Natural Heritage Inventory

Of

Gaston County, N.C.

North Carolina Natural Heritage Program
Division of Parks and Recreation
Department of Environment and Natural Resources

Gaston County Quality of Natural Resources Commission
N.C. Cooperative Extension

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Acknowledgements

The QNRC Natural Heritage Inventory task group initiated this project in 1996. The group, led by Alan May, also included Bill Craig, Greg Hamm, Craig Lewis, David Lazenby, Mike McCleod, and William Moretz. Sean Cronin, Cooperative Extension Natural Resources Agent served as the first advisor to the task group and was followed by agents Kimberly Lough, and David Fogarty. The inventory work was completed by Habitat Assessement and Restoration Program, Dr. Jim Matthews.

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Several other individuals who were involved in the study or the preparation of this document are noted in the text.

Executive Summary

This document compiles information related to the Natural Heritage Inventory process undertaken during the last few years in Gaston County. It includes background information about the county, the history of the Natural Heritage Inventory effort in the county, and specifics of the inventory process and its findings.

About Gaston County

For at least twelve thousand years, human populations have inhabited the area of North Carolina now known as Gaston County. As part of the central Catawba River Valley, the region was first home to Native Americans and later was explored and settled by Europeans. The first European explorers found a landscape with a relatively mild climate and many natural resources. These and many other factors have made the area an attractive place in which to live.

Today Gaston County supports a growing population of approximately185,000 people. While logging, grazing, and urbanization have brought many benefits to the county, they have also directly and indirectly affected our natural resources. These rapid changes have prompted Gaston County leaders to both inventory and evaluate the health of our environment, and to find ways of preserving the natural resources that make the county attractive to so many people.

The Inventory

The Gaston County Natural Heritage Inventory is a countywide systematic search for the best examples of natural habitats, especially of rare and endangered biological species. Natural habitats are critical to environmental health and quality. They make for more attractive places to live and visit. They also serve as reservoirs of biological diversity and sanctuaries for native plants and animals whose survival may be in jeopardy. The Natural Heritage Inventory of Gaston County represents a major step in the identification and recording of the natural communities of the region, as well as rare and threatened areas and biological species.

Natural Communities

A natural community is, "A distinct and reoccurring assemblage of populations of plants, animals, bacteria, and fungi naturally associated with each other and their physical environment" (Schafale and Weakley, 1990). The search for natural heritage sites and natural communities in Gaston County is not a quest to find where human impact is absent. Reality says that human activity has touched virtually every corner of North Carolina, both directly and indirectly. New roads, agriculture, and urbanization directly impact natural communities. Indirect impact comes from such factors as the introduction of exotic species such as Kudzu, Japanese honeysuckle, and European starlings, as well as the control of natural fires and floods.

Freedom from disturbance is not a definite indication of natural conditions. An old growth forest may represent a relatively unnatural state in a type of community that is subject to natural catastrophic disturbances. Communities are not simple, fixed patterns

on the landscape, but rather are dynamic systems in different stages of recovery from a variety of natural disturbances (*Inventory of Natural Areas of Mecklenburg County, North Carolina*, 1997).

Evaluating Natural Heritage Sites
From 1997 to 1998, teams from the Habitat Assessment and Restoration Program (HARP) and the Schiele Museum examined a total of 111 Gaston County sites. The raw data from field surveys and the experience of professional biologists determined the biological significance of a site. The factors used to determine site significance included:

- Quality, condition, and size of the site
- Rarity of natural community types and rare species present
- Ecological integrity or long-term viability of the site

Additional considerations included overall floral and animal diversity, presence of species that are uncommon or that are ecological indicators of special habitats, potential animal habitats, and degree of connectivity with other natural areas. Determining the biological significance of a site is an objective process. Ownership or prospects for conservation of a site do not influence the evaluation of site significance.

Results of the Inventory
Of the 111 sites surveyed in Gaston County, 12 were determined to contain species or habitats of State or Regional significance. In this report, these sites are rated as "A" sites. An additional 25 sites were determined to be of Gaston County significance. These sites are rated as "B" sites. The remaining 74 sites did not meet the criteria of either the "A" or "B" sites, but many were determined to have habitats and species of interest. These sites do have value as natural areas and wildlife habitat. The inventory of these other 74 sites may be of value in evaluating lands for open space preservation in Gaston County.

