



# Conservation Assessment of the Neuse River Lowgrounds and Mill Creek Watersheds in Johnston County

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## ***Introduction***

In the late 1990's Triangle Land Conservancy (TLC) began focusing efforts to protect land within the Neuse River Lowgrounds in Johnston County. Although development pressure in the Lowgrounds has lagged behind other portions of the Triangle, this vast wilderness with many unique natural features faces other pressures such as logging, agriculture and mining which threaten water quality and the natural integrity of the area. During the past 10 years, development pressure in Johnston County has risen dramatically with a population increase of 40% for the County. Completion of the US-70 Clayton Bypass has also reduced the commute times to central portion of Johnston County including Smithfield, further drawing residents who commute to jobs in RTP and points west.

In 2000, TLC with support from the Conservation Trust for North Carolina and funding from the NC Clean Water Management Trust Fund, completed the "Riparian Corridor Design for the Neuse River: From I-95 to Ferry Bridge Road in Johnston and Wayne Counties, North Carolina". The design was limited to an evaluation of parcels along the Neuse River corridor and identified priorities for both restoration and preservation. As part of a renewed effort to protect this significant natural area, TLC applied to the NC Attorney General's Office for an Environmental Enhancement Grant in 2008 to update the 2000 plan and expand the focus area to include the entire Neuse Lowgrounds watershed as well as the Mill Creek watershed, which includes Hannah Creek and several other important riparian corridors, farm and forest land, and cultural resources such as the Bentonville Battleground. The updated assessment will help TLC prioritize which properties to pursue for conservation and will guide landowner outreach. This report summarizes the importance of the Neuse Lowgrounds and Mill Creek watershed, the methodology used in the assessment, and results of the GIS analysis.

## ***Background***

Together, the Neuse Lowgrounds and Mill Creek watershed cover over 178 square miles in southeastern Johnston County. This area represents one of the most rural portions of the greater Triangle region containing productive farms and forest land as well as significant blocks of wilderness. Both areas contain unique natural features found in few other places in North Carolina or the southeastern United States. Bounded by Interstate 95 on the north and intersected by Interstate 40 on the southwest, this area is easily accessible from more urban portions of the western Triangle region. As the local land trust serving Johnston County, TLC is

working to balance growth and development in areas like the Lowgrounds and Mill Creek watershed with protection of the most threatened ecologically and agriculturally important lands.

The Neuse Lowgrounds lie south of Smithfield in Johnston County where the Neuse River spreads into a mysterious swampy quagmire. A vast floodplain four miles wide in places, in reality the Lowgrounds is one of the most extraordinary wilderness areas in the Southeast, essentially undeveloped and roadless for 72 square miles or 36,000 acres. Full of wetlands, sloughs, levees, and extensive mature cypress forests, it is the largest contiguous piece of undeveloped land in the Triangle. Due to the many unique and rare natural communities found in the Lowgrounds, the NC Natural Heritage Program has identified a large portion of this area as having state, regional or local significance. As such, the Lowgrounds area provides exceptional wildlife habitat for neo-tropical birds, fox squirrel, black bear, coyote, bobcat, and other rarities. It is also critical to the City of Goldsboro, which relies on the Neuse River as its primary drinking water supply, and other communities downstream because the massive floodplain is so effective at filtering impurities from the Triangle's urban stormwater.

Hunting, fishing, forestry and limited agriculture define the land uses within the Lowgrounds. Primarily forested, portions of this area have been intensively managed for wildlife and forestry, including clear cutting of timber. Several open agricultural fields are present within the 100-year floodplain creating potential for sediment and other pollutants to enter the Neuse during heavy rain events and flooding.

Although the Lowgrounds provide a natural filter for upstream pollutants, the section of the Neuse River that travels through this area was recently proposed for listing as 303(d) impaired by the NC Division of Water Quality (NCDWQ). NCDWQ defines impaired water bodies as "...those that do not meet water quality uses, such as water supply, fishing or propagation of aquatic life". Impacts to this section of the Neuse are likely a result of non-point source pollution from increasing development upstream, poorly managed agricultural practices, and loss of forested riparian areas. Johnston County's population has exploded over the last several years, growing at a rate of 24% between 2000 and 2006. Although most of this growth has taken place west of I-95, the recent opening of the US 70 Clayton Bypass will likely bring increased development pressure further east in the near future.

Similar to the Neuse Lowgrounds, Mill Creek has a wide floodplain, extending more than a mile in areas. Mill Creek is a major tributary to the Neuse River, and converges with the river in the Lowgrounds in southeastern Johnston County. The creek's

watershed begins southeast of the Town of Benson and extends from west to east. Mill Creek is listed as a Regionally Significant Aquatic Habitat by the NC Natural Heritage Program and is home to several important freshwater mussel species as well as the endemic and State-listed Neuse River waterdog (*Necturus lewisi*) and Carolina madtom (*Noturus furiosus*).

Agriculture continues to be an important part of the Johnston County economy and is still quite prevalent within the Mill Creek watershed, which contains one of the largest concentrations of hog farms in Johnston County. The County recently completed a county-wide Farmland Preservation Plan. TLC is currently working with partners such as Johnston County Soil and Water Conservation District to protect farmland using voluntary conservation easements while also implementing conservation programs and utilizing best management practices to protect water quality.

In addition to its natural resource significance, the Mill Creek watershed encompasses several important cultural and historic areas including the Bentonville Battleground State Historic Site, location of one of the bloodiest Civil War battles fought in North Carolina. Portions of the battleground have been preserved by the NC Department of Cultural Resources and Bentonville Battlefield Historical Association, but large sections remain unprotected. Recognizing the cultural significance of this area, the NC Department of Transportation has designated a scenic byway along several roads that cross through the area. The Blue-Gray Scenic Byway, which extends south along the Lowgrounds through the Mill Creek watershed, weaves past the Bentonville Battleground Historic Site before continuing southeast through neighboring Wayne County.

Due to its natural and cultural significance, TLC has identified the Neuse River Lowgrounds as one of five primary areas across the Triangle on which to focus our conservation efforts. In addition to TLC's interests, the NC Division of Parks and Recreation has identified the Lowgrounds as a desired location for a future state park as well as a potential corridor for the NC Mountains-to-Sea Trail (MST). The MST is a proposed hiking trail that will stretch from Jockey's Ridge on the Outer Banks to Clingman's Dome in the mountains. The MST was adopted by State Parks as a park unit in 2007 and will likely follow the Neuse River throughout Johnston County.

