0	0	0	0	7
118287	46	0	1	0	0	1	0	0	1	0	0	1	1	0	1	0	2	0	0	0	7
118313	7	0	1	0	0	1	0	0	1	0	0	1	1	0	1	0	2	0	0	0	7
118316	20	0	1	0	0	1	0	0	1	0	0	1	1	0	1	0	2	0	0	0	7
118320	60	0	1	0	0	1	0	0	1	0	0	1	1	0	1	0	2	0	0	0	7
118636	21	0	1	0	1	1	0	0	1	0	0	0	1	0	1	0	2	0	0	0	7
118637	67	0	1	0	1	1	0	0	1	0	0	0	1	0	1	0	2	0	0	0	7
119425	995	0	1	1	1	1	0	0	1	0	0	0	1	1	1	0	0	0	0	0	7
119453	53	0	1	0	1	1	0	0	1	0	0	0	1	0	1	0	2	0	0	0	7
119460	6	0	1	1	1	1	0	0	1	0	0	0	1	1	1	0	0	0	0	0	7
132744	40	0	1	0	0	1	0	0	1	0	0	1	1	0	1	2	0	0	0	0	7
133184	143	0	1	0	0	1	0	0	1	0	0	0	1	0	1	0	2	0	1	0	7
133198	0	0	1	0	0	1	0	0	1	0	0	1	1	0	1	0	2	0	0	0	7
133201	75	0	1	0	0	1	0	0	1	0	0	1	1	0	1	0	2	0	0	0	7
133203	109	0	1	0	0	1	0	0	1	0	0	1	0	0	1	0	2	0	1	0	7
133204	34	0	1	0	0	1	0	0	1	0	0	1	0	0	1	0	2	0	1	0	7
201750	123	0	1	0	0	1	0	0	1	0	0	0	1	1	1	0	2	0	0	0	7
107377	113	0	1	0	0	1	0	0	1	0	0	0	1	0	1	0	2	0	0	0	6
107378	72	0	1	0	0	1	0	0	1	0	0	0	1	0	1	0	2	0	0	0	6
107380	40	0	1	0	0	1	0	0	1	0	0	0	1	0	1	0	2	0	0	0	6
107678	0	0	1	0	0	1	0	1	1	0	0	0	1	1	1	0	0	0	0	0	6
107930	38	0	1	0	0	1	0	0	1	0	0	0	1	0	1	0	2	0	0	0	6
107954	4	0	1	0	0	1	0	0	1	0	0	0	1	0	1	0	2	0	0	0	6

Urban Gem Parcel Scores for THIRD FORK CREEK WATERSHED																					
PID	Length of stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage*	Located in Priority Sub-basin	Vacancy Status	Parcel Area	Unmanaged Land Cover	Adjacent to Protected Park or Open Space	TOTAL SCORE
107998	168	0	1	0	0	1	0	0	1	0	0	0	1	0	1	0	2	0	0	0	6
108036	446	0	1	0	0	1	0	0	1	0	0	0	1	0	1	0	2	0	0	0	6
108037	132	0	1	0	0	1	0	0	1	0	0	0	1	0	1	0	2	0	0	0	6
108443	88	0	1	0	0	1	0	0	1	0	0	0	1	0	1	0	2	0	0	0	6
108449	163	0	1	0	0	1	0	0	1	0	0	0	1	0	1	0	2	0	0	0	6
108452	57	0	1	0	0	1	0	0	1	0	0	0	1	0	1	0	2	0	0	0	6
108460	22	0	1	0	0	1	0	0	1	0	0	0	1	0	1	0	2	0	0	0	6
114749	85	0	1	0	0	1	0	0	1	0	0	0	1	0	1	0	2	0	0	0	6
114786	202	0	1	0	0	1	0	0	1	0	0	0	1	0	1	0	2	0	0	0	6
115266	11	0	0	1	1	1	0	0	1	0	0	0	1	1	1	0	0	0	0	0	6
115823	58	0	1	0	0	1	0	0	1	0	0	0	1	0	1	0	2	0	0	0	6
115825	51	0	1	0	0	1	0	0	1	0	0	0	1	0	1	0	2	0	0	0	6
115826	50	0	1	0	0	1	0	0	1	0	0	0	1	0	1	0	2	0	0	0	6
115827	54	0	1	0	0	1	0	0	1	0	0	0	1	0	1	0	2	0	0	0	6
115843	164	0	1	0	0	1	0	0	1	0	0	0	1	0	1	0	2	0	0	0	6
116092	49	0	1	0	0	1	0	0	1	0	0	0	0	1	1	0	2	0	0	0	6
116093	97	0	1	0	0	1	0	0	1	0	0	0	0	1	1	0	2	0	0	0	6
117206	10	0	1	1	0	1	0	0	1	0	0	1	1	0	1	0	0	0	0	0	6
117207	76	0	1	1	0	1	0	0	1	0	0	1	1	0	1	0	0	0	0	0	6
118658	88	0	1	0	0	1	0	0	1	0	0	0	1	0	1	0	2	0	0	0	6
119463	378	0	0	1	1	1	0	0	1	0	0	0	1	1	1	0	0	0	0	0	6
132952	429	0	1	0	0	1	0	0	1	0	0	0	1	0	1	2	0	0	0	0	6
133172	62	0	1	0	0	1	0	0	1	0	0	0	1	0	1	0	2	0	0	0	6
133177	148	0	1	0	0	1	0	0	1	0	0	0	1	0	1	0	2	0	0	0	6
133202	50	0	1	0	0	1	0	0	0	0	0	1	1	0	1	0	2	0	0	0	6
133257	87	0	0	0	0	1	0	0	1	0	0	1	1	0	1	0	2	0	0	0	6

Urban Gem Parcel Scores for THIRD FORK CREEK WATERSHED																					
PID	Length of stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage*	Located in Priority Sub-basin	Vacancy Status	Parcel Area	Unmanaged Land Cover	Adjacent to Protected Park or Open Space	TOTAL SCORE
135702	93	0	0	1	0	1	0	0	1	0	0	0	1	0	1	0	2	0	0	0	6
146192	0	0	1	0	0	0	0	0	1	0	0	0	0	0	1	2	0	0	0	2	6
200847	143	0	1	0	0	1	0	0	1	0	0	1	1	0	1	0	0	0	1	0	6

*NOTE: Score for Riparian Vegetation Coverage criterion not included in Total Score. A score of "1" indicates the parcel satisfies the minimum threshold for this parameter (where at least 50 percent of the critical land area within the riparian buffer of the parcel was forested or unmanaged scrub shrub)

Appendix C

Critical Area Protection Plan for the Northeast Creek Watershed

Completed in 2012

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1.0 Results

Based on the initial assessment of qualifying parcels within the city limits, and the scores assigned for the baseline and priority criteria, 90 keystone properties and 12 urban gems were identified in the Northeast Creek watershed. The watershed-scale map provided in this appendix presents all the qualifying parcels, the keystone properties, the urban gems, and schools, parks, and other protected or public lands. Tables C-1 and C-2 provide the individual scores for each keystone property and urban gem for the baseline and priority criteria. A detailed summary of critical area protection and preservation opportunities are discussed below in the three major subwatersheds: Durham subwatershed, RTP subwatershed, and Southern subwatershed.

NOTE: The current availability of identified parcels should be evaluated when using this report.

KEYSTONE *properties are the highest-priority parcels identified for protection in each watershed that can expand high-quality riparian areas that are already protected, such as existing parks, or that could serve as parcels around which larger protected areas might be built.*

URBAN GEMS *are properties that contain high-quality riparian areas in heavily urbanized portions of each watershed which are isolated or lack connectivity to other protected open spaces. Although Urban Gems would not qualify as a keystone property, they still hold specific individual characteristics that are deemed particularly worthy of protection.*

1.1 Durham Subwatershed

The Durham subwatershed consists of the portion of the watershed that is primarily within the Durham city limits. This subwatershed covers approximately 9,400 acres of land and is highly developed. The GIS analysis identified 86 keystone properties and 11 urban gems in this subwatershed. Thirty-three proposed SCM retrofit sites are proposed in this subwatershed, but only two coincide with keystone properties or urban gems.

Within this subwatershed, there are many properties that warrant further investigation. Two examples are a keystone property and an adjacent urban gem, (PIN 0728-04-94-8117.L00 and PIN 0728-04-94-0147) that share a stream that serves as the property boundary. These parcels are 23.0 acres and 35.0 acres, respectively, with dense vegetation covering approximately half of each parcel. The remainder of each parcel contains residential development. There is a stream branch in the urban gem parcel that has been determined to be ideal for preservation through field verification. This parcel is the site of four proposed new SCMs and is located roughly one-half mile from schools.

1.2 RTP Subwatershed

The RTP subwatershed consists primarily of the jurisdictional area of Research Triangle Park (RTP) with smaller areas within the Durham city limits. This subwatershed covers approximately 8,300 acres of land. The GIS analysis identified four keystone properties and one urban gem in this subwatershed. The low number of properties identified is due to the small portion of this subwatershed that lies within the Durham city limits. There are no proposed SCM retrofit sites within this subwatershed.

Most of the keystone properties identified in this sub-region are relatively small compared to keystone properties in other sub-regions. The urban gem (PIN 0737-01-49-6318) contains a headwater stream but is not densely vegetated.

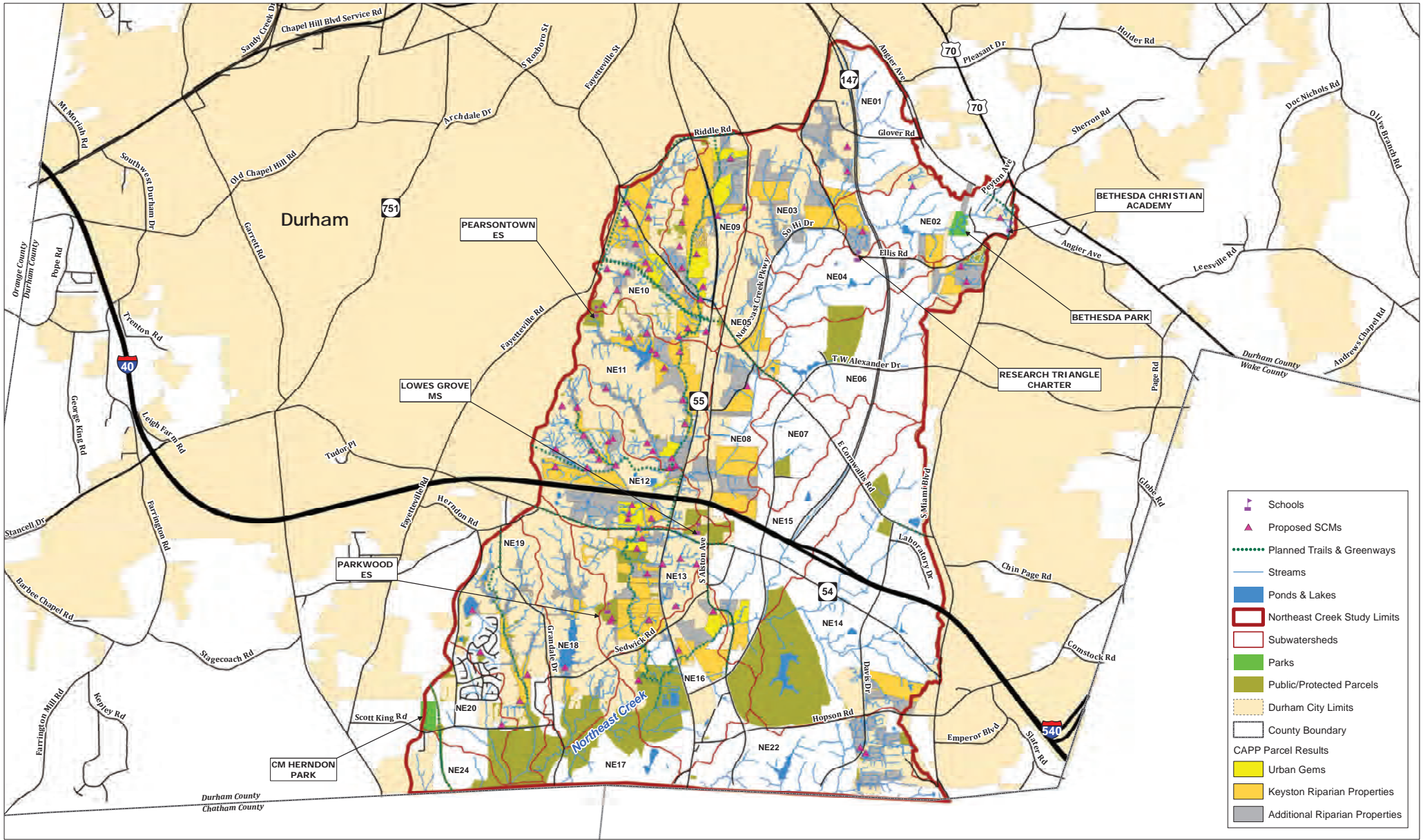
1.3 Southern Subwatershed

The Southern subwatershed covers approximately 4,800 acres of land that is almost entirely within Durham, Chatham, and Wake counties. No keystone properties or urban gems were identified because

nearly all of the land in this subwatershed lies outside the Durham city limits. The USACE owns large expanses of undeveloped land around Jordan Lake as part of the lake's Wildlife Management Area.