Only the "A" and "B" site information is included in this report. Information about the additional sites can be obtained from either the Schiele Museum or the Cooperative Extension Office in Gaston County.

Significant Sites
Gaston County's most significant sites are distributed across the county. They range from Crowders Mountain in the southwest corner to the Richard Rankin property, east of Stanley, and the Armstrong Ford site at the mouth of the South Fork River.

Crowders Mountain State Park is the largest natural heritage site in the county. It covers nearly 5,000 acres of topographically, botanically , and zoologically diverse land in Gaston and Cleveland counties. Six types of natural plant communities are found in the park, and the area supports a diversity of wildlife species. Some animals documented in the park have not been documented elsewhere in Gaston County. A second natural heritage site, Pinnacle Road, has recently been incorporated into the park. This site is most significant for the occurrence of Dwarf juniper (*Juniperus communis*) along its ridgeline.

Six of the county's twelve "A" sites are significant because of the presence of the Big leaf magnolia (*Magnolia macrophylla).* This magnificent plant has the largest simple leaf of any species in the temperate world, and one of the largest flowers. Sites at which *Magnolia macrophylla* are documented include the following:

- Twin Brooks
- Richard Rankin Property
- Armstrong Ford
- Laurel Hill
- Jean Rankin Property
- Forney Rankin Property

Two sites in the survey, the Friday Site and the Jenkins Site are important because they provide habitat for Bog turtles. The Bog turtle is the single most significant rare animal species surviving in Gaston County.

The Stagecoach Road site is the largest and best preserved granitic outcrop in the county. Its thin soils are dominated by hickory species and it is also home to several smaller species such as *Talinum teretifolium* (Fame flower), *Diamorpha* (*Sedum*) *smallii* (Small's sedum), and *Hypericum gentianoides* (Pineweed) that are found only in this type of habitat.

The Kenneth Oates Farm contains an old growth forest dominated by beach, yellow poplar, oaks, and maples. Some trees at the sites have diameters of nearly 3 feet. This site is also home to *Cypripedium calceolus* (Yellow lady slipper).

As a result of the Natural Heritage Inventory, three plant species were documented for the first time in Gaston County. These include *Aster georgianus* (Georgia aster), Helianthus schweinitzii (Schweinitz's sunflower), and *Schisandra glabra* (Magnolia vine). This is the first report of *Schisandra glabra* anywhere in the Piedmont of either North or South Carolina.

Looking Ahead

The Natural Heritage Inventory in Gaston County was carried out so that the information gained could be put to use. This document will be an important tool as the county conducts its long-range planning efforts. The information here is also of vital interest to land conservation groups such as the Catawba Lands Conservancy that wish to prioritize their use of limited funds. In addition, this document serves to help educate citizens and students about the natural resources of the area in which they live.

While this document represents a compilation of the information gathered during three years of studying the county's natural resources, the project is not complete. Natural habitats change – sometimes on their own and sometimes due to human impact. This document will undergo a periodic review and update during the coming years. In

addition, in-depth studies of the fish and insect populations of Gaston County will give us even greater insight into the changing environment.

The authors of this document wish to thank the Gaston County Board of Commissioners for their support of this project. We also recognize the Schiele Museum, the North Carolina Extension Service in Gaston County, and the Gaston County Quality of Natural Resources Commission for their leadership in this effort.

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Chapter 1 - General Features of Gaston County

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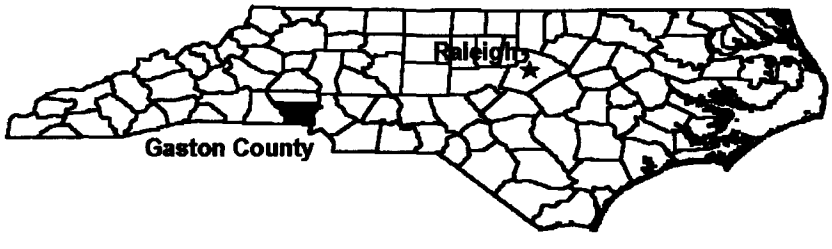
Location

Gaston County is located in the southwestern portion of North Carolina near the center of the Piedmont Crescent, a large, sprawling urban area stretching across North Carolina, South Carolina, and Georgia. The North Carolina/South Carolina state line forms the county's southern border. The Catawba River forms the eastern boundary. Gastonia, the urban center and county seat, is located approximately 160 miles southwest of Raleigh, North Carolina; 110 miles north of Columbia, South Carolina; and 220 miles northeast of Atlanta, Georgia. See Figure 1.