## *Summary of Conservation Assessment*

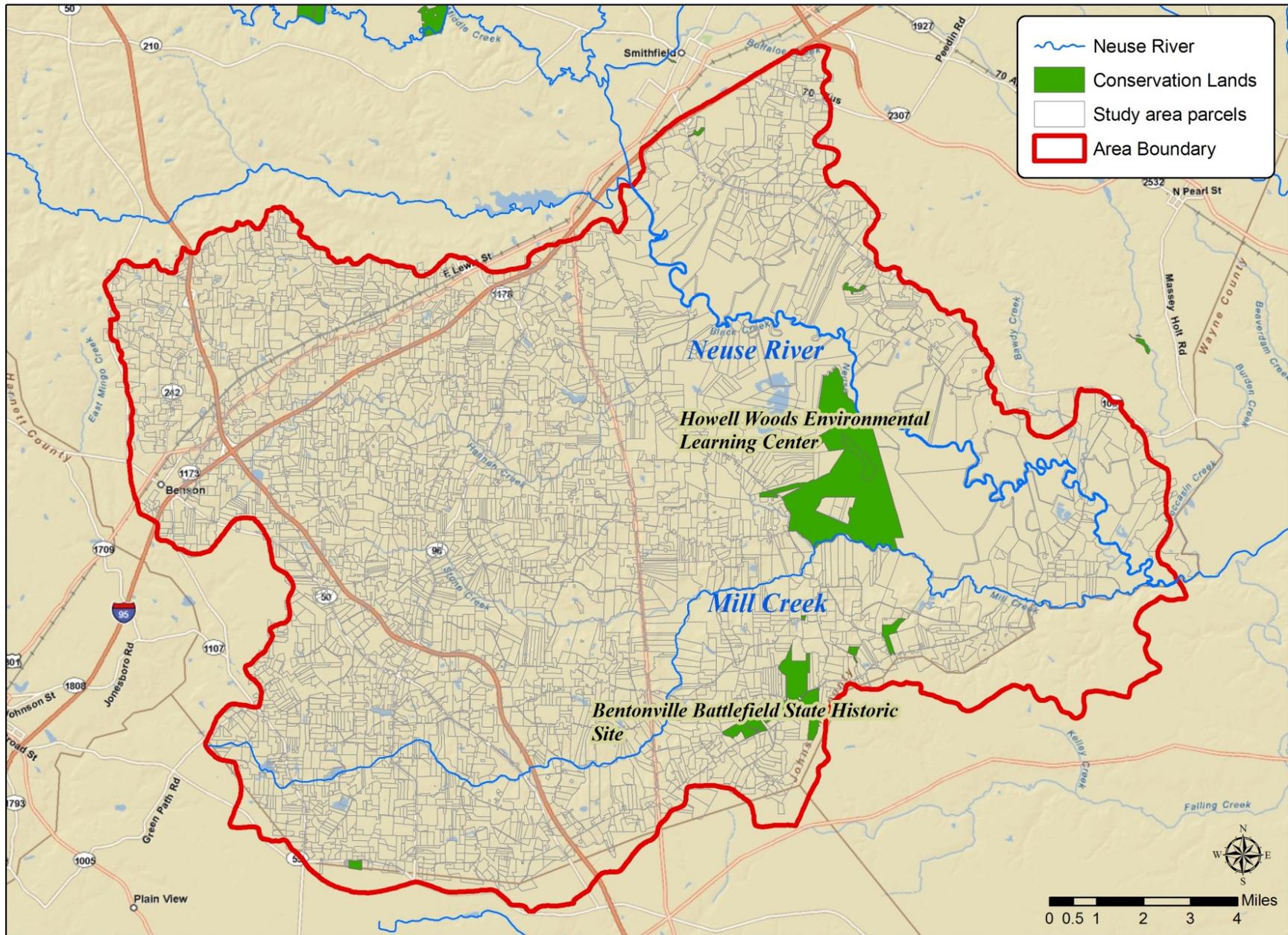
This study assesses tax parcels in the Lowgrounds area for their conservation value within the context of TLC's four primary public benefits. It builds on the assessment completed in 2000 by looking at tracts 10 acres or larger throughout the Mill Creek and Neuse River Watershed. In total, the study evaluated 2,970 tracts totaling 124,172 acres (Map x). These parcels represent 86% of the watershed area which contains a total of 13,075 parcels or 143,750 acres. Parcels 10 acres or less were deemed too small to consider for the analysis and were excluded to reduce processing time. These smaller parcels however may have value if they are adjacent to larger parcels or have some of the characteristics described as criteria in each of the public benefits. Small parcels not included in this analysis may be considered on a case-by-case basis if TLC is approached by the landowners.

As growth continues in the region, protecting the Neuse River Lowgrounds and Mill Creek Watershed will be a critical task for Triangle Land Conservancy, and our local, state, and federal partners. Land protection efforts in the watershed should support one or more of the following public benefits TLC has adopted:

- Opportunities to connect people with nature
- Safeguarding clean water
- Protecting habitat for native plants and animals
- Supporting local farms, forests, and food

The following section provides an update to the 2000 assessment by evaluating parcels within the study area based on the above benefits. A brief description of each benefit is provided within each section of the report. Each section includes a summary of results and the criteria used to identify parcels which, if conserved, help meet the objectives of the specific benefit. A summary of criteria are provided in Table 1. Each benefit has a corresponding map which shows the highest priority tracts. Priority tracts are divided based on tiers. The highest priorities are indicated by Tier 1 tracts, second and third level priorities are indicated by corresponding tiers. This analysis is meant to serve as a starting point for outreach and targeting of high priority parcels, but by no means captures all conservation values of specific tracts.