Northeast Creek Watershed
Critical Area Protection Plan Map

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TABLES

Northeast Creek Watershed

Table C-1. Keystone Property Parcel Scores

Table C-2. Urban Gem Parcel Scores

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Table C-1. Keystone Property Parcel Scores for Northeast Creek Watershed (2012)

Keystone Property Parcel Scores for NORTHEAST CREEK WATERSHED																				
PID	Length of stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage	Vacancy Status	Parcel Area	Adjacent to Protected Park or Open Space	Unmanaged Land Cover	TOTAL SCORE
153813	3,174	4	0	1	1	1	1	1	1	1	1	1	0	1	2	2	2	1	1	22
153767	1,095	4	0	1	1	1	1	1	1	1	0	1	0	1	2	2	2	1	1	21
201859	1,342	4	0	1	1	1	1	1	1	1	1	0	0	1	2	2	2	1	1	21
153843	1,628	4	0	1	1	1	1	1	0	1	1	0	0	1	2	2	2	1	1	20
153809	516	2	0	1	1	1	1	1	1	1	0	1	0	1	2	2	2	1	1	19
208412	1,359	4	0	1	1	1	1	1	1	0	0	0	0	1	2	2	2	0	1	18
153789	1,162	4	0	1	1	1	1	1	0	1	0	1	0	1	2	0	2	1	1	18
153777	1,088	4	0	1	1	1	1	1	0	1	0	1	0	1	2	0	2	1	1	18
151889	1,618	4	0	1	0	1	1	1	1	0	0	0	0	1	2	2	2	0	1	17
153811	467	0	0	1	1	1	1	1	1	1	0	1	0	1	2	2	2	1	1	17
153810	419	0	0	1	1	1	1	1	1	1	0	1	0	1	2	2	2	1	1	17
154276	1,913	4	0	1	0	0	1	1	1	0	0	1	0	1	2	2	2	0	1	17
154333	3,242	4	0	1	1	0	0	1	1	0	0	0	0	1	2	2	2	0	1	16
154025	2,017	4	0	1	0	1	1	1	1	1	0	0	0	1	2	0	2	0	1	16
197063	1,458	4	0	1	1	0	0	1	1	0	0	0	0	1	2	2	2	0	1	16
163368	1,128	4	0	1	1	1	1	0	1	0	0	0	0	0	2	2	2	0	1	16
208066	1,066	4	0	1	0	1	1	1	1	0	0	0	0	1	2	2	0	0	1	15
154433	1,166	4	0	1	0	0	1	1	1	0	0	0	1	1	2	0	2	0	1	15
154824	1,497	4	0	1	0	1	0	1	1	0	0	0	0	1	2	2	1	0	1	15
153187	587	2	0	1	0	0	1	1	1	1	0	0	0	1	2	2	1	1	1	15
200380	538	2	0	1	1	1	1	0	1	0	0	1	0	0	2	2	2	0	1	15
154034	1,657	4	0	1	0	1	1	1	1	1	0	0	0	1	2	0	2	0	0	15

Keystone Property Parcel Scores for NORTHEAST CREEK WATERSHED																				
PID	Length of stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage	Vacancy Status	Parcel Area	Adjacent to Protected Park or Open Space	Unmanaged Land Cover	TOTAL SCORE
155086	1,083	4	0	1	0	0	0	1	1	0	0	0	0	1	2	2	1	1	1	15
156524	1,891	4	0	1	1	1	0	0	1	0	0	0	0	0	2	2	2	0	1	15
163370	2,478	4	0	1	0	1	1	0	1	0	0	0	0	0	2	2	2	0	1	15
163354	1,493	4	0	1	0	1	0	1	1	0	0	0	0	0	2	2	2	0	1	15
209136	115	0	0	1	1	1	1	1	0	1	1	1	0	0	2	2	1	0	1	14
153878	575	2	0	1	1	0	1	1	0	1	0	0	0	1	2	2	1	1	0	14
133841	2,733	4	0	1	0	1	0	1	1	0	0	0	0	1	2	0	2	0	1	14
133833	1,078	4	0	1	0	1	1	1	1	0	0	0	0	1	2	0	2	0	0	14
133832	1,317	4	0	1	0	1	0	1	1	0	0	0	0	0	2	2	1	0	1	14
153854	802	2	0	1	0	0	1	1	1	1	1	0	0	1	2	0	2	0	1	14
157216	1,740	4	0	1	0	1	1	1	1	0	0	0	0	0	2	0	2	0	1	14
133810	1,868	4	0	1	1	0	0	1	1	0	0	0	0	1	2	0	2	0	1	14
155355	2,482	4	0	1	0	1	0	1	1	0	0	0	0	1	2	0	2	0	1	14
155784	1,561	4	0	1	0	1	0	1	1	0	0	0	0	1	2	0	2	0	1	14
155776	889	2	0	1	0	1	0	1	1	0	0	0	0	1	2	2	1	1	1	14
157083	1,246	4	0	0	0	1	0	1	1	0	0	0	0	0	2	2	2	0	1	14
156989	1,247	4	0	1	0	0	0	1	1	0	0	0	0	0	2	2	2	0	1	14
163389	827	2	0	1	1	1	1	0	1	0	0	1	1	0	2	0	2	0	1	14
163598	992	2	0	1	1	0	0	1	1	0	0	1	0	0	2	2	2	0	1	14
156517	2,103	4	0	1	0	1	0	0	1	0	0	0	0	0	2	2	2	0	1	14
208045	845	2	0	1	0	0	1	1	1	0	0	0	0	1	2	2	1	0	1	13
151977	590	2	0	1	0	1	1	1	1	0	0	0	0	1	2	2	0	0	1	13
178366	962	2	0	1	1	0	0	1	0	1	1	0	0	0	2	2	1	0	1	13

Keystone Property Parcel Scores for NORTHEAST CREEK WATERSHED																				
PID	Length of stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage	Vacancy Status	Parcel Area	Adjacent to Protected Park or Open Space	Unmanaged Land Cover	TOTAL SCORE
153337	976	2	0	0	0	1	1	1	0	1	0	1	0	0	2	2	1	0	1	13
195970	26	0	0	1	0	1	1	1	1	0	1	0	0	1	2	2	0	1	1	13
208606	60	0	0	1	1	0	1	1	1	0	1	0	0	1	2	2	0	1	1	13
153858	630	2	0	1	0	1	1	1	0	1	0	0	0	1	2	2	0	0	1	13
154028	1,017	4	0	1	0	0	1	1	0	1	0	0	0	1	2	0	1	0	1	13
157160	3,817	4	0	0	0	1	1	1	1	0	0	0	0	0	2	0	2	0	1	13
155349	1,009	4	0	1	0	1	0	0	1	0	0	0	0	0	2	2	2	0	0	13
155352	518	2	0	1	0	1	0	1	1	0	0	0	0	1	2	2	1	0	1	13
155777	754	2	0	1	0	0	0	1	1	0	0	0	0	1	2	2	1	1	1	13
157097	797	2	0	1	0	1	1	1	1	0	0	0	0	0	2	2	1	0	1	13
202319	713	2	0	1	0	1	1	1	0	0	0	0	0	1	2	2	0	0	1	12
153335	1,056	4	0	0	0	1	0	1	0	1	0	1	0	0	2	0	1	0	1	12
196031	47	0	0	1	1	0	1	1	1	0	1	0	0	0	2	2	0	1	1	12
151331	430	0	0	1	1	0	1	1	1	1	1	0	0	0	2	2	0	0	1	12
154368	496	0	0	1	0	1	0	1	1	0	0	0	0	1	2	2	2	0	1	12
153896	593	2	0	1	0	0	1	1	1	1	0	0	0	1	2	0	1	0	1	12
133858	1,068	4	0	1	0	0	0	1	1	0	0	0	0	0	2	0	1	1	1	12
154339	703	2	0	1	0	0	1	1	0	0	0	1	0	0	2	2	1	0	1	12
155371	1,219	4	0	1	0	1	1	0	1	0	0	0	0	0	2	0	1	0	1	12
197863	553	2	0	1	0	0	0	1	1	0	0	0	0	1	2	2	0	0	1	11
150074	674	2	0	0	0	1	1	0	1	0	0	0	0	1	2	2	0	0	1	11
153167	769	2	0	0	0	1	0	0	0	1	0	0	0	1	2	2	1	0	1	11
153780	472	0	0	1	1	1	1	1	0	1	0	0	0	1	2	0	1	1	0	11

Keystone Property Parcel Scores for NORTHEAST CREEK WATERSHED

PID	Length of stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage	Vacancy Status	Parcel Area	Adjacent to Protected Park or Open Space	Unmanaged Land Cover	TOTAL SCORE
133862	628	2	0	1	0	0	0	1	1	0	0	0	0	0	2	2	1	0	1	11
155374	758	2	0	0	1	0	0	0	1	0	0	1	0	0	2	2	1	0	1	11
153816	251	0	0	1	1	1	1	1	0	1	1	1	0	0	2	0	0	0	1	11
153817	1	0	0	1	1	1	1	1	0	1	1	1	0	0	2	0	1	0	0	11
157220	576	2	0	1	0	0	0	1	0	0	0	0	0	1	2	2	1	0	1	11
154141	106	0	0	0	0	1	0	1	1	0	0	1	0	0	2	2	2	0	1	11
155342	604	2	0	1	0	0	0	1	1	0	0	0	0	1	2	0	2	0	1	11
155949	506	2	0	1	0	0	1	1	0	0	0	0	0	0	2	2	1	0	1	11
157842	707	2	0	0	0	1	1	1	1	0	0	0	0	0	2	0	2	0	1	11
133811	258	0	0	1	0	0	0	1	1	0	0	0	0	1	2	2	2	0	1	11

Table C-2. Urban Gem Parcel Summary for Northeast Creek Watershed (2012)

Urban Gem Parcel Scores for NORTHEAST CREEK WATERSHED																				
PID	Length of stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage	Vacancy Status	Parcel Area	Adjacent to Protected Park or Open Space	Unmanaged Land Cover	TOTAL SCORE
153945	1,020	4	0	1	1	1	1	1	0	1	0	0	0	1	2	0	2	1	1	17
154012	1,300	4	0	1	0	1	1	1	0	1	0	0	0	1	2	2	2	0	1	17
154275	1,130	4	0	1	1	1	1	1	1	0	0	0	0	1	2	0	2	0	1	16
154336	1,202	4	0	1	0	1	1	1	0	0	0	0	0	1	2	2	1	0	1	15
154011	904	2	0	1	0	1	1	1	0	1	0	0	0	1	2	2	1	0	1	14
154210	844	2	0	1	0	1	1	1	0	0	0	0	0	1	2	2	2	0	1	14
155782	1,053	4	0	1	0	1	0	1	1	0	0	0	0	0	2	0	2	1	1	14
133814	1,470	4	0	1	0	1	0	1	1	0	0	0	0	1	2	0	2	0	1	14
156529	1,394	4	0	1	1	1	0	1	1	0	0	0	0	1	2	0	2	0	0	14
154035	474	0	0	1	0	1	1	1	0	1	0	0	0	1	2	0	2	0	1	11
155756	729	2	0	1	0	1	0	1	1	0	0	0	0	1	2	0	1	0	1	11

Appendix D

Critical Area Protection Plan for the Crooked Creek Watershed

Completed in 2012

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1.0 Results

The Crooked Creek watershed covers approximately 2,300 acres of land and is located on the western side of the Northeast Creek watershed. Based on the initial assessment of qualifying parcels within the city limits, and the scores assigned for the baseline and priority criteria, 12 keystone properties and five urban gems were identified in the Crooked Creek watershed. The watershed-scale map provided in this appendix presents all the qualifying parcels, the keystone properties, the urban gems, and schools, parks, and other protected or public lands. Tables D-1 and D-2 provide the individual scores for each keystone property and urban gem for the baseline and priority criteria.

NOTE: The current availability of identified parcels should be evaluated when using this report.