Figure 1. Location of Gaston County, North Carolina.



History

Gaston County is a rapidly changing landscape of people and activities. Human populations have inhabited the area for approximately 12,000 years. Native American inhabitants were followed by European explorers and ultimately Euro-colonial settlers.

Native American Populations

Native American populations lived in the central Catawba Valley beginning at least 12,000 years ago. European explorers such as Juan Pardo in 1566 and 1567 (DePratter et al., 1983), Lederer in 1670 and John Lawson in 1701 (Lawson, 1967) provided eyewitness accounts suggesting that many of the late prehistoric and protohistoric groups

in the southwestern Piedmont were related to complex chiefdoms in Georgia and South Carolina. The protohistoric group that inhabited the area is known as the Catawba, one of the more complex, densely populated chiefdoms of the southern Piedmont.

Growing European populations in the early 1700s brought smallpox and increased the internal stress and warfare among Native American groups. Catawba populations were devastated. Their numbers, estimated at 4,600 in 1682, dwindled to approximately 1,000 by 1761 (Swanton, 1946:104-105). They offered no resistance to the early German and Scots-Irish settlers from Pennsylvania (Sharpe, 1961:1161-1162).

The Catawba often were allied with the English colonial government against the French but later sided with the colonists against the Cherokee and the British (McCabe, Hargrove and Cross, 1978). Settlers increased after the American Revolution, and the Catawba were gradually forced from their homelands and finally were given a reservation along the Catawba River near Rock Hill, South Carolina (Swanton, 1946; Hudson, 1976).

Early European Exploration and Settlement

Early explorations of the Spanish and the English described a landscape covered with mixed deciduous forests interspersed with prairie segments. The prairies were covered with grasses such as switch grass, Indian grass, bluestem or broomsedge and wildflowers such as Schweinitz's sunflower, Georgia aster and Prairie dock.

Formation of Gaston County and Early Industrialization

Gaston County was formed from Lincoln County in 1846. Legislation creating the county required the construction of a courthouse, a jail and stocks (which were by then rare in other parts of the country) at the county seat of Dallas (Public Laws of North Carolina, 1846-1847:c. 24, 25). The major agricultural crop of the county may be inferred from its nickname: "the banner corn whiskey county of North Carolina".

Cotton was also an important crop. This and the availability of water power from the county's rivers, attracted textile manufacturers and by 1846, three major cotton textile factories were operating in the county (Cope and Wellman, 1961:72; Separk, 1949). The Woodlawn Mill and Stowe's Factory were located on the South Fork of the Catawba River and the Mountain Island Mill was located on the Catawba River.

The Mountain Island Mill was founded by John Tate and was housed in a four story red brick building. The Woodlawn Mill was built by John Caleb Lineburger and others, and operated 600 spindles (Cope and Wellman, 1961:70). The successful use of women in the work force at Woodlawn inspired Jasper Stowe to seek female employees for his factory, but the labor force was small. Stowe then hired young men to court the young women and entice them to come to work for Stowe (Cope and Wellman, 1961:72). All three of these mills were profitable and prosperous prior to the beginning of the Civil War.

The Civil War and Its Aftermath

The Civil War brought economic disaster and changed land use patterns in the county. Textile machinery was old, worn out and difficult to replace. A warehouse fire that destroyed 1,000 bales of cotton nearly put the Woodlawn Mill out of business, and Stowe's Factory was almost idle (Cope and Wellman, 1961:104). One hope for recovery lay in farm production, but with the large number of freedmen competing for farms and labor, the return of prosperity was uncertain. A major problem for the area was one of transportation.