# Neuse River Lowlands/Mill Creek Conservation Initiative: Study Area



Map 1: Overview of Project Study Area

Table 1: GIS criteria for public benefits

Benefit	Tier	Parcel Criteria	# of Parcels	Total Acres
<i>Connecting with nature</i>	Tier 1	Adjacent to the Neuse River or existing protected land	105	2,239
	Tier 2	Within ¼ mile of a school or documented historic site	55	2,326
<i>Local foods and farms</i>	Tier 1	50 acres or greater in size and has at least 50% prime soils and at least 33% cleared land (crop fields or pasture)	105	7,873
	Tier 2	50 acres or greater in size and has at least 50% prime soils or 50 acres of prime soils	157	26,363
<i>Forests</i>	Tier 1	50 acres or more of the parcel is within 300ft of a stream	9	8,346
	Tier 2	75 acres or more of contiguous hardwood forest cover	73	24,615
	Tier 3	100 acres or greater and contains a portion of a 75 acre or greater contiguous patch of hardwood forest	151	37,003
<i>Water Quality</i>	Tier 1	50 acres or more of the parcel is within 300ft of a stream	150	16,949
	Tier 2	Contains at least 10 acres of wetland or at least 2,000 ft of stream	645	65,200
<i>Wildlife Habitat</i>	Tier 1	Contains a portion or all of a Significant Natural Heritage Area (SNHA) or Element Occurrence (EO) as documented by the NC Natural Heritage Program	353	37,237
	Tier 2	75 acres or more of contiguous hardwood forest cover	73	24,615
	Tier 3	Located within a National Audubon Society – Important Bird Area	345	36,929

Each of these benefits and criteria are described in more detail below.

## *Connecting People with Nature*

Connecting people with nature is essential as we look to balance our increasingly indoor lives. Opportunities for outdoor exercise, fresh air, contemplation, and relief from stress support our health while reminding us of our place in the natural world. Increasing public access and education opportunities in the Lowgrounds will boost awareness and appreciation for this unique area and provide surrounding residents with recreation opportunities that are currently limited.

Currently, only two sites are available for public recreation in the study area: Howell Woods and the Bentonville Battleground. The Rudolph Howell & Son Environmental Learning Center, or Howell Woods, is a unique 2,800-acre property along the Neuse River designed to provide excellent educational experiences while fostering environmental stewardship. The center is owned by Johnston County Community College and offers hiking, camping, canoeing, bird watching, hunting, fishing, and educational classes. The Bentonville Battleground State Historic Site offers visitors an opportunity to explore the battlefields of the largest Civil War battle fought in North Carolina and includes several historic structures and a visitor center. Almost 1,000 acres of the battleground are currently protected and managed by the NC Department of Cultural Resources.

Future priorities for connecting people with nature could include a state or locally owned park, the Mountains-to-Sea Trail, access to sites along the Blue-Grey Scenic Byway, additional river access sites for a paddle trail, expansion of existing recreation areas, and conservation of sites near historic structures or schools.

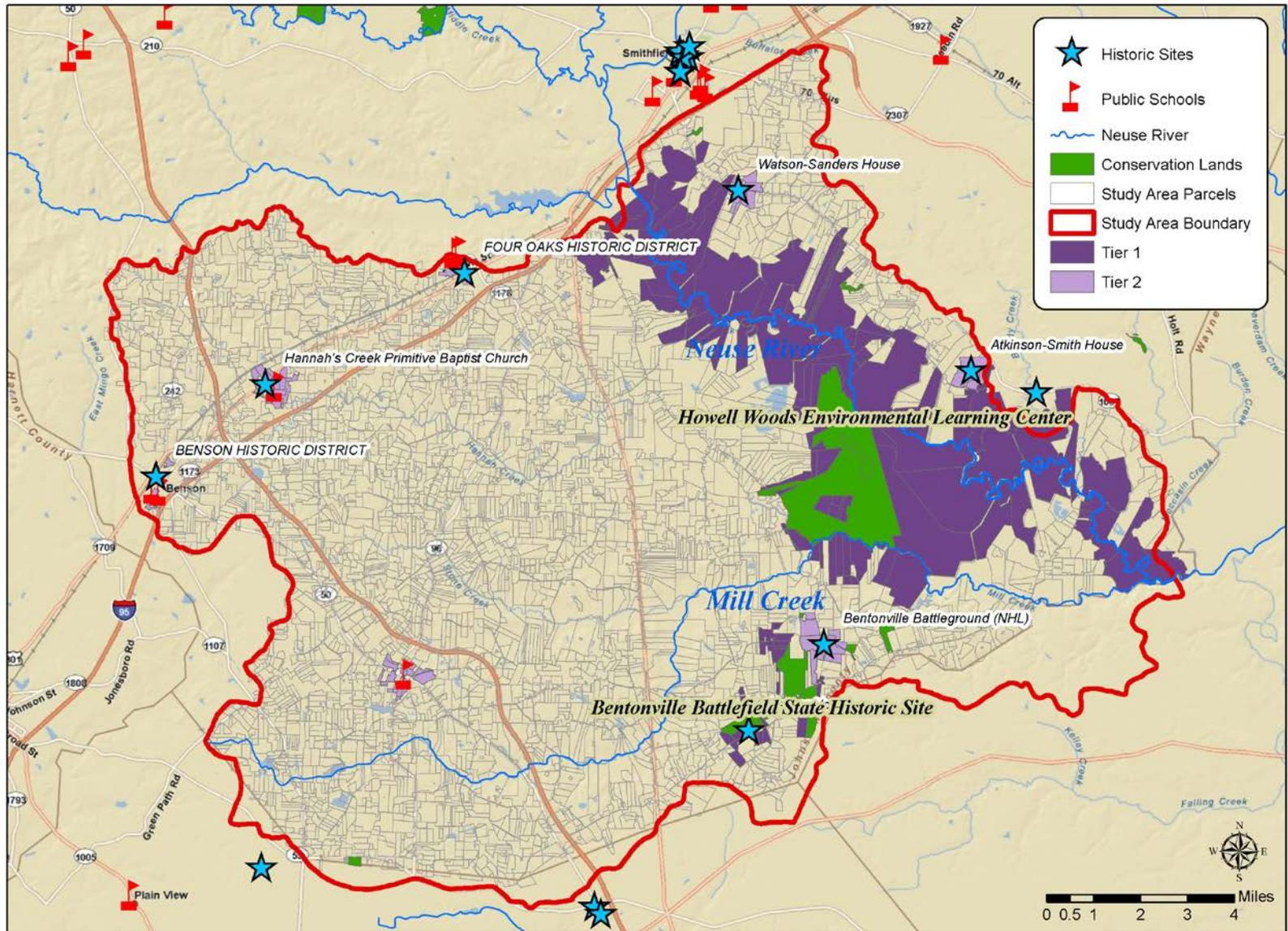
### Criteria:

The following criteria were used to identify sites which could potentially provide opportunities for people to connect with nature in the Lowgrounds area.