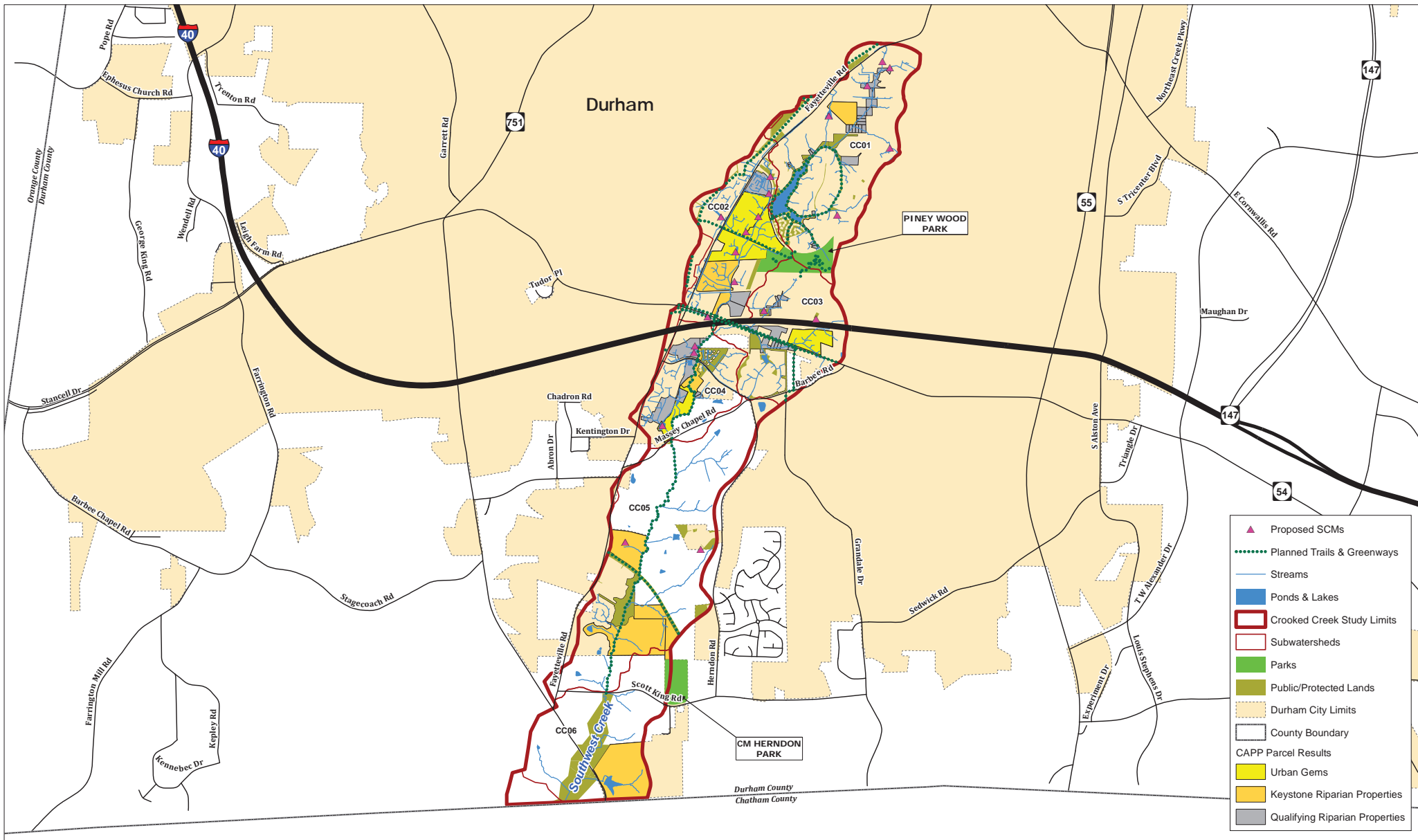
Four of the keystone properties identified by the analysis are ideal for preservation. The properties (PIN 0717-02-65-6754, PIN 0717-02-76-3629, PIN 0717-04-85-5883, and PIN 0717-02-75-8569) are densely covered with vegetation and have streams located within the properties. The properties are adjacent to each other and cover a total area of 94.6 acres, ranging in size from 10.3 acres to 42.8 acres. Due to the location of the stream in the center of these parcels, the vegetated buffer on each side of the stream could be preserved. One of the parcels is adjacent to Herndon Park, which would provide an opportunity to expand this park.

KEYSTONE properties are the highest-priority parcels identified for protection in each watershed that can expand high-quality riparian areas that are already protected, such as existing parks, or that could serve as parcels around which larger protected areas might be built.

URBAN GEMS are properties that contain high-quality riparian areas in heavily urbanized portions of each watershed which are isolated or lack of connectivity to other protected open spaces. Although Urban Gems would not qualify as a keystone property, they still hold specific individual characteristics that are deemed particularly worthy of protection.

Crooked Creek Watershed
Critical Area Protection Plan Map

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TABLES

Crooked Creek Watershed

Table D-1. Keystone Property Parcel Scores

Table D-2. Urban Gem Parcel Scores

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Table D-1. Keystone Property Parcel Scores for Crooked Creek Watershed (2012)

Keystone Property Parcel Scores for CROOKED CREEK WATERSHED																				
PID	Length of Stream in Parcel (LF)	Length of Stream	Not Protected by Jordan Buffer Rules	Proximity to BMP	Ideal for Preservation	Headwater Stream	Wetlands present	Floodplain Present	Steep Slopes Present	Proximity to NCNHP element occurrence	Proximity to SNHA	Proximity to school	Proximity to park	Proximity Greenway	Riparian vegetation coverage	Vacancy Status	Site Size	Protected Public land	Unmanaged Forest Land	TOTAL SCORE
210132	1,697	4	0	1	0	0	1	1	1	0	0	0	0	1	2	2	2	1	1	17
149989	1,324	4	0	1	1	1	1	1	1	0	0	0	0	1	2	2	1	0	1	17
203351	910	2	0	0	0	1	1	1	1	0	0	0	1	1	2	2	2	0	1	15
150749	5,127	4	0	0	0	1	1	0	1	0	0	0	1	1	2	0	2	1	1	15
148146	1,487	4	0	1	0	1	0	1	0	0	0	0	1	0	2	2	1	0	1	14
150278	599	2	0	1	0	0	1	1	1	0	0	0	0	1	2	0	2	1	1	13
149549	1,120	4	0	1	0	0	1	1	1	0	0	0	1	0	2	0	2	0	0	13
150718	1,159	4	0	0	0	1	0	0	0	0	0	0	1	1	2	0	2	1	0	12
147361	106	0	0	1	0	1	1	1	0	0	0	1	0	0	2	2	2	0	1	12
211331	374	0	0	0	0	0	1	1	1	0	0	0	0	1	2	2	2	0	1	11
149563	530	2	0	1	0	0	1	1	0	0	0	0	0	1	2	2	0	0	1	11
148692	705	2	0	1	0	0	0	1	1	0	0	1	0	0	2	2	0	0	1	11

Table D-2. Urban Gem Parcel Scores for Crooked Creek Watershed (2012)

Urban Gem Parcel Scores for CROOKED CREEK WATERSHED																				
PID	Length of Stream in Parcel (LF)	Length of Stream	Not Protected by Jordan Buffer Rules	Proximity to BMP	Ideal for Preservation	Headwater Stream	Wetlands present	Floodplain Present	Steep Slopes Present	Proximity to NCNHP element occurrence	Proximity to SNHA	Proximity to school	Proximity to park	Proximity Greenway	Riparian vegetation coverage	Vacancy Status	Site Size	Protected Public land	Unmanaged Forest Land	TOTAL SCORE
208081	1,310	4	0	1	0	1	1	1	1	0	0	0	0	1	2	2	2	0	1	17
148156	1,403	4	0	1	0	1	0	1	1	0	0	0	1	1	2	0	2	1	0	15
148153	1,599	4	0	1	0	1	0	1	1	0	0	0	1	1	2	0	2	1	0	15
152813	1,285	4	0	1	0	1	0	0	1	0	0	0	0	1	2	0	2	0	1	13
148155	759	2	0	1	0	1	0	1	1	0	0	0	1	1	2	0	2	0	0	12

Appendix E

Critical Area Protection Plan for the Little Lick Creek Watershed

Completed in 2015

1.0 Results

The Little Lick Creek watershed has several unique characteristics that affected the selection of keystone properties and urban gems for the Critical Area Protection Plan when compared to the City's other watersheds:

- Approximately 60% of the watershed lies outside of the Durham city limits. No keystone properties or urban gems were identified in areas that are currently within Durham County's jurisdiction.
- Most of the watershed (over 90%) lies within the Falls Lake Critical Area or the Falls Lake Protection Area watershed overlay zones. Based on Section 8.5.4.B.1 of the UDO, riparian buffers must be protected within 100 feet of the top of bank of all intermittent streams, perennial streams, modified natural streams, lakes, and ponds including beaver ponds. Most of the forested riparian buffers that exist in undeveloped or underdeveloped areas of the watershed will be protected by these development standards.
- In many cases where residential development has occurred along Little Lick Creek or Chunky Pipe Creek, the stream and its riparian buffer and floodplain were designated as "common areas" within the development during the site plan approval process, thereby providing the riparian buffers with an important level of protection even though they remain privately owned. Based on this designation, these areas were excluded from assessment for keystone properties and urban gems.
- A significant area of undeveloped land that contains stream channels, riparian wetlands, and forested riparian buffers within 2 miles of Falls Lake (east of Fletchers Chapel Road and Stallings Road) is owned by the USACE as part of the Falls Lake State Recreation Area.

KEYSTONE properties are the highest-priority parcels identified for protection in each watershed that can expand high-quality riparian areas that are already protected, such as existing parks, or that could serve as parcels around which larger protected areas might be built.

URBAN GEMS are properties that contain high-quality riparian areas in heavily urbanized portions of each watershed which are isolated or lack connectivity to other protected open spaces. Although Urban Gems would not qualify as a keystone property, they still hold specific individual characteristics that are deemed particularly worthy of protection.

Approximately 4,600 acres of the Little Lick Creek watershed lies within the Durham city limits. Based on the initial assessment of qualifying parcels within the city limits, and the scores assigned for the baseline and priority criteria, 49 keystone properties and 13 urban gems were identified in the Little Lick Creek watershed. The watershed-scale map provided in this appendix presents all the qualifying parcels, the keystone properties, the urban gems, and schools, parks, and other protected or public lands. Tables E-1 and E-2 provide the individual scores for each keystone property and urban gem for the baseline and priority criteria. A detailed summary of critical area protection and preservation opportunities are discussed below for the riparian buffers along Chunky Pipe Creek and Little Lick Creek.

NOTE: The current availability of identified parcels should be evaluated when using this report.

1.1 Chunky Pipe Creek

Based on the results for the baseline and priority criteria, 10 keystone properties were identified along Chunky Pipe Creek. Due to the low level of development around Chunky Pipe Creek and the limited area that falls within the city limits, no urban gems were identified. Two proposed SCM retrofits correspond with two of the keystone properties.

The Durham Trails and Greenways Master Plan has proposed the Chunky Pipe Creek Trail along the main stem of Chunky Pipe Creek west of Fletchers Chapel Road. A significant portion of the riparian buffers along the proposed greenway are already protected through public ownership or development restrictions placed during the site plan approval process; however, several unprotected parcels in the headwaters area around Southern High School were selected as keystone properties. Protecting these keystone properties would preserve the headwaters of Chunky Pipe Creek and the opportunity to create the proposed greenway trail. Several additional keystone properties were identified in the headwater streams that flow into Lake Unity.

1.2 Little Lick Creek

Based on the results for the baseline and priority criteria, 39 keystone properties and 13 urban gems were identified along Little Lick Creek. Sixteen proposed SCM retrofits correspond with keystone properties and five proposed SCM retrofits correspond with urban gems.

Similar to Chunky Pipe Creek, a significant portion of the riparian buffers along the main stem of Little Lick Creek and its larger tributaries are already protected through public ownership or development restrictions placed during the site plan approval process. The Durham Trails and Greenways Master Plan has proposed four trails along Little Lick Creek: the Oak Grove Trail, the Twin Lakes Trail, the Birchwood Trail, and the Little Lick Creek Trail.

Most of the riparian buffers along the proposed Oak Grove Trail through the Grove Park neighborhood are protected. However, several keystone properties on smaller tributaries upstream and downstream of Grove Park Lake have been selected to build upon these protected areas.

The intersection of the Twin Lakes Trail, the Birchwood Trail, and the Little Lick Creek Trail occurs on Little Lick Creek immediately west (upstream) of Mineral Springs Road. The Twin Lakes Trail continues northwest to Twin Lakes Park. Several keystone properties and urban gems along this tributary have been selected. Preserving these parcels would protect the forested buffers along Little Lick Creek and preserve the opportunity to create the proposed greenway trail. Two large keystone parcels that contain headwater tributaries are directly adjacent to Twin Lakes Park. Preserving these two parcels would also provide the opportunity to expand Twin Lakes Park.

The Little Lick Creek Trail travels north-south from the intersection of these three trails. Most of the forested riparian buffers along the northern portion of the proposed greenway trail that runs parallel to Mineral Springs Road are protected, however, several keystone properties were selected in the headwaters of this tributary along the route of the proposed greenway trail. Most of the riparian buffers on the southern portion of this proposed greenway trail are outside the city limits; however, several keystone properties and urban gems were selected in the Hidden Hollow and Lynn Hollow neighborhoods.