Tier 1: Parcel is adjacent to the Neuse River or existing protected land (105 tracts 22,399 acres)

Tier 2: Parcel is within ¼ mile of a school or historic site (55 tracts, 2,326 acres)

# Neuse River Lowlands/Mill Creek Conservation Initiative: Opportunities to Connect People with Nature



Map 2. Results of Connecting People with Nature Assessment

## *Local Farms, Food, and Forests:*

Well-managed farms and associated woodlands enhance our communities by producing food, fiber and wood products, safeguarding clean water, protecting wildlife habitat and scenic vistas, and providing educational opportunities. Farms also create opportunities for supplying fresh food to local markets. Yet, farms and their heritage are vanishing from the Triangle landscape; once gone, they are unlikely to return. Although a majority of the study area is forested, the Lowgrounds has a strong agricultural heritage including areas of productive, prime soils.

Most of the prime soils are located outside of the floodplain areas of Mill Creek and the Neuse River (Map x). Priorities for protecting farmland in the Lowgrounds include those areas with prime soils, open agricultural lands, early succession fields, and farms that are direct-marketing their products to farmers markets, restaurants and other consumers. At the time of this report, data showing locations of farms that are direct marketing products were unavailable and this information was not factored into our analysis. Future assessments should include these farms as they are a priority for protection.

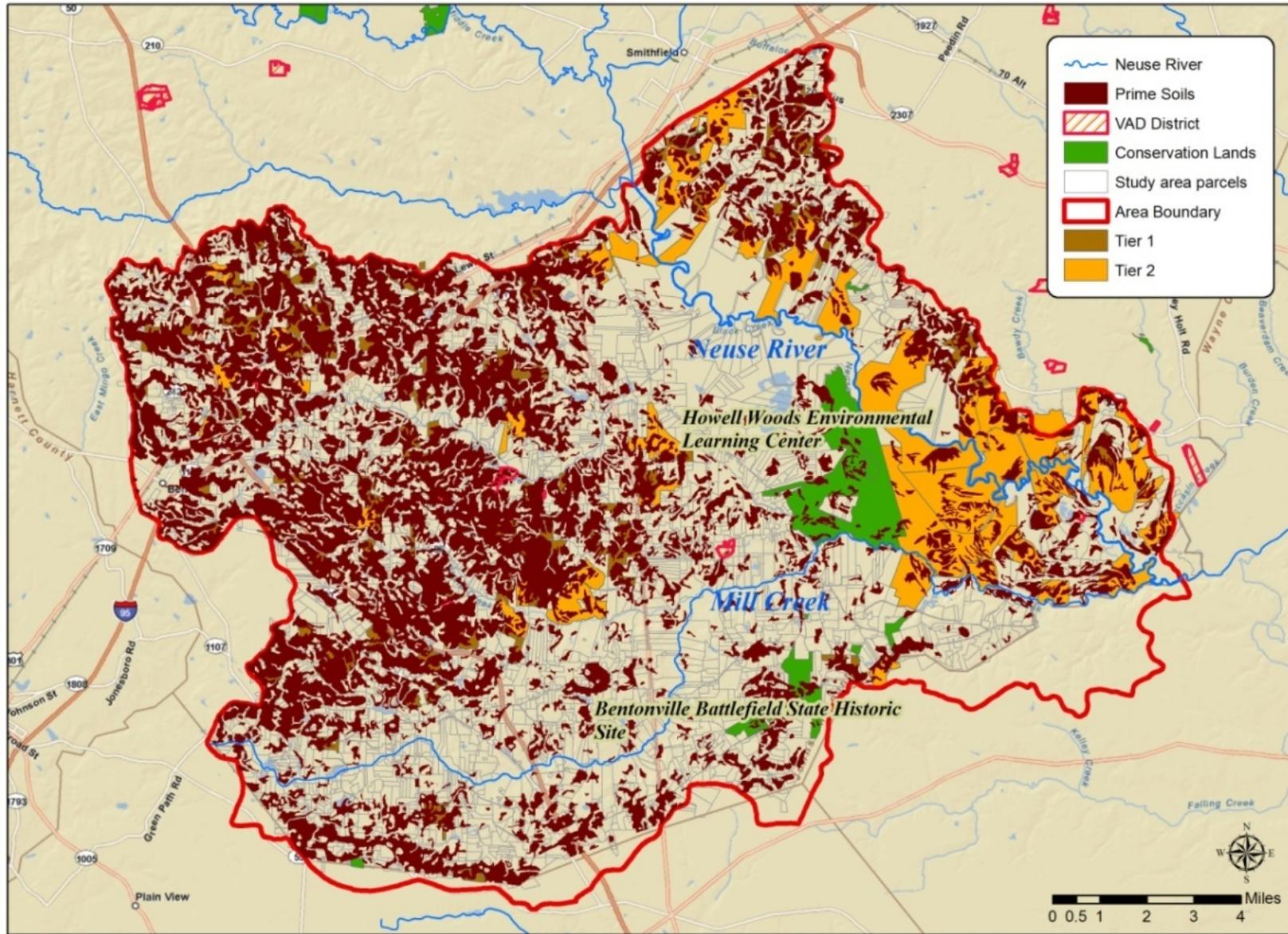
### Criteria

The following criteria were used to identify high priority agricultural parcels in the Lowgrounds area.

Tier 1: Properties that are at least 50 acres in size, have at least 50% prime soils, and contain at least 33% cleared land including crop fields and pasture (105 tracts, 7873 acres)

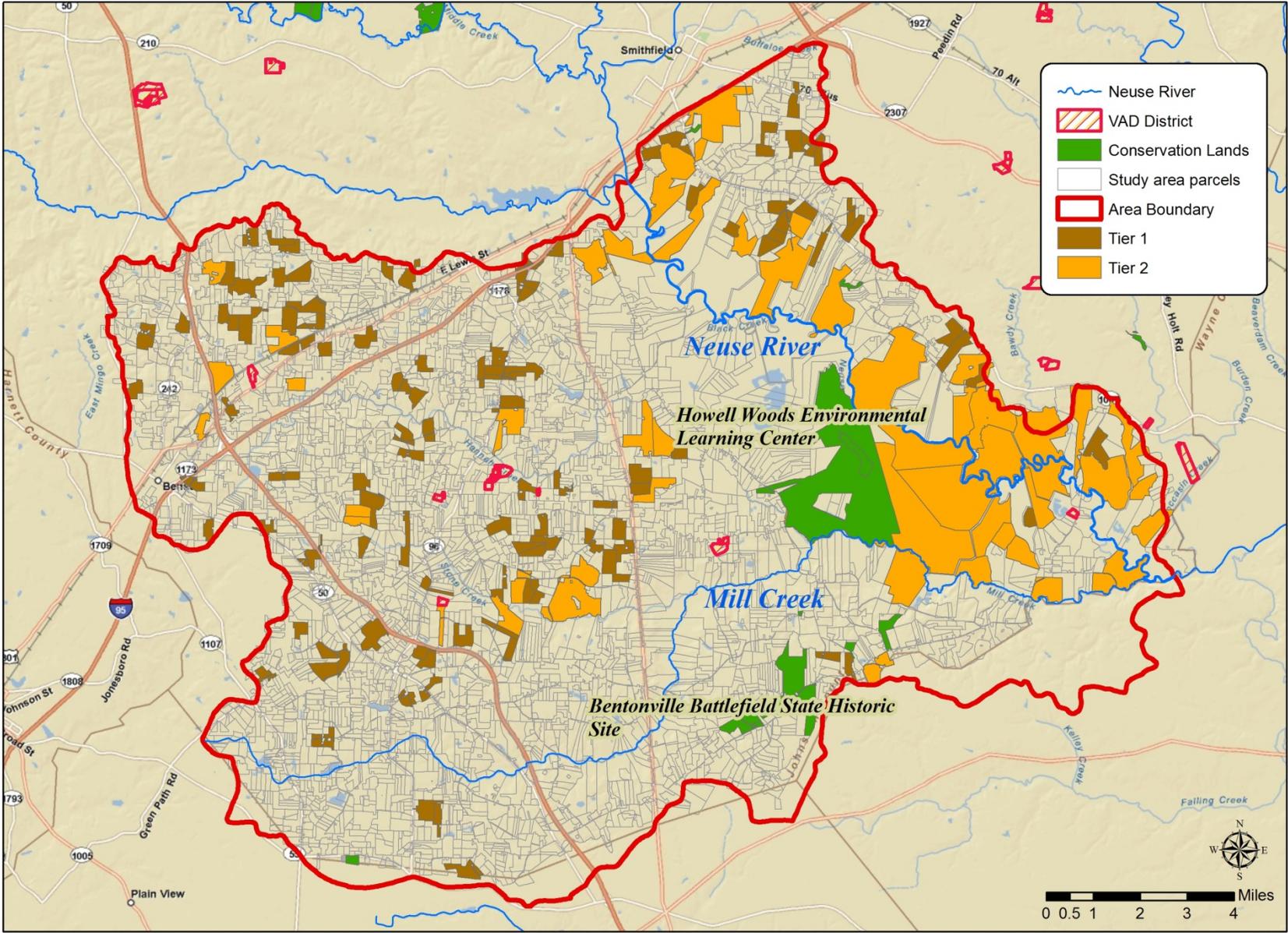
Tier 2: Properties that are at least 50 acres in size and have at least 50% prime soils or 50 acres of prime soils (157 tracts 26363 acres)

# Neuse River Lowlands/Mill Creek Conservation Initiative: Agriculture



Map 3: Prime agricultural soils

# Neuse River Lowlands/Mill Creek Conservation Initiative: Agriculture



Map 4: Results of local food and farms assessment

## ***Forests***

As mentioned, the Lowgrounds area has a rich tradition of forestry. Around the turn of the 20<sup>th</sup> century, the area was well known for its harvest of naval stores and lumber. Excellent examples of bottomland hardwood forest, cypress-gum swamp, mesic mixed hardwood forest, pockets of longleaf pine as well as other unique forest communities can be found in the Lowgrounds and Mill Creek watershed. Bald-cypress black walnut, swamp chestnut oak, American hornbeam, the locally rare silver maple, and many other tree species occur in the Lowgrounds.

Priorities for forest protection include large blocks of contiguous hardwood forests as well as rare forest communities identified by the NC Natural Heritage Program.