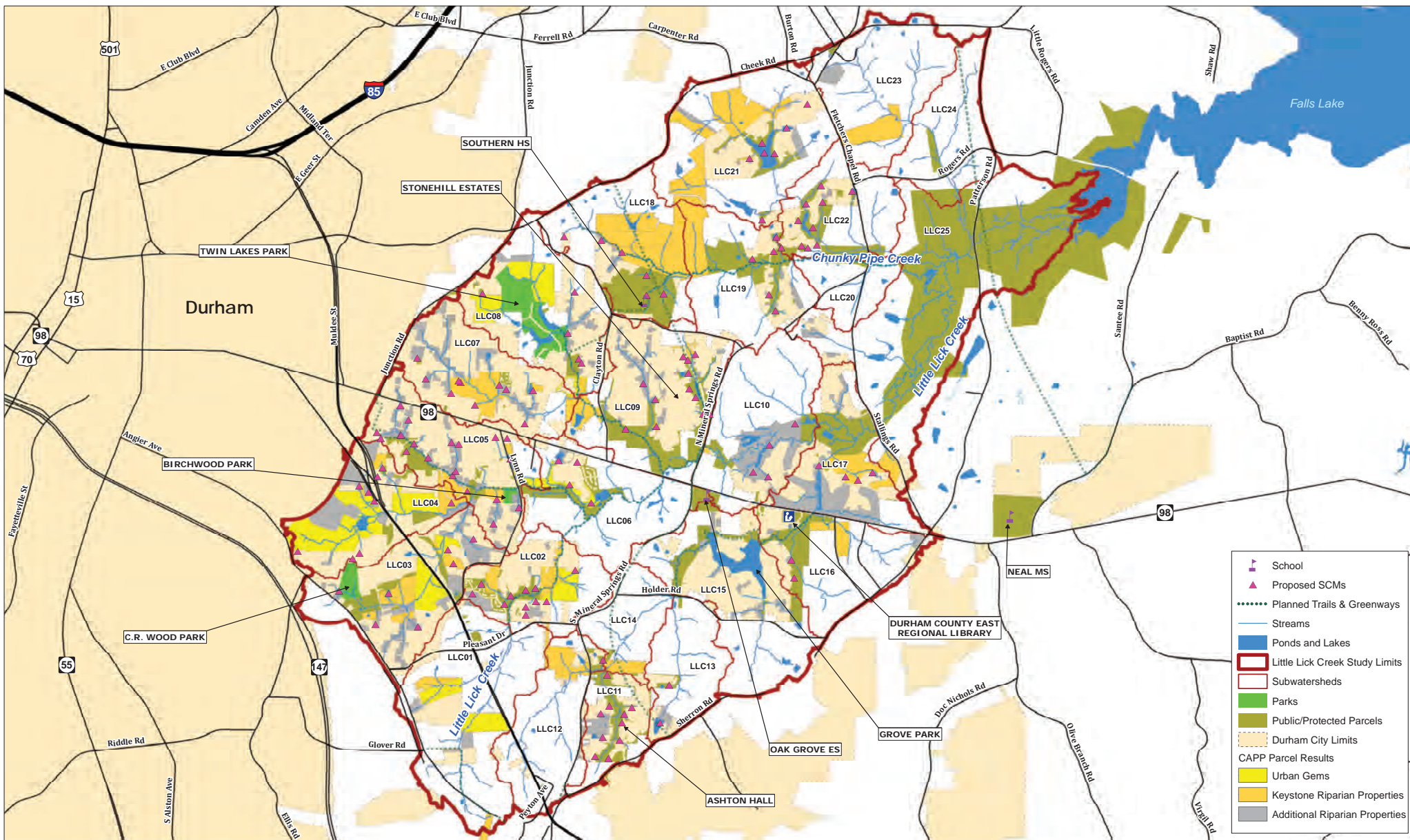
Similar to the other proposed trails, many of the forested buffers along the proposed route of the Birchwood Trail are already protected. Nevertheless, several keystone properties and urban gems were selected to fill in gaps along the proposed route near Lynn Road.

Several keystone properties and urban gems were also identified on the tributary that flows from C.R. Wood Park. Construction of the East End Connector will quickly accelerate development pressure in this area and transform this into a heavily urbanized area. The City should consider preserving these areas before development occurs or ensure that development does not encroach into the existing forested riparian buffers on these tributaries to Little Lick Creek.

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Little Lick Creek Watershed
Critical Area Protection Plan Map

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TABLES

Little Lick Creek Watershed

Table E-1. Keystone Property Parcel Scores

Table E-2. Urban Gem Parcel Scores

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Table D-1. Keystone Properties Summary for Little Lick Creek Watershed (2015)

Keystone Property Parcel Scores for LITTLE LICK CREEK WATERSHED																				
PID	Length of stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage	Vacancy Status	Parcel Area	Adjacent to Protected Park or Open Space	Unmanaged Land Cover	TOTAL SCORE
168054	4,339	4	0	1	0	1	1	1	0	0	0	1	0	1	2	2	2	2	1	19
167582	3,697	4	0	1	0	1	1	1	0	0	0	1	0	1	2	2	2	2	1	19
193759	2,485	4	0	0	1	1	0	1	0	0	0	1	0	0	2	2	2	2	1	17
158434	2,423	4	0	1	0	1	0	1	0	0	0	0	0	1	2	2	1	2	1	16
168125	2,254	4	0	1	0	1	1	0	0	0	0	1	0	1	2	2	2	0	1	16
166395	3,101	4	0	1	0	1	1	1	0	1	1	0	0	0	2	0	2	2	0	16
158922	1,998	4	0	1	0	1	1	1	0	0	0	0	0	1	2	2	2	0	1	16
162707	997	2	0	1	0	1	1	1	0	0	0	0	0	1	2	2	2	2	1	16
131736	510	4	0	1	0	1	0	0	0	0	0	0	1	1	2	0	2	2	1	15
215076	1,632	4	0	1	0	1	1	0	0	0	0	0	0	0	2	2	1	2	1	15
168124	1,988	4	0	1	0	1	0	0	0	0	0	1	0	1	2	2	2	0	1	15
193757	1,041	4	0	0	0	1	0	0	0	0	0	1	0	1	2	2	2	0	1	14
209965	3,520	4	0	1	0	1	1	0	0	0	0	0	0	0	2	2	2	0	1	14
132199	2,317	4	0	1	0	1	0	0	0	0	0	1	1	0	2	0	2	0	1	13
165465	531	2	0	1	0	1	1	1	0	0	0	0	0	1	2	0	1	2	1	13
169858	1,379	4	0	0	0	1	0	1	0	0	0	0	0	0	2	2	2	0	1	13
206811	832	2	0	1	0	1	0	0	0	0	0	1	0	1	2	2	0	2	1	13
166837	1,115	4	0	1	0	1	0	0	1	0	1	0	0	0	2	2	0	0	1	13
158778	1,424	4	0	1	0	1	0	1	0	0	0	0	0	1	2	2	0	0	1	13

Keystone Property Parcel Scores for LITTLE LICK CREEK WATERSHED

PID	Length of stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage	Vacancy Status	Parcel Area	Adjacent to Protected Park or Open Space	Unmanaged Land Cover	TOTAL SCORE
168141	2,457	4	0	0	0	1	0	1	0	0	0	0	0	0	2	2	2	0	1	13
132193	714	2	0	1	0	0	0	1	0	0	0	0	1	1	2	0	1	2	1	12
169845	1,620	4	0	1	0	1	0	0	0	0	0	0	0	0	2	2	1	0	1	12
169789	1,273	4	0	0	0	1	0	0	0	0	0	0	0	0	2	2	2	0	1	12
131149	1,039	4	0	1	0	1	1	0	0	0	0	0	1	0	2	0	1	0	1	12
131631	1,937	4	0	1	0	1	0	0	0	0	0	0	0	0	2	0	2	0	1	11
131168	554	2	0	1	0	1	0	0	0	0	0	0	1	0	2	2	1	0	1	11
158436	29	0	0	1	0	0	0	1	0	0	0	0	0	1	2	2	1	2	1	11
158876	771	2	0	1	0	1	0	0	0	0	0	1	1	0	2	2	0	0	1	11
168053	971	2	0	1	0	1	0	0	0	0	0	1	0	1	2	2	0	0	1	11
201471	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2	2	0	2	1	11
215078	515	2	0	1	0	1	0	0	0	0	0	0	0	0	2	2	2	0	1	11
158452	693	2	0	1	0	1	0	0	0	0	0	0	0	0	2	0	1	2	1	10
202580	264	0	0	1	0	1	0	1	0	0	0	0	1	1	2	2	0	0	1	10
132037	729	2	0	1	0	1	0	0	0	0	0	0	0	0	2	0	1	2	1	10
131148	340	0	0	1	0	1	1	0	0	0	0	0	1	0	2	0	1	2	1	10
165467	1,394	4	0	0	0	1	0	0	0	0	0	0	0	0	2	0	2	0	1	10
212200	44	0	0	1	0	1	0	1	0	0	0	0	0	0	2	2	0	2	1	10
131203	224	0	0	1	0	1	0	0	0	0	0	0	1	0	2	2	0	2	1	10
162379	116	0	0	1	0	0	1	1	0	0	0	1	0	1	2	0	0	2	1	10

Keystone Property Parcel Scores for LITTLE LICK CREEK WATERSHED

PID	Length of stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage	Vacancy Status	Parcel Area	Adjacent to Protected Park or Open Space	Unmanaged Land Cover	TOTAL SCORE
132031	164	0	0	1	0	1	0	0	0	0	0	0	0	0	2	2	0	2	1	9
132380	969	2	0	1	0	1	0	0	0	0	0	0	0	0	2	2	0	0	1	9
130557	523	2	0	1	0	1	0	0	0	0	0	0	0	0	2	2	0	0	1	9
130454	159	0	0	1	0	1	0	0	0	0	0	0	0	0	2	2	0	2	1	9
163501	234	0	0	0	0	1	0	0	0	0	0	0	1	1	2	2	1	0	1	9
193777	454	0	0	0	0	1	0	0	0	0	0	0	0	1	2	2	2	0	1	9
212456	617	2	0	1	0	1	0	0	0	0	0	0	0	0	2	2	0	0	1	9
214894	833	2	0	0	0	1	0	0	0	0	0	0	0	0	2	2	1	0	1	9
131037	155	0	0	1	0	0	0	0	0	0	0	0	1	0	2	2	0	2	1	9
132216	549	2	0	1	0	1	1	0	0	0	0	0	1	0	2	0	0	0	1	9

Table D-2. Urban Gem Properties Summary for Little Lick Creek Watershed (2015)

Urban Gem Parcel Scores for LITTLE LICK CREEK WATERSHED																				
PID	Length of stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage	Vacancy Status	Parcel Area	Adjacent to Protected Park or Open Space	Unmanaged Land Cover	TOTAL SCORE
158907	2,098	4	0	1	0	0	0	1	0	0	0	1	1	1	2	2	2	2	1	18
130556	6,969	4	0	1	0	1	1	0	0	0	0	0	1	0	2	2	2	2	1	17
158435	2,293	4	0	1	0	1	0	1	0	0	0	0	0	1	2	2	2	2	1	17
168330	2,551	4	0	1	0	1	1	0	0	0	0	0	1	0	2	2	2	2	1	17
209341	952	2	0	1	0	1	1	1	0	0	0	0	1	1	2	2	1	2	1	16
159245	1,428	4	0	1	0	1	0	0	0	0	0	0	1	0	2	2	2	2	1	16
131226	1,336	4	0	1	0	1	0	0	0	0	0	0	0	0	2	2	2	2	1	15
158335	3,097	4	0	1	0	1	0	0	0	0	0	0	0	0	2	2	2	2	1	15
132036	1,526	4	0	1	0	1	0	0	0	0	0	0	0	0	2	2	1	2	1	14
131249	507	4	0	1	0	0	0	0	0	0	0	0	0	0	2	2	2	2	1	14
158256	1,790	4	0	0	0	1	0	0	0	0	0	0	0	0	2	2	2	0	1	12
158189	938	2	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	0	1	9
158257	566	2	0	0	0	1	0	0	0	0	0	0	0	0	2	2	1	0	1	9

Appendix F

Critical Area Protection Plan for the Eno River Watershed

Completed in 2017

1.0 Results

The Eno River watershed encompasses approximately 96,620 acres (~150 square miles) of which approximately 18,550 acres (~29 square miles) lie within Durham County. Approximately 10,400 acres (~16 square miles) of the watershed is located within the Durham City limits. Based on the initial assessment of qualifying parcels within the City limits, and the scores assigned for the baseline and priority criteria, 45 keystone properties and 3 urban gems were identified in the Eno River watershed. Eight of the keystone properties were identified outside the City's jurisdictional limits (PID #s 160404, 177713, 181455, 186793, 176944, 172240, 178019, and 169156) within Durham County's jurisdiction. These properties were either adjacent to or near properties within the City limits.

In relation to other watersheds within the City, the Eno River watershed has several unique features that influenced the selection of keystone properties and urban gems:

- Within the Durham County jurisdictional limits, the entire Eno River watershed is located within a City-County Watershed Protection Overlay zone, and approximately:
 - 4% is within the Eno River Critical Area;
 - 72% is within the Eno River Protected Area;
 - 3% is within the Falls/Jordan Critical Area, and
 - 21% is within Falls/Jordan Protected Area.

Therefore, development of land within these Watershed Protection Overlay zones must adhere to the riparian buffer protection rules specified in Section 8.5.4.B.1 of the UDO.

- There is limited industrial and commercial development within the watershed; the majority of the land within the watershed is forested and interspersed with low to moderate density residential housing developments.
- A significant portion of the riparian buffers located along the main stem of the Eno River and its tributaries are protected within State/County/City parks including the Eno River State Park, West Point on the Eno City Park, and Old Farm Road, River Forest and Valley Springs City Parks.

As shown in Table 3 in Section 2.2 of this document, the baseline score for a parcel to qualify as a Keystone Parcel in the Eno River Watershed is 13. This value is the highest Keystone Parcel baseline in comparison to other watersheds evaluated in the City and was a result of numerous parcels in the Eno River Watershed scoring high in this analysis. Using a lower baseline for the Keystone Parcel analysis resulted in a large number of parcels being identified for preservation that had existing development, such as impervious surface or a stormwater control measure. In an effort to reconcile this issue, the Keystone Parcel baseline was adjusted and parcels with Home Owner's Association-protected Land Use types such as 'Community-Apartment Garden' or similar were excluded from the analysis. Despite these adjustments, the analysis still includes several parcels with some form of existing development or impervious area.