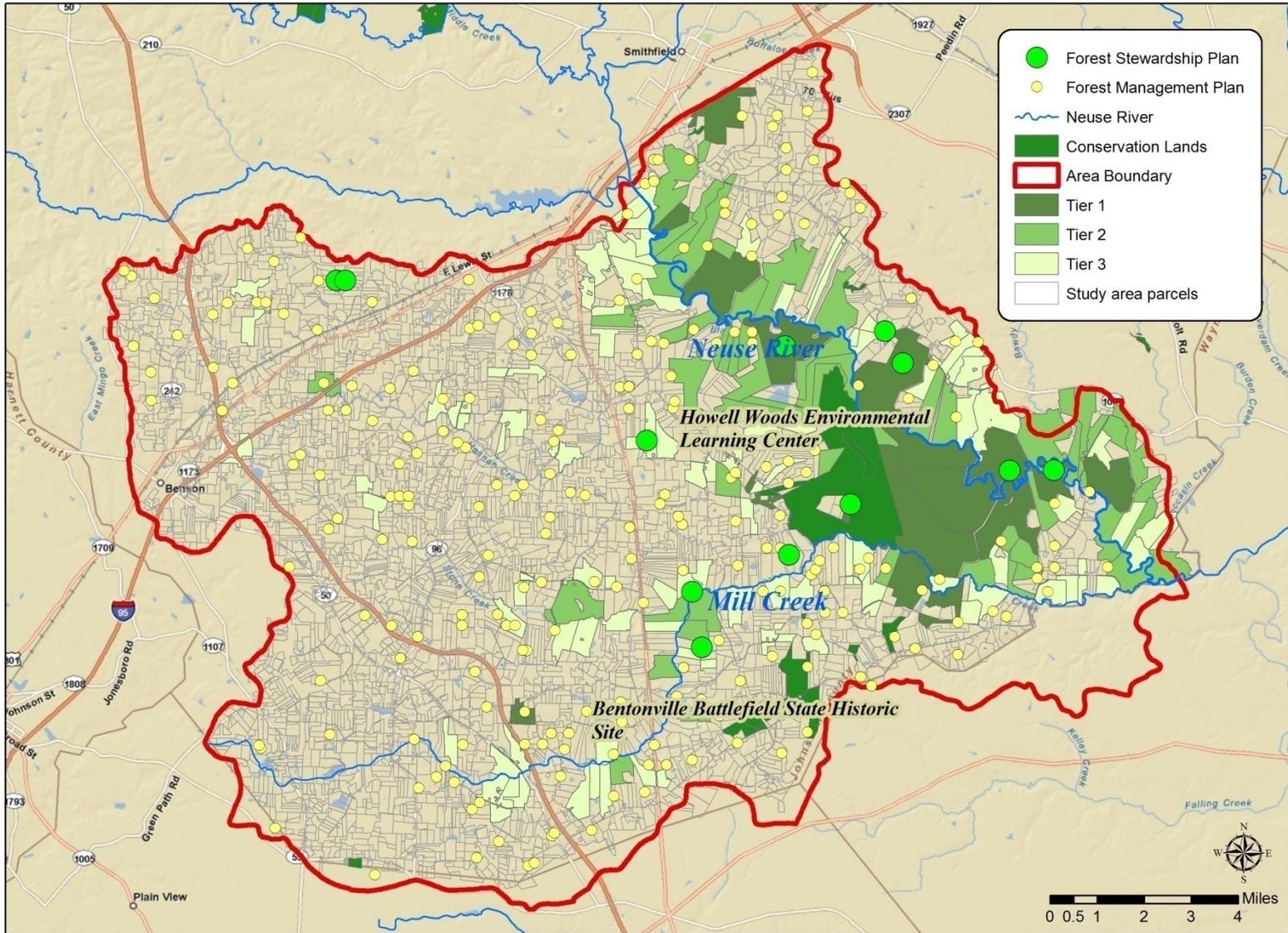
### **Criteria**

Tier 1: Parcels with a 450 acre block of bottomland hardwood forest or is known to support a rare forest community as defined by an Element Occurrence (9 tracts, 8,346 acres)

Tier 2: Parcels with 75 acres or more of contiguous forest (73 tracts, 24,615 acres)

Tier 3: Parcels with at least 100 acres that contain part of a contiguous patch of hardwood forest that is 75 acres or greater (151 tracts, 37,003 acres)

# Neuse River Lowlands/Mill Creek Conservation Initiative: Forestry



Map 5: Results of forestry assessment

## *Water Quality*

Abundant clean water is essential for healthy communities. People drink water and use it for agriculture, food production, industry, and recreation. Population growth in Johnston County has increased demand for clean water while associated pollution has compromised the supply. Portions of the Neuse River within the Study Area are listed as 303d impaired by the NC Division of Water Quality. Protection of riparian buffers and upland areas can filter pollutants and help protect groundwater resources.

The Lowgrounds is known as the water quality filter of the Triangle as its vast floodplain and wetlands help cleanse the Neuse River of pollutants travelling downstream from more urban areas. The Neuse River provides drinking water to the City of Goldsboro in Wayne County and Johnston County is considering an intake that would draw water from Richardson's Bridge Road to fill a nearby quarry for storage.

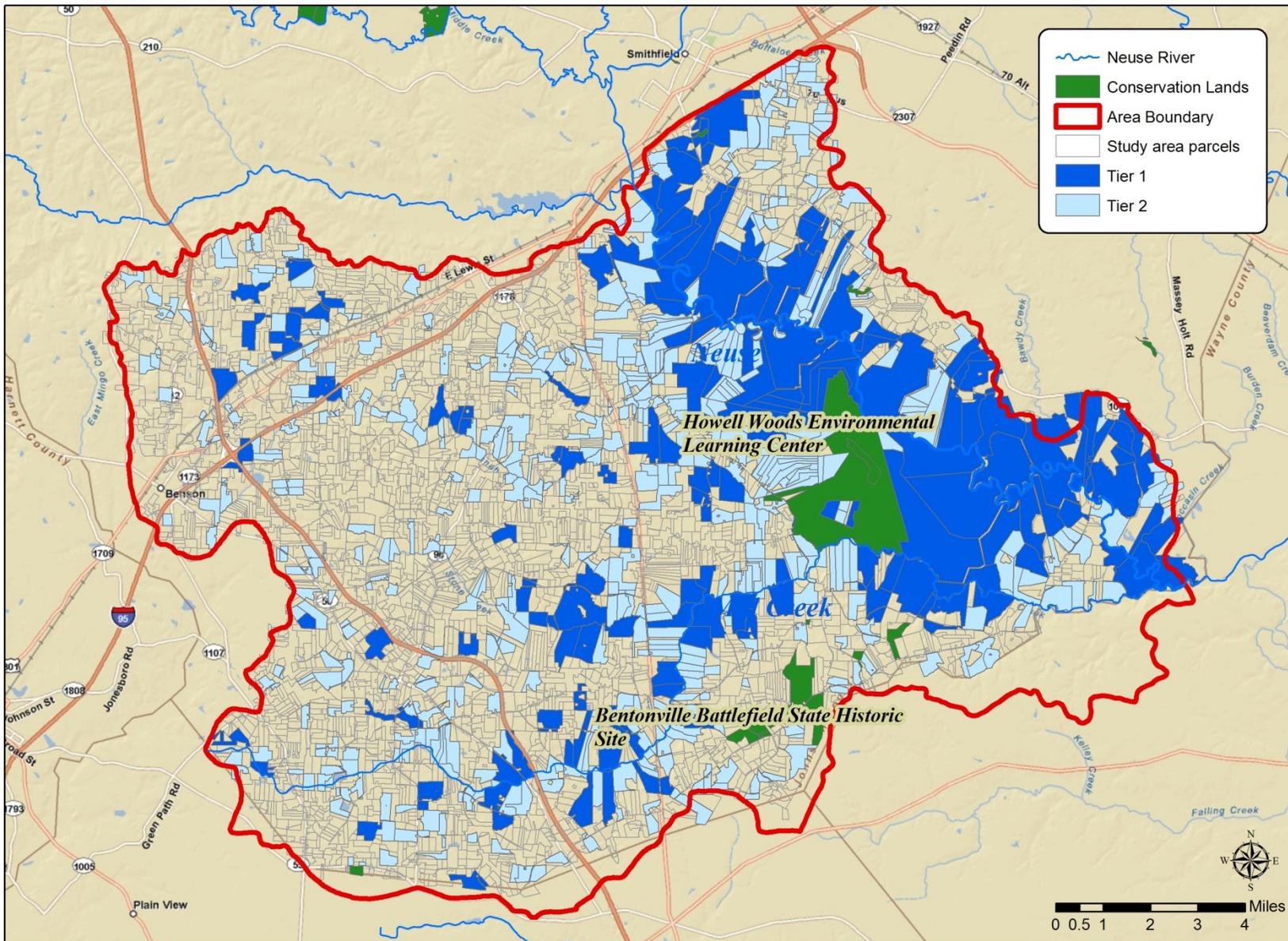
Priorities for conservation include areas that buffer the Neuse River, Mill Creek and their tributaries as well as tracts with significant amounts of wetlands and streams.

### **Criteria**

Tier 1: 50 acres or more of the parcel is within 300ft of a stream (150 tracts, 16,949 acres)

Tier 2: Parcel contains at least 10 acres of wetland or at least 2,000 ft of stream (645 tracts, 65,200 acres)

# Neuse River Lowlands/Mill Creek Conservation Initiative: Water Quality



Map 6: Results of water quality assessment

## ***Wildlife Habitat***

Natural areas and well-managed forests support healthy ecosystems and balance our built environment by providing habitat for native plants and animals. This habitat also supports opportunities for research and education that reveal how human activities change the natural world on which we depend for our basic needs including food, air, and water.

The Lowgrounds area is the last remaining large block of wilderness in the Triangle. The area is home to muskrats, turtles, wood ducks, and several unique river birds as well as deer, bobcat, black bear and other large mammals. The forests provide nesting habitats for dozens of songbirds, including the Swainson's warbler and the significantly rare Mississippi Kite. Much of the Lowgrounds is classified by the National Audubon Society as an Important Bird Area (IBA). In addition several sites along both the Neuse River and Mill Creek have been designated by the state as Significant Natural Heritage Areas (SNHA).

Priorities for conservation include SNHAs as well as areas of known occurrences of rare species (identified as Element Occurrences by the NC Natural Heritage Program). In addition, areas of contiguous hardwood forest and the Audubon designated IBA (Important Bird Area) are considered important. Recent studies have indicated that many upland piedmont species require at least 75 acres of contiguous forest for breeding habitat (add reference)

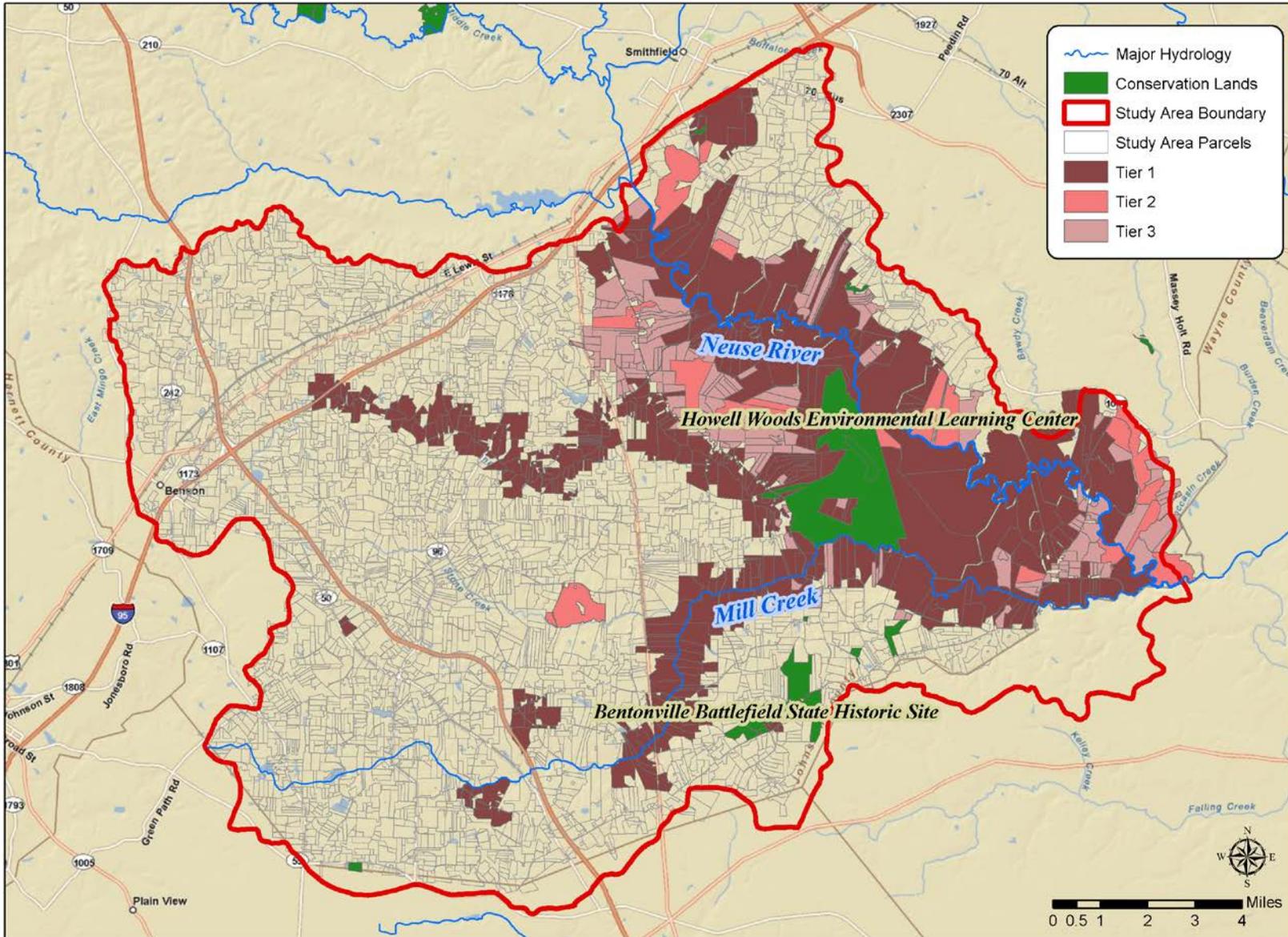
### **Criteria**

Tier 1: Parcel contains a portion or all of a Significant Natural Heritage Area (SNHA) or Element Occurrence (EO) as documented by the NC Natural Heritage Program (353 tracts, 37,237 acres)