KEYSTONE properties are the highest-priority parcels identified for protection in each watershed that can expand high-quality riparian areas that are already protected, such as existing parks, or that could serve as parcels around which larger protected areas might be built.

URBAN GEMS are properties that contain high-quality riparian areas in heavily urbanized portions of each watershed which are isolated or lack connectivity to other protected open spaces. Although Urban Gems would not qualify as a keystone property, they still hold specific individual characteristics that are deemed particularly worthy of protection.

The Eno River watershed is different in its development patterns than other watersheds in the City. This is mainly due to restrictions from water supply protected areas and overlays. Preservation in the Eno River watershed should not rely solely on acquisition of undeveloped parcels. Preservation in the Eno River Watershed may need to focus on establishment of conservation easements or restoration projects on developed private property. This approach is likely to require cooperation through incentives or partnerships between the City and private entities or other watershed protection groups.

The watershed-scale map provided in this appendix presents all the qualifying parcels, the keystone properties, the urban gems, and schools, parks, and other protected or public lands. Tables F-1 and F-2 provide the individual scores for each keystone property and urban gem for the baseline and priority criteria. A detailed summary of critical area protection and preservation opportunities are discussed below for the riparian buffers within the Eno River watershed as well as its two major subwatersheds: Warren Creek and Crooked Run Creek.

NOTE: The current availability of identified parcels should be evaluated when using this report.

1.1 Eno River Watershed

Based on the results for the baseline and priority criteria, 45 keystone properties and three urban gems were identified across the entire Eno River watershed study limits. Five of the proposed SCM projects are located within identified keystone properties (ENO 0129, ENO 0135, ENO 0157, ENO 0165, and ENO 0166).

A significant portion of the riparian buffers along the main stem of the Eno River and tributaries are already protected through public ownership or development restrictions placed during the site plan approval process through Durham's UDO and state riparian buffer rules. The UDO and state rules are subject to change. Protection through ownership or deed restriction such as a conservation easement is more reliable.

The three urban gem properties identified in the Eno River Watershed provide opportunities for headwater stream protection immediately upstream of identified keystone properties. By incorporating these urban gems into the conservation plans, the City has an opportunity to preserve entire stream reaches draining directly to the Eno River.

The largest and only named subwatersheds in the Eno River study limits are Warren Creek and Crooked Creek. For discussion and analysis on a subwatershed scale, each of these watersheds is discussed below.

1.1.1 Warren Creek Subwatershed

Based on the results for the baseline and priority criteria, eight of the 45 keystone properties were identified in the Warren Creek subwatershed. Due to the low level of commercial and industrial development in the watershed, and the prevalence of low to moderate density residential housing, no urban gems were identified.

Portions of the Croasdaile Farm neighborhood are located within the Warren Creek subwatershed, which has large tracts of undeveloped forested lands interspersed between residential areas. Crystal Lake and Croasdaile Farm presents a large complex of keystone properties that comprise approximately one third of the Warren Creek subwatershed.

The two highest scoring keystone properties located in the Warren Creek subwatershed (PID 177587 and 177597) are located along the right bank of Warren Creek, contain multiple streams draining to Warren Creek, and are contiguous parcels less than 500' from the West Point on the Eno City Park.

1.1.2 Crooked Run Creek Subwatershed

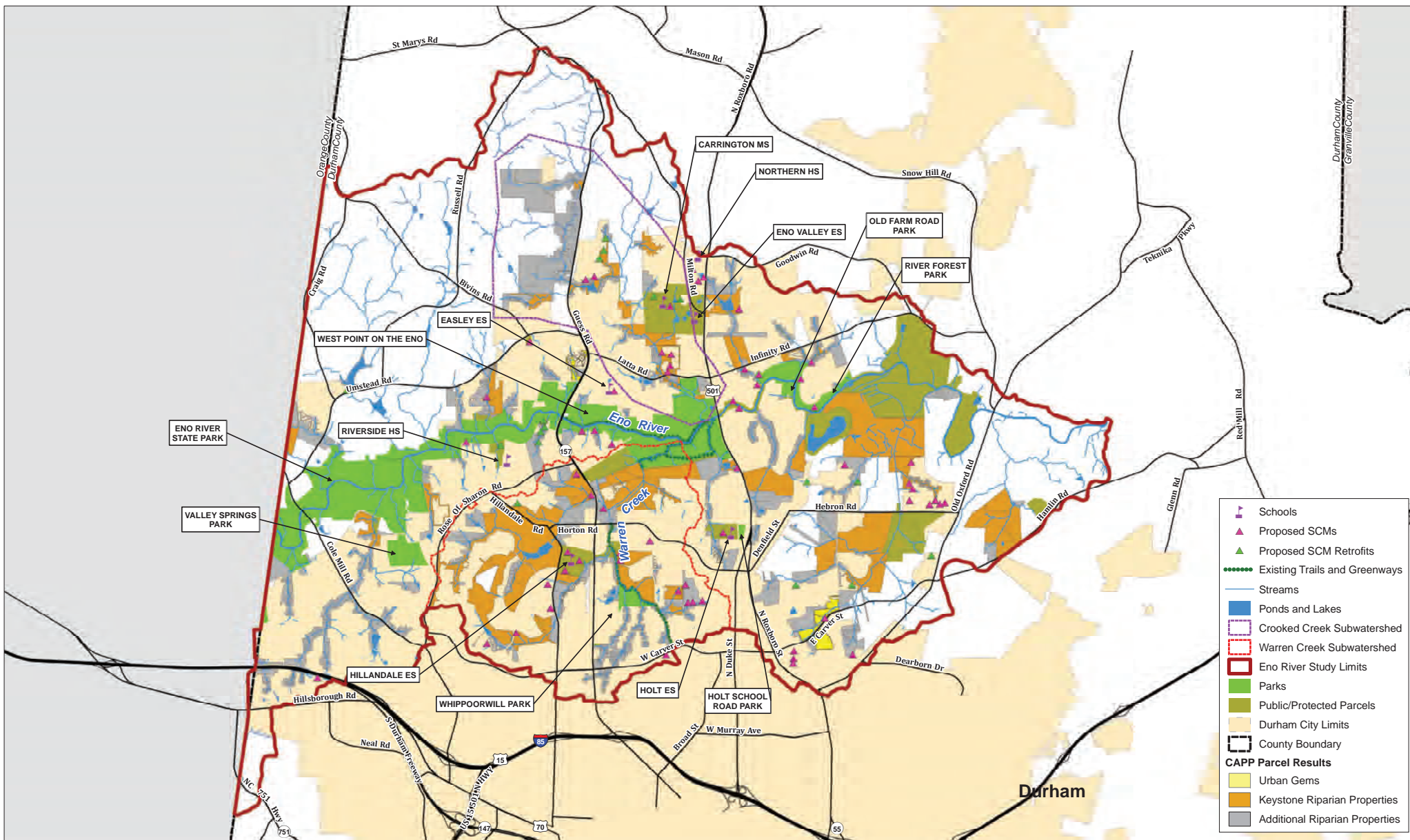
Based on the results for the baseline and priority criteria, 10 of the 45 keystone properties were identified in the Crooked Run Creek subwatershed. The majority of the keystone properties throughout the Crooked Run Creek subwatershed are currently vacant land uses or adjacent to homeowner's associations or institutional developments. Due to the low level of commercial and industrial development in the watershed, and the prevalence of very low to moderate density residential housing, no urban gems were identified.

Two large keystone properties (PID 182907 and 183002) within the Crooked Run Creek subwatershed are adjacent to George L. Carrington Middle School and provide a unique opportunity for conservation adjacent to an existing public school. One SCM project (Eno 0176) and one SCM retrofit opportunity (Site 00047) are located on the school's property.

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Eno River Watershed
Critical Area Protection Plan Map

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TABLES

Eno River Watershed

Table F-1. Keystone Property Parcel Scores

Table F-2. Urban Gem Parcel Scores

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Table F-1. Keystone Properties Summary for Eno River Watershed (2017)

Keystone Property Parcel Scores for ENO RIVER WATERSHED																				
PID	Length of stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage	Vacancy Status	Parcel Area	Adjacent to Protected Park or Open Space	Unmanaged Land Cover	TOTAL SCORE
183002	1715	4	1	1	1	1	1	1	1	0	0	1	0	0	2	2	2	0	1	19
172630	1610	4	1	1	1	1	0	0	1	0	1	0	1	0	2	2	2	0	1	18
177715	2583	4	1	1	1	0	1	1	1	0	1	0	0	0	2	2	2	0	1	18
178019	927	2	1	1	1	0	1	1	1	1	1	0	1	0	2	0	2	2	1	18
172642	1058	4	1	1	1	1	0	0	1	0	1	0	1	0	2	0	1	2	1	17
176944	213	0	1	0	1	1	1	1	1	1	1	0	1	1	2	2	2	0	1	17
177587	1369	4	1	1	0	1	1	1	1	0	1	0	1	0	2	0	2	0	1	17
177597	1047	4	1	1	0	1	1	1	1	0	1	0	1	0	2	0	2	0	1	17
160404	0	0	1	1	1	1	1	1	1	1	1	0	0	0	2	2	2	0	1	16
172240	776	2	1	1	0	0	1	1	1	1	1	0	0	0	2	2	2	0	1	16
177595	435	0	1	1	0	0	1	1	1	0	1	0	1	1	2	2	1	2	1	16
180607	1215	4	1	1	1	0	0	1	1	0	1	0	1	0	2	0	2	0	1	16
182907	1592	4	1	1	1	1	1	1	1	0	0	0	0	0	2	0	2	0	1	16
169156	0	0	1	1	1	1	1	1	1	1	0	0	0	0	2	2	2	0	1	15
172640	549	2	1	1	1	1	0	0	1	0	1	0	0	0	2	2	2	0	1	15
173138	1257	4	1	1	0	1	0	1	1	0	0	1	0	0	2	0	2	0	1	15
177601	417	0	1	1	1	1	0	0	1	0	1	0	1	1	2	0	2	2	1	15
180764	157	0	1	1	1	0	1	1	1	0	1	0	1	0	2	2	0	2	1	15
182245	1343	4	1	1	1	1	0	1	1	0	1	0	0	0	2	0	1	0	1	15
182250	568	2	1	1	1	0	0	1	1	0	1	0	0	0	2	2	2	0	1	15
183534	1884	4	1	1	1	1	0	0	1	0	0	1	0	0	2	0	2	0	1	15
220023	2134	4	1	1	1	1	0	0	1	0	1	0	0	0	2	0	2	0	1	15

Keystone Property Parcel Scores for ENO RIVER WATERSHED																				
PID	Length of stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage	Vacancy Status	Parcel Area	Adjacent to Protected Park or Open Space	Unmanaged Land Cover	TOTAL SCORE
177448	211	0	1	1	1	1	0	0	1	0	1	0	1	0	2	0	2	2	1	14
177713	944	2	1	1	0	1	1	0	1	0	0	0	0	0	2	2	2	0	1	14
180609	494	0	1	1	1	0	0	1	1	0	1	0	1	0	2	2	2	0	1	14
180777	99	0	1	1	0	0	1	1	1	0	1	0	1	0	2	2	0	2	1	14
180795	100	0	1	1	0	0	1	1	1	0	1	0	1	0	2	2	0	2	1	14
181295	12	0	1	0	1	0	0	1	1	1	1	0	0	1	2	2	0	2	1	14
181455	17	0	1	1	1	0	1	0	1	1	1	0	0	0	2	2	2	0	1	14
182971	199	0	1	1	1	1	1	1	1	0	1	0	1	0	2	2	0	0	1	14
220024	1378	4	1	1	1	0	0	1	1	0	0	0	0	0	2	0	2	0	1	14
126001	600	2	1	1	0	1	0	0	1	0	0	0	1	0	2	2	1	0	1	13
126886	41	0	1	1	1	0	0	1	1	1	0	0	1	1	2	0	0	2	1	13
172633	533	2	1	1	1	1	0	0	1	0	0	0	1	0	2	0	2	0	1	13
177608	67	0	1	1	0	0	1	1	1	0	1	0	1	1	2	0	2	0	1	13
177614	683	2	1	1	0	1	0	0	1	0	0	0	0	0	2	2	2	0	1	13
178798	0	0	1	1	0	0	0	1	1	0	1	0	1	0	2	2	0	2	1	13
180763	0	0	1	1	0	0	0	1	1	0	1	0	1	0	2	2	0	2	1	13
180772	0	0	1	1	0	0	0	1	1	0	1	0	1	0	2	2	0	2	1	13
181032	118	0	1	1	1	1	0	0	1	0	1	1	1	0	2	0	0	2	1	13
181456	825	2	1	1	1	0	1	0	1	0	1	0	0	0	2	0	2	0	1	13
182817	452	0	1	1	1	0	1	1	1	0	0	0	0	0	2	2	2	0	1	13
182972	68	0	1	1	1	0	1	1	1	0	1	0	1	0	2	2	0	0	1	13
183532	787	2	1	1	1	1	0	0	1	0	0	0	0	0	2	2	1	0	1	13
183533	625	2	1	1	1	1	0	0	1	0	0	1	0	0	2	0	2	0	1	13

Table F-2. Urban Gem Properties Summary for Eno River Watershed (2017)

Urban Gem Parcel Scores for ENO RIVER WATERSHED																				
PID	Length of stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage	Vacancy Status	Parcel Area	Adjacent to Protected Park or Open Space	Unmanaged Land Cover	TOTAL SCORE
172102	402	0	1	1	1	1	0	1	1	0	0	0	0	0	2	0	1	0	0	9
182413	317	0	1	1	1	1	0	0	1	0	1	0	1	0	2	0	0	0	0	9
172266	245	0	1	1	1	0	0	1	1	0	0	0	0	0	2	0	1	0	0	8

Appendix G

Critical Area Protection Plan for the New Hope Creek Watershed

Completed in 2021

1.0 Results

The New Hope Creek watershed encompasses approximately 39,480 acres (~62 square miles) of which approximately 17,040 acres (~27 square miles) lie within Durham County and 12,520 acres (~20 square miles) lie within the Durham City limits. Based on the initial assessment of qualifying parcels within the City limits and the scores assigned for the baseline and priority criteria, 93 keystone properties and 14 urban gems were identified in the New Hope Creek Watershed. Twenty-three of the keystone properties were identified outside the City's jurisdictional limits, but within Durham County's jurisdiction. These properties were immediately adjacent to the City limits.