Tier 2: Parcel contains 75 acres or more of hardwood forest (73 tracts, 24,615 acres)

Tier 3: Parcel is located within a National Audubon Society – Important Bird Area (345 tracts, 36,929 acres)

# Neuse River Lowlands/Mill Creek Conservation Assessment: Wildlife



Map 6: Results of wildlife habitat assessment

## *Summary:*

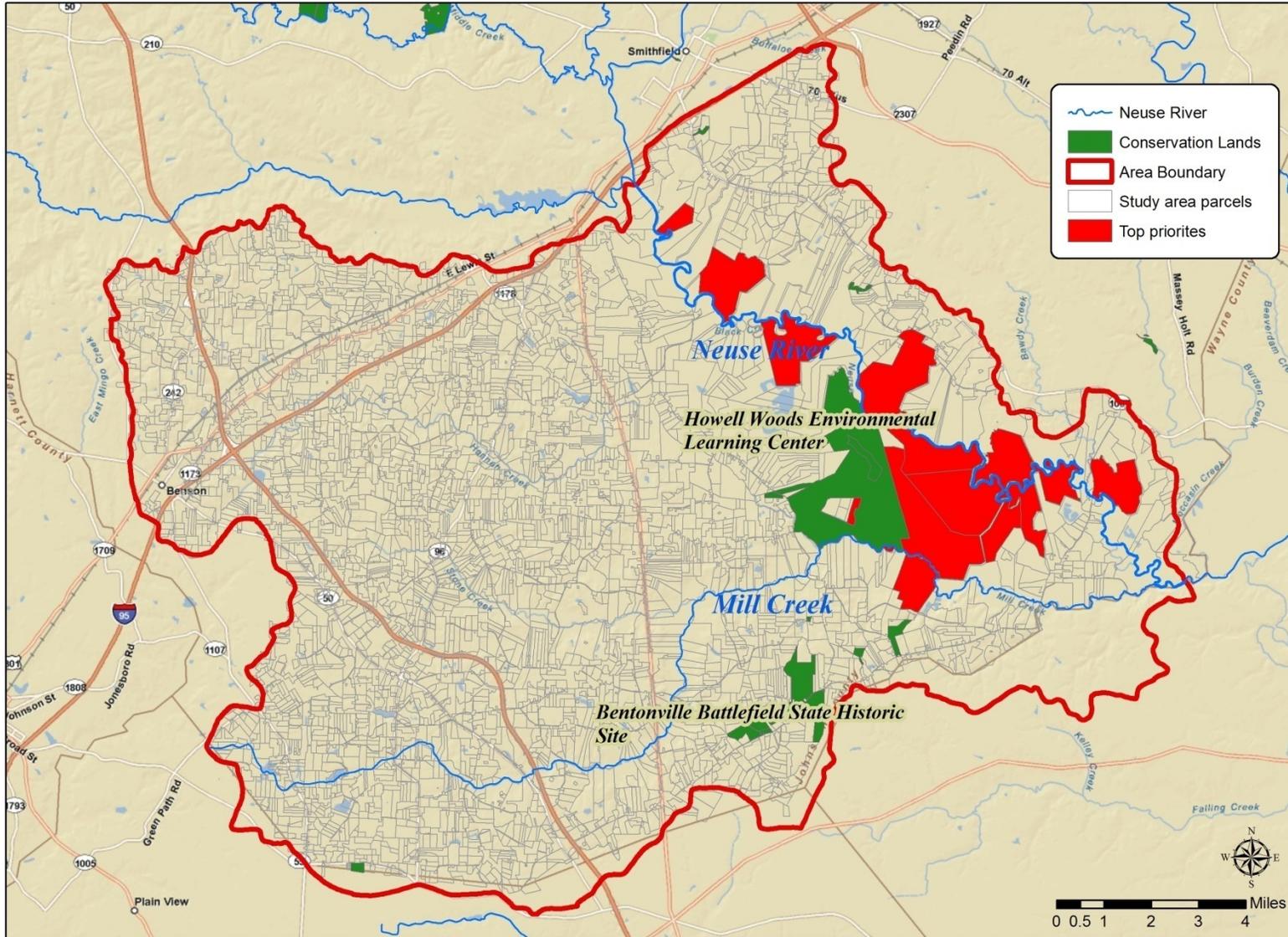
In addition to assessing the tracts based on the individual benefits above, the tracts were evaluated based on cumulative conservation value for all of the benefits. None of the parcels were located in the top tier of all the categories. This is mainly due to the fact that most of the important agricultural areas lie outside of the Neuse River floodplain while most of the critical habitats and natural areas lie within the Neuse River floodplain.

Several tracts met the criteria for all of the benefits except the Local Farms, Foods and Forestry category. 15 key tracts ranked within the top tier in the Connecting with Nature, Wildlife Habitat, Water Quality, and forest categories. These are shown in map 7.

This assessment is meant to serve as an update to the 2000 reports. This report provides much more detail on the natural resources and history of the area and its importance. It is recommended that conservation groups use both of these assessments together to inform their work in the Lowgrounds area.

The Lowgrounds truly is the last great wilderness area of the Triangle. A vast floodplain four miles wide, in reality the Lowgrounds is one of the most extraordinary wilderness areas in the Southeast, essentially undeveloped and road-less for 10 square miles or 50,000 acres. Full of wetlands, sloughs, levees, and extensive mature cypress and bottomland hardwood forests, it is the largest contiguous piece of undeveloped land in the Triangle. As conservation efforts move forward in the state of North Carolina, the Lowgrounds should be considered a high priority for conservation efforts and funding.

# Neuse River Lowlands/Mill Creek Conservation Initiative: Top priorities



Map 7: 15 highest priority tracts