For this CAPP, the New Hope Creek watershed was split into three subwatersheds: Mud Creek, New Hope Creek, and Sandy Creek. The Mud Creek subwatershed is approximately 3,703 acres (~5.8 square miles), of which 3,657 acres (~5.7 square miles) is located within Durham County and 1,626 acres (~2.5 square miles) is located within the Durham City Limits. The New Hope Creek subwatershed is approximately 31,384 acres (~49.4 square miles), of which 8,990 acres (~14.1 square miles) is located within Durham County and 6,499 acres (~10.2 square miles) is located within the Durham City Limits. The Sandy Creek subwatershed is approximately 4,393 acres (~6.9 square miles) and is located entirely within Durham County and the Durham City Limits.

A unique feature within the New Hope Creek Watershed is the large footprint of land that is held by the Duke University system and its affiliates. The influence of the Duke University institution in the watershed is reflected in the land use and development patterns. Trinity College, which later became Duke University, relocated to Durham in 1892, two decades after Durham was officially incorporated as a municipality. In the 1930's, Duke University West Campus and Duke Forest Teaching and Research Laboratory were established in this area of Durham.

The West Campus of Duke University comprises approximately 1,391 acres (~2.2 square miles) of the Sandy Creek, 18.1 acres of the New Hope Creek, and 7.2 acres of the Mud Creek subwatersheds. Duke Forest encompasses approximately 7,060 acres (~11 square miles) of mostly forested land and is located in three counties (Alamance, Orange, and Durham). Within the study area, Duke Forest comprises approximately 1,177 acres (~1.8 square miles) of Mud Creek, 108 acres of Sandy Creek, and 51 acres of New Hope Creek subwatersheds.

Parcels belonging to the Duke University system were included as part of the initial CAPP analysis which identifies all private land along stream corridors. Through coordination with Duke University, parcels located within the West Campus of Duke were classified as *Institutional – Private* and parcels located within Duke Forest were classified as *Institutional – Private Research Forest*. These parcels were not considered eligible to be selected as keystone parcels or urban gems because these areas are operated by a separate institutional authority under an existing comprehensive management plan.

The southern portion of the New Hope Creek subwatershed lies within the Falls/Jordan Protected Area, which provides some protection to riparian areas under Section 8.5.4.B.1 of the Unified Development

KEYSTONE properties are the highest-priority parcels identified for protection in each watershed that can expand high-quality riparian areas that are already protected, such as existing parks, or that could serve as parcels around which larger protected areas might be built.

URBAN GEMS are properties that contain high-quality riparian areas in heavily urbanized portions of each watershed which are isolated or lack connectivity to other protected open spaces. Although Urban Gems would not qualify as a keystone property, they still hold specific individual characteristics that are deemed particularly worthy of protection.

Ordinance. The Mud Creek and Sandy Creek subwatersheds are not within any City-County Watershed Protection Overlay zone.

Within the study area, a large portion of the riparian buffers along the main stem of New Hope Creek and its tributaries are already protected through public ownership by the United States Army Corps of Engineers.

Portions of the New Hope Creek Watershed were included in the ReGIn analysis, a City of Durham-specific prioritization criteria applied to a census block scale and at a parcel scale in order to identify neighborhood type areas (clusters) to install green infrastructure practices such as rain gardens and downspout disconnections in an equitable way throughout the City. The ReGIn prioritization includes an Environmental Equity category that considers environmental justice across the City. The area of the city that has the highest score under the ReGIn analysis is considered a Tier 1, or high need area. A GIS overlay of Tier 1 projects was applied to identify parcels located within the Tier 1 boundary. The analysis showed that 4 keystone parcels were in the Tier 1 areas. Three of these parcels (PIDs: 136999, 137007, and 139488) are located in the New Hope Creek subwatershed and one parcel (PID: 139329) is located in the Sandy Creek subwatershed. There were no urban gems found within a Tier 1 area.

As shown in Table 3 in Section 2.2 of this document, the baseline score for a parcel to qualify as a keystone parcel in the New Hope Creek Watershed is 11. In comparison to the other watersheds analyzed in previous CAPPs, this value is the second highest baseline score and matches the score used for the Northeast Creek (90 keystone parcels) and Crooked Creek (12 keystone parcels) watersheds. This relatively high value was chosen because of the large number of privately-owned parcels, minimal area within a Watershed Protection Overlay zone, and the inclusion of data from the Eno-New Hope Landscape Conservation group which identified areas for habitat connectivity.

The watershed-scale map provided in this appendix presents all the qualifying parcels, the keystone properties, and the urban gems as well as several factors that were used in parcel scoring such as schools, parks, and other protected or public lands. Tables G-1 and G-2 provide the individual scores for each keystone property and urban gem for the baseline and priority criteria. A detailed summary of critical area protection and preservation opportunities are discussed below for the riparian buffers within each of the three subwatersheds of the New Hope Creek watershed.

NOTE: The current availability of identified parcels and status of any proposed projects should be evaluated when using this report because the data used in the parcel analysis is from May 2020 and parcels may have since been developed, acquired for development, or acquired by the City. Users of this document should verify that the parcel data and watershed maps are current and reflect existing conditions.

1.1 Mud Creek Subwatershed

The Mud Creek subwatershed is the least developed of the three subwatersheds. The northern portion contains mostly low to high density residential areas. Duke Forest and agricultural fields comprise the central portion, and residential development is most prevalent in the southern portion. There were two schools and two parks identified within the Mud Creek subwatershed.

Based on the results for the baseline and priority criteria, 20 of the 93 keystone properties and 1 of the 14 urban gems were identified in the Mud Creek subwatershed.

There is a cluster of eight parcels (PIDs: 138433, 138434, 138435, 138436, 138641, 138642, 138681, 138695) that have riparian buffers along the main stem of Mud Creek and, if protected, could link the Duke Forest parcels in the north with publicly protected open space in the south that straddle

New Hope Creek. All eight parcels are mostly forested and overlap areas with moderate to high Corridor scores.

The only urban gem identified in the Mud Creek subwatershed was PID 138680. This property is adjacent to a keystone property (PID: 138681) and both properties have the same owner. This urban gem would also provide a connection to other keystone properties that were identified directly across Pickett Road to the north.

1.2 Sandy Creek Subwatershed

The Sandy Creek subwatershed has the most development of the three subwatersheds. The northern portion is comprised of the Duke University West Campus, medium to high density residential development, and commercial development. The southern portion is characterized by commercial, residential, and some institutional development. There are three large areas of open space: Sandy Creek Park, Cornwallis Road Park, and a portion of Duke Forest. There are seven schools within the Sandy Creek subwatershed.

Based on the results for the baseline and priority site criteria, 22 of the 93 keystone properties and 1 of the 14 urban gems were identified in the Sandy Creek subwatershed.

There are three parcels (PIDs: 138273, 138784, 138895) located along the main stem of Sandy Creek that, if protected, could help to provide a habitat connection between Duke Forest and the Sandy Creek Park. This cluster also borders four schools (Cresset Christian Academy, Durham Academy Lower School, Durham Academy Upper School, and the Hill Center) and overlays areas that were rated moderate to high as a Habitat Corridor. One of these parcels is currently classified as Vacant in the latest parcel database, meaning that there are no structures located within the parcel boundary.

South of Sandy Creek Park, there is a cluster of three parcels (PIDs: 139444, 139446, 140093) that would help connect Sandy Creek Park to publicly protected open space that straddles the New Hope Creek. These parcels did not score as high as other parcels due to the lack of forest cover and nearby presence of commercial and residential development.

The only urban gem identified in the Sandy Creek subwatershed was PID 108227. This property is directly north of a keystone property (PID: 108043) and was chosen because it is vacant, scored relatively highly (score: 8), and is near Maplewood Cemetery, which contains a large reach of stream.

1.3 New Hope Creek Subwatershed

Development within the New Hope Creek subwatershed is a mixture between commercial, low to high density residential, and protected open space. Commercial and high-density residential development is prevalent at the northern edge, the southwestern border with the Little Creek watershed, and the southeastern portion near Interstate 40. The main stem of New Hope Creek, after its confluence with Mud and Sandy Creeks, is mostly protected open space. The remainder of the subwatershed is characterized by low to medium residential development. There are five schools within the New Hope Creek subwatershed.

Most of the protected space lies along the main stem of New Hope Creek. In the northern part of the subwatershed, this land is owned mostly by Durham County and in the southern portion, the majority owner is the United States Army Corps of Engineers and is part of the Jordan Lake Gamelands. These areas were established to provide mitigation for environmental impacts due to the construction of Jordan Lake and help protect water quality. Two large parks are located within the New Hope Creek subwatershed: Leigh Farm Park, located east of Interstate 40; and Old Chapel Hill Road Park, located near Sherwood Githens Middle School.

Based on the results for the baseline and priority site criteria, 51 of the 93 keystone properties and 12 of the 14 urban gems were identified in the New Hope Creek subwatershed.

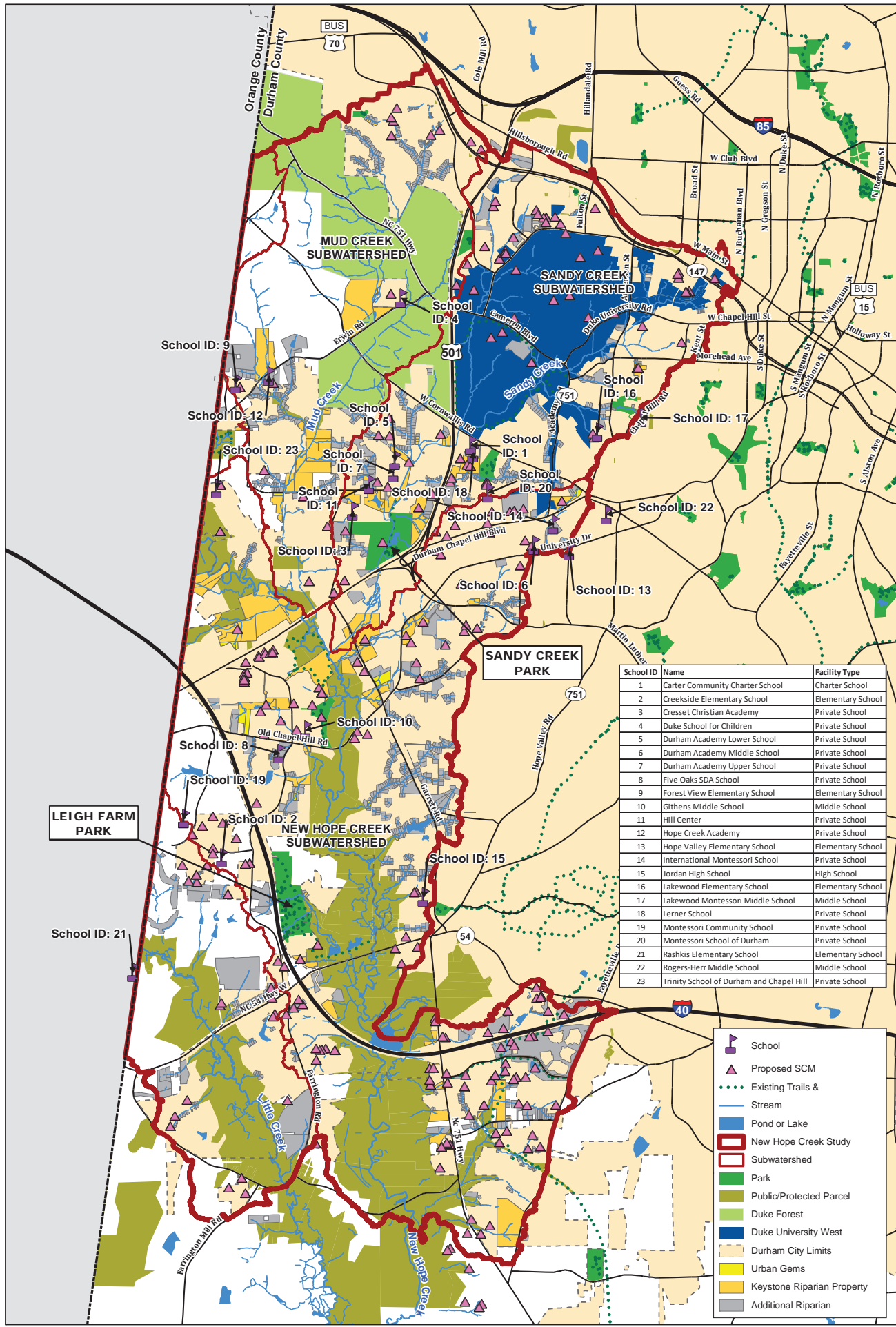
Most of the high scoring parcels in this subwatershed are located to the north, near the confluence of Mud Creek and Sandy Creek into New Hope Creek. These parcels are adjacent to protected open space and the protection of the riparian buffers of these parcels would help link to other protected open spaces in the Mud and Sandy Creek subwatersheds. Several existing trails are in the area, which helped to increase the scoring for these parcels. Proposed trails and greenways were not included in the New Hope Creek CAPP because these data layers were being updated by the City during this analysis.

Most of the urban gem properties are vacant parcels (based on the Land Use attribute of the parcel data) that scored just under the minimum threshold score of 11 and were adjacent to keystone properties or protected open space. One urban gem, PID 116552, is adjacent to the Forest History Society and might provide an opportunity for collaboration with the City.

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New Hope Creek Watershed
Critical Area Protection Plan Map

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School ID	Name	Facility Type
1	Carter Community Charter School	Charter School
2	Creekside Elementary School	Elementary School
3	Cresset Christian Academy	Private School
4	Duke School for Children	Private School
5	Durham Academy Lower School	Private School
6	Durham Academy Middle School	Private School
7	Durham Academy Upper School	Private School
8	Five Oaks SDA School	Private School
9	Forest View Elementary School	Elementary School
10	Githens Middle School	Middle School
11	Hill Center	Private School
12	Hope Creek Academy	Private School
13	Hope Valley Elementary School	Elementary School
14	International Montessori School	Private School
15	Jordan High School	High School
16	Lakewood Elementary School	Elementary School
17	Lakewood Montessori Middle School	Middle School
18	Lerner School	Private School
19	Montessori Community School	Private School
20	Montessori School of Durham	Private School
21	Rashkis Elementary School	Elementary School
22	Rogers-Herr Middle School	Middle School
23	Trinity School of Durham and Chapel Hill	Private School

TABLES

New Hope Creek Watershed

Table G-1. Keystone Property Parcel Scores

Table G-2. Urban Gem Parcel Scores

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Table G-1. Keystone Properties Summary for New Hope Creek Watershed (2021)

Keystone Property Parcel Scores for NEW HOPE CREEK WATERSHED																					
PID	Length of Stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage	Vacancy Status	Parcel Area	Adjacent to Protected Park or Open Space	Unmanaged Land Cover	Habitat Patch or Corridor	TOTAL SCORE
138784	2511	4	1	1	1	1	1	1	0	0	0	1	1	1	2	2	2	2	1	2	24
206067	2968	4	1	1	0	1	1	1	1	1	1	0	0	0	2	2	2	2	1	2	23
139988	1282	4	1	1	0	1	1	1	1	1	1	0	1	0	2	0	1	2	1	2	21
140087	5014	4	1	1	0	1	1	1	0	1	1	0	0	1	2	0	2	2	1	2	21
140125	1310	4	1	1	0	1	1	1	1	1	1	1	1	1	0	0	2	2	0	2	21
140136	1969	4	1	0	1	1	1	1	0	0	1	0	0	0	2	2	2	2	1	2	21
206066	4719	4	1	1	0	1	1	1	1	1	1	0	0	0	0	2	2	2	0	2	20
140130	1083	4	1	1	0	1	1	1	1	0	1	0	0	0	0	2	2	2	0	2	19
140132	1190	4	1	1	0	1	1	1	1	0	1	0	0	0	0	2	2	2	0	2	19
137065	1708	4	1	1	0	1	0	0	1	0	0	1	1	0	2	2	1	2	1	0	18
140083	0	0	1	1	0	1	1	1	1	1	1	0	1	0	2	2	1	2	0	2	18
137743	4111	4	1	1	0	1	1	0	1	0	0	1	0	0	2	0	2	0	1	2	17
138273	1302	4	1	1	1	1	1	1	0	0	0	1	0	0	2	0	1	0	1	2	17
138433	1914	4	1	1	0	1	1	1	1	0	0	0	0	0	2	0	2	0	1	2	17
140138	526	2	1	0	0	1	1	1	0	0	1	0	0	0	2	2	1	2	1	2	17
140149	1246	4	1	0	1	1	1	1	0	0	1	0	0	0	0	2	1	2	0	2	17
143564	514	2	0	1	0	1	1	0	1	0	1	0	0	0	2	2	1	2	1	2	17
179367	2078	4	0	1	1	1	1	1	0	0	0	0	0	1	0	0	2	2	1	2	17
137683	2990	4	1	1	0	1	1	1	1	0	1	1	0	0	0	0	2	0	0	2	16
138436	3280	4	1	0	0	1	1	1	1	0	0	0	0	0	2	0	2	0	1	2	16
141388	1085	4	0	0	0	1	1	1	1	1	1	1	0	0	0	0	1	2	0	2	16
141491	0	0	0	1	0	1	1	1	0	0	1	1	1	0	2	2	0	2	1	2	16

Keystone Property Parcel Scores for NEW HOPE CREEK WATERSHED																					
PID	Length of Stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage	Vacancy Status	Parcel Area	Adjacent to Protected Park or Open Space	Unmanaged Land Cover	Habitat Patch or Corridor	TOTAL SCORE
141494	0	0	0	1	0	1	1	1	0	0	1	1	1	0	2	2	0	2	1	2	16
138641	1917	4	1	1	0	1	1	1	0	0	0	0	0	0	2	0	1	0	1	2	15
138642	915	2	1	1	0	1	1	1	0	0	0	1	0	0	2	0	2	0	1	2	15
139444	2947	4	1	1	0	1	1	1	1	0	1	0	0	0	0	0	2	0	0	2	15
139447	1354	4	1	1	0	1	1	1	0	0	1	0	0	0	0	0	2	0	1	2	15
150730	1304	4	0	1	0	1	1	0	0	0	1	0	0	0	2	2	2	0	1	0	15
213724	662	2	1	1	1	1	0	0	1	0	0	1	1	0	2	2	1	0	1	0	15
137105	662	2	1	1	0	1	1	1	1	0	0	1	0	0	2	0	0	0	1	2	14
137175	645	2	1	1	0	1	0	0	1	0	0	1	1	0	2	0	2	2	0	0	14
139458	1227	4	1	1	0	1	1	0	0	0	1	0	0	0	2	2	1	0	0	0	14
141521	291	0	0	1	0	1	1	1	0	0	1	1	1	0	2	0	0	2	1	2	14
196946	930	2	1	1	0	1	1	0	1	0	1	1	1	0	0	2	2	0	0	0	14
121306	280	0	1	1	1	1	0	0	1	0	0	1	1	1	2	0	1	2	0	0	13
138041	0	0	1	0	0	1	1	1	0	0	0	0	0	0	2	2	0	2	1	2	13
138681	859	2	1	1	0	1	1	1	0	0	0	0	0	0	2	0	1	0	1	2	13
138895	172	0	1	1	0	1	1	1	0	0	0	1	1	1	2	0	0	0	1	2	13
139446	1157	4	1	1	0	1	1	1	0	0	1	0	0	0	0	0	1	0	0	2	13
139975	0	0	0	1	0	0	1	1	0	1	1	0	0	0	2	2	0	2	0	2	13
143335	57	0	0	1	0	1	1	1	0	0	0	0	0	0	2	2	0	2	1	2	13
137684	917	2	1	1	0	1	1	1	0	0	1	1	0	0	0	0	1	0	0	2	12
138334	151	0	1	1	0	1	0	1	0	0	0	1	0	0	2	2	0	0	1	2	12
138335	135	0	1	1	0	1	0	1	0	0	0	1	0	0	2	2	0	0	1	2	12
138336	106	0	1	1	0	1	0	1	0	0	0	1	0	0	2	2	0	0	1	2	12

Keystone Property Parcel Scores for NEW HOPE CREEK WATERSHED																					
PID	Length of Stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage	Vacancy Status	Parcel Area	Adjacent to Protected Park or Open Space	Unmanaged Land Cover	Habitat Patch or Corridor	TOTAL SCORE
138434	496	0	1	0	0	1	1	1	1	0	0	0	0	0	0	0	2	2	1	2	12
138794	455	0	1	1	0	1	1	0	0	0	0	1	1	0	2	0	1	0	1	2	12
139009	0	0	1	1	0	1	1	1	0	0	1	0	0	0	2	0	0	2	0	2	12
139949	359	0	0	0	0	1	1	0	0	0	1	0	0	0	2	2	0	2	1	2	12
140131	484	0	1	1	0	1	1	1	1	0	1	0	0	0	0	2	1	0	0	2	12
141387	589	2	0	0	0	1	1	1	1	0	1	1	0	0	2	0	0	0	0	2	12
141581	283	0	0	1	0	1	1	0	0	0	1	0	1	0	0	2	0	2	1	2	12
143357	269	0	0	1	0	1	1	0	0	0	1	0	0	0	2	0	1	2	1	2	12
143610	260	0	0	1	0	1	0	0	0	0	1	0	0	0	2	2	0	2	1	2	12
150731	1146	4	0	1	0	1	1	0	0	0	1	0	0	0	2	0	2	0	0	0	12
174869	92	0	1	1	0	1	0	0	0	0	0	0	1	1	2	2	0	2	1	0	12
196947	119	0	1	1	0	1	1	0	0	0	1	1	1	0	2	0	2	0	1	0	12
206542	47	0	0	0	0	1	1	0	0	0	1	0	1	1	2	0	0	2	1	2	12
108043	330	0	1	1	0	1	0	0	1	0	0	0	1	0	2	2	1	0	1	0	11
135935	195	0	0	1	0	1	0	0	0	0	1	1	0	0	2	2	0	2	1	0	11
136062	92	0	0	0	0	1	1	0	1	0	1	0	0	0	2	0	0	2	1	2	11
136999	541	2	1	1	0	1	0	0	1	0	0	0	0	0	2	2	0	0	1	0	11
137007	702	2	1	1	0	1	1	1	1	0	0	0	0	0	2	0	1	0	0	0	11
137063	56	0	1	1	0	1	0	0	1	0	0	1	1	0	2	0	1	2	0	0	11
137745	329	0	1	1	0	1	1	0	1	0	0	1	0	0	2	0	1	0	0	2	11
137954	52	0	1	1	0	1	1	0	0	0	0	1	0	0	2	0	0	2	1	1	11
138033	0	0	1	0	0	1	1	1	1	0	0	0	0	0	2	0	0	2	1	1	11
138042	0	0	1	0	0	1	1	1	0	0	0	0	0	0	0	2	0	2	1	2	11

Keystone Property Parcel Scores for NEW HOPE CREEK WATERSHED																					
PID	Length of Stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage	Vacancy Status	Parcel Area	Adjacent to Protected Park or Open Space	Unmanaged Land Cover	Habitat Patch or Corridor	TOTAL SCORE
138095	0	0	1	0	0	1	1	1	0	0	0	0	0	0	2	0	0	2	1	2	11
138435	520	2	1	0	0	1	1	1	1	0	0	0	0	0	0	0	1	0	1	2	11
138443	0	0	1	0	0	0	0	0	0	0	0	1	1	1	2	0	0	2	1	2	11
138695	186	0	1	1	0	1	1	1	1	0	0	0	0	0	2	0	0	0	1	2	11
138782	413	0	1	1	0	1	1	1	0	0	0	1	1	0	0	2	0	0	0	2	11
138787	156	0	1	1	0	1	1	1	0	0	0	1	1	0	0	0	2	0	0	2	11
138806	594	2	1	1	0	1	0	0	1	0	0	1	0	0	2	0	0	0	1	1	11
138997	97	0	1	0	0	1	1	1	0	0	1	0	0	0	2	0	0	2	0	2	11
138999	59	0	1	0	0	1	1	1	0	0	1	0	0	0	2	0	0	2	0	2	11
139000	0	0	1	0	0	1	1	1	0	0	1	0	0	0	2	0	0	2	0	2	11
139329	85	0	1	0	0	1	1	1	0	0	0	0	1	0	0	2	0	2	0	2	11
139488	1113	4	1	1	0	1	1	1	0	0	0	0	0	0	0	0	2	0	0	0	11
139974	0	0	0	1	0	0	1	1	0	1	1	0	0	0	0	2	0	2	0	2	11
139976	0	0	0	1	0	0	1	1	0	1	1	0	0	0	2	0	0	2	0	2	11
140093	282	0	1	1	0	1	1	1	0	1	1	0	0	0	2	0	0	0	0	2	11
140147	0	0	1	1	0	1	1	1	1	0	1	0	0	0	0	0	0	2	0	2	11
141572	360	0	0	1	0	1	1	0	0	0	1	0	1	0	0	2	0	2	0	2	11
141749	35	0	0	1	0	1	0	0	0	1	1	0	0	0	2	0	1	2	0	2	11
143364	301	0	0	1	0	1	0	0	0	0	1	0	0	0	2	0	1	2	1	2	11
150187	122	0	0	1	0	1	0	1	0	0	0	0	0	1	2	2	0	2	1	0	11
150188	105	0	0	1	0	1	0	1	0	0	0	0	0	1	2	2	0	2	1	0	11
174865	105	0	1	1	0	1	0	0	0	0	0	0	1	0	2	2	0	2	1	0	11
174868	115	0	1	1	0	1	0	0	0	0	0	0	1	0	2	2	0	2	1	0	11

Keystone Property Parcel Scores for NEW HOPE CREEK WATERSHED																					
PID	Length of Stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage	Vacancy Status	Parcel Area	Adjacent to Protected Park or Open Space	Unmanaged Land Cover	Habitat Patch or Corridor	TOTAL SCORE
212009	175	0	1	1	1	1	0	0	1	0	0	1	1	0	2	0	1	0	1	0	11
217726	631	2	1	1	0	1	0	0	1	0	0	1	0	0	2	0	1	0	1	0	11

Table G-2. Urban Gem Properties Summary for New Hope Creek Watershed (2021)

Urban Gem Parcel Scores for NEW HOPE CREEK WATERSHED																					
PID	Length of Stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage	Vacancy Status	Parcel Area	Adjacent to Protected Park or Open Space	Unmanaged Land Cover	Habitat Patch or Corridor	TOTAL SCORE
139947	157	0	0	0	0	1	1	0	0	0	1	0	0	0	2	2	0	0	1	2	10
139948	153	0	0	0	0	1	1	0	0	0	1	0	0	0	2	2	0	0	1	2	10
205538	102	0	1	1	0	1	1	0	1	0	1	0	0	0	0	2	0	0	0	2	10
116552	361	0	1	1	0	1	0	0	0	0	0	1	0	0	2	2	0	0	1	0	9
138680	124	0	1	1	0	1	1	1	0	0	0	0	0	0	0	2	0	0	0	2	9
139456	359	0	1	1	0	1	1	0	0	0	1	0	0	0	2	0	1	0	1	0	9
139991	364	0	1	1	0	1	1	0	0	0	1	0	0	0	0	2	0	0	0	2	9
140157	77	0	1	1	0	1	0	0	1	0	1	0	0	0	0	2	0	0	0	2	9
141393	258	0	0	0	0	1	0	0	0	0	1	0	0	0	2	2	0	0	1	2	9
141435	530	2	0	1	0	1	0	0	1	0	0	0	0	0	0	2	1	0	1	0	9
108227	282	0	1	1	0	1	0	0	0	0	0	0	0	0	2	2	0	0	1	0	8
141409	313	0	0	0	0	1	0	0	0	0	1	0	0	0	2	2	0	0	1	0	7
139457	355	0	1	1	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	5
141436	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	4

Appendix H

Critical Area Protection Plan for the Little Creek Watershed

Completed in 2021

1.0 Results

The Little Creek watershed encompasses approximately 16,110 acres (~25 square miles), of which approximately 3,150 acres (~5 square miles) lie within Durham County and approximately 907 acres (~1.4 square miles) lie within the Durham City Limits. Within these 1.4 square miles, 236 total parcels were privately owned and contained a riparian buffer. Based on the initial assessment of qualifying parcels within the City limits, and the scores assigned for the baseline and priority criteria, 10 keystone properties were identified in the Little Creek watershed. There were no urban gems identified within this watershed. Five of the keystone properties were identified outside the City's jurisdictional limits, but within Durham County's jurisdiction. These properties were immediately adjacent to the City limits.

The Little Creek watershed has several unique features that influenced the selection of keystone properties and urban gems:

- Approximately 30% (~916 acres) of the land within this watershed and Durham County is owned by the United States Army Corps of Engineers and is managed by the NC Wildlife Resource Commission as part of the Jordan Lake Gamelands. Most of this property is adjacent to the main stem of Little Creek.
- Approximately 83% (~2,619 acres) of the land within this watershed and Durham County is located within either the Falls/Jordan Lake Protected Area or the Falls/Jordan Lake Critical Area. The northwestern portion of Little Creek watershed within Durham County is not located in any Watershed Protection Overlay zone.
- Although the watershed contains areas of protected open space, there is only one park located in this watershed in Durham County. Meadowmont Park is owned by the Town of Chapel Hill and also contains a trailhead to the Little Creek Trail system.
- There is limited industrial and commercial development within the watershed, mostly due to the large amount of land that is publicly owned. Most of the development within the watershed is residential.

As shown in Table 3 in Section 2.2 of this document, the baseline score for a parcel to qualify as a keystone parcel in the Little Creek Watershed is 7. This value is the same Keystone Parcel baseline as the Ellerbe Creek Watershed and the Third Fork Creek Watershed and represents the lowest minimum criteria. The decision to set the Keystone Parcel baseline at 7 was due, in part, to the low number of privately owned parcels that contained riparian areas and were within the City Limits of Durham. Private parcels did not score highly for several criteria, including proximity to parks, proximity to floodplain, steep slopes, and stream length.

Most of the riparian buffers along the main stem of Little Creek and its tributaries are protected through public ownership or development restrictions through the City of Durham's UDO and state riparian buffer rules. The UDO and state rules, however, are subject to change. Protection through ownership or deed restriction such as a conservation easement is more reliable.

KEYSTONE properties are the highest-priority parcels identified for protection in each watershed that can expand high-quality riparian areas that are already protected, such as existing parks, or that could serve as parcels around which larger protected areas might be built.

URBAN GEMS are properties that contain high-quality riparian areas in heavily urbanized portions of each watershed which are isolated or lack connectivity to other protected open spaces. Although Urban Gems would not qualify as a keystone property, they still hold specific individual characteristics that are deemed particularly worthy of protection.

The watershed-scale map provided in this appendix presents all the qualifying parcels, the keystone properties, the urban gems, and schools, parks, and other protected or public lands. Tables H-1 and H-2 provide the individual scores for each keystone property and urban gem for the baseline and priority criteria. A detailed summary of critical area protection and preservation opportunities are discussed below for the riparian buffers within the Little Creek watershed.

NOTE: The current availability of identified parcels and status of any proposed projects should be evaluated when using this report because the data used in the parcel analysis is from May 2020 and parcels may have since been developed, acquired for development, or acquired by the City. Users of this document should verify that the parcel data and watershed maps are current and reflect existing conditions.

1.1 Little Creek Watershed

Based on the results for the baseline and priority criteria, 10 keystone properties were identified across the entire Little Creek watershed study limits.

The two highest scoring keystone properties (PID 142228 and 143302) border each other and have the same owner. Both parcels are large (54 and 20 acres, respectively), mostly forested, and contain a stream that flows into Little Creek approximately 1,700 feet downstream.

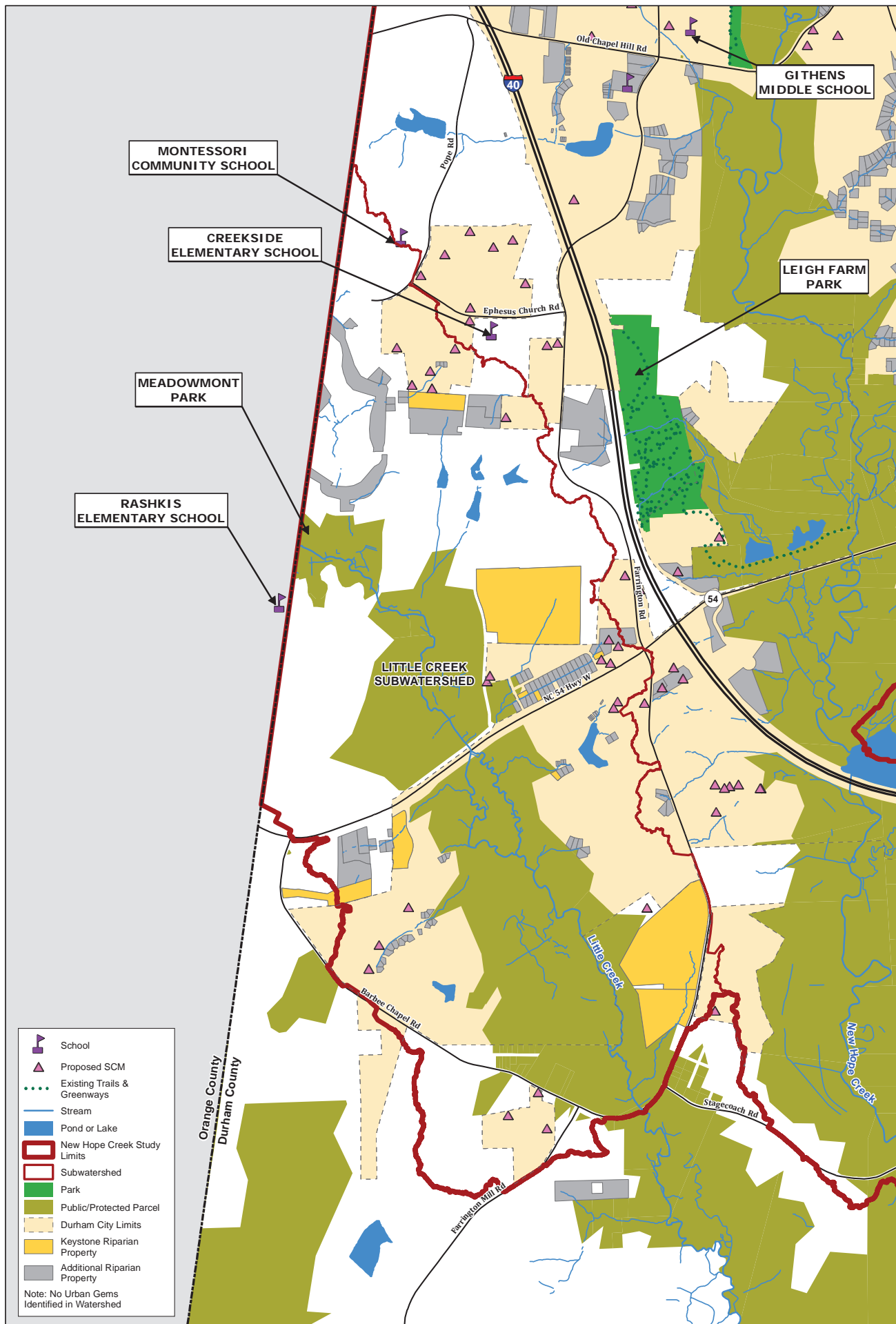
The largest and the highest rated vacant keystone property is PID 141610 (64 acres). This parcel also contains the only segment of stream that was rated as a high-quality stream.

This CAPP analysis and subsequent engagement with various stakeholders did not identify any urban gems within the Little Creek Watershed. Within this watershed, there were very few parcels that were within the City Limits and contained a stream segment that were not already either identified as a keystone property or previously identified as protected open space. Some parcels were suggested by stakeholders as urban gems but were either outside the City Limits or did not meet other qualification criteria (i.e., not an apartment garden or not a private residence).

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Little Creek Watershed
Critical Area Protection Plan Map

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TABLES

Little Creek Watershed

Table H-1. Keystone Property Parcel Scores

Table H-2. Urban Gem Parcel Scores

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Table H-1. Keystone Properties Summary for Little Creek Watershed (2021)

Keystone Property Parcel Scores for LITTLE CREEK WATERSHED																					
PID	Length of Stream (LF) on Parcel	Length of Stream	Not Protected by UDO	Proximity to SCM Retrofit	High-Quality Riparian Buffer	Headwater Stream	Wetlands	Floodplain	Steep Slopes	Rare or Endangered Species or Habitat	Proximity to SNHA	Proximity to School	Proximity to Park	Proximity to Greenway	Existing Riparian Vegetation Coverage	Vacancy Status	Parcel Area	Adjacent to Protected Park or Open Space	Unmanaged Land Cover	Habitat Patch or Corridor	TOTAL SCORE
142228	862	2	0	1	0	1	1	0	1	1	1	0	0	0	2	0	2	2	1	2	17
143302	915	2	0	1	0	1	1	0	0	1	1	0	0	0	2	0	2	2	1	2	16
141610	995	2	0	1	1	1	0	0	0	0	1	0	0	0	2	2	2	0	1	0	13
141884	19	0	1	1	0	1	0	0	0	0	1	0	0	0	2	2	1	0	1	0	10
141784	229	0	0	1	0	1	0	0	0	0	1	0	0	0	2	0	0	2	1	0	8
141628	217	0	0	1	0	1	0	0	0	0	0	1	0	0	2	0	1	0	1	0	7
141756	77	0	0	1	0	1	0	0	1	0	1	0	0	0	2	0	0	0	1	0	7
141791	57	0	0	1	0	1	0	0	0	0	0	0	0	0	2	2	0	0	1	0	7
142360	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	2	0	2	7
207845	365	0	0	1	0	1	0	0	1	0	1	0	0	0	0	2	1	0	0	0	7

Table H-2. Urban Gem Properties Summary for Little Creek Watershed (2021)

[illegible]