With the coming of the railroad, stations quickly grew into towns, which in turn were followed by industry looking for areas where labor was available. In 1874, the Mount Holly Cotton Mills were built in an area adjacent to the bridge where the Wilmington, Charlotte and Rutherford Railroad crossed the Catawba River (Cope and Wellman, 1961:109). Later that same year, the Spencer Mountain Mills were constructed on the South Fork of the Catawba River (Cope and Wellman, 1961:109). In 1881, there were six cotton mills employing 350 workers including 113 children under the age of fifteen in Gaston County (Branson, 1880; Cope and Wellman, 1961:114). During this period, other mills that were established included the McAden Mills in 1881, Tuckaseegee Manufacturing Company in 1883 and the Hooper Manufacturing Company in 1885 (Branson, 1881, 1883, 1885).

These and other companies located near the railroads formed an east-west corridor through a growing Gastonia, which, after two unsuccessful attempts, was made county seat in 1909 (Sharpe, 1954-1965:II, 766, 772-781).

Development Since 1900

The flood of 1916 was a natural disaster of major import. It slowed growth and development within the county for several years. Since that time, growth has continued to the present. By the 1960s, about 200 companies were involved in some form of textile production, earning for the county a reputation as the largest textile center in the world (Sharpe, 1954-1965:II, 769). This foundation has aided in the emergence of a diverse economic base throughout the county. In 1997, Gaston recorded more than $920 million in annual payroll for the industrial sector alone. Related areas, such as machining, plastic and rubber, and transportation equipment have also developed significantly.

The industrial sector is primarily responsible for the emergence of several sophisticated facilities featuring the most modern technology and automation in the world. An example is the recent location of Buckeye Technology in the area. Their $100 million investment is the largest single industrial project ever completed in Gaston history. It includes the world's largest fiber technology-airlaid paper plant and provides 220 of the region's highest paying jobs.

Gaston's work force is more than 100,000 strong, and as such is the esecond largest in the Charlotte region. While textiles remain the most important industry, the county now produces agricultural commodities, heavy machinery, paper products, chemicals, motor vehicle parts and mineral byproducts (Gaston County Economic Development

Commission.) Gaston residents also work in a number of non-manufacturing sectors such as services and retail.

The Gaston Historical Society

The cultural heritage and history of the county has been supported by an active Historical Society founded in 1946 (Brengle, 1982:41). In the early 1970s, this group's activities came to the attention of the North Carolina Department of Archives and History, which began research on several properties now listed in the National Register of Historic Places. In addition, a joint program between the Departments of Transportation and Cultural Resources resulted in the placement of ten highway markers of statewide historical significance in Gaston County (Brengle, 1982:41). Eight properties in the county have been nominated to the National Register with others proposed for consideration.

Topography and Physiology

Gaston County lies within the Southern Piedmont physiographic region. Covering 234,890 acres or 364 square miles, it is 27th in size of North Carolina's 100 counties. Elevation ranges from 587 feet above sea level in the southeast corner of the county to 1,705 feet above sea level in the southwest, at the pinnacle of the Kings Mountain Range. Most of the land is at an elevation of between 700 and 1,000 feet, with the average elevation being 825 feet.

The landscape is gently rolling or hilly , although as noted in Table 1, the central and western parts of the county contain several prominent ridges and smaller mountain ranges.

Table 1. Prominent Topographic Features in Gaston County.

NAME	FEET ABOVE SEA LEVEL	LOCATION
Kings Mountain Pinnacle	1,705	Southwest
Crowders Mountain	1,624	Southwest
Spencer Mountain	1,304	Northeast of Gastonia
Pasour Mountain	1,100	Northwest
Jackson's Knob	1,080	South of Gastonia

Water Resources

Gaston County has an abundant supply of both surface water and groundwater. Surface waters cover 6,074 acres. Streams and lakes provide water supplies to cities and towns for domestic, commercial and industrial use, power generation, and space for outdoor recreation.

Watersheds and Channel Morphology

As shown in Figure 2, the county has six main watersheds. The dominant surface water drainage pattern is northwest to southeast. Most streams drain into either the Catawba River or its principal tributary, the South Fork of the Catawba River. Streams in the Piedmont generally have a gradient between 0.2% and 2.0%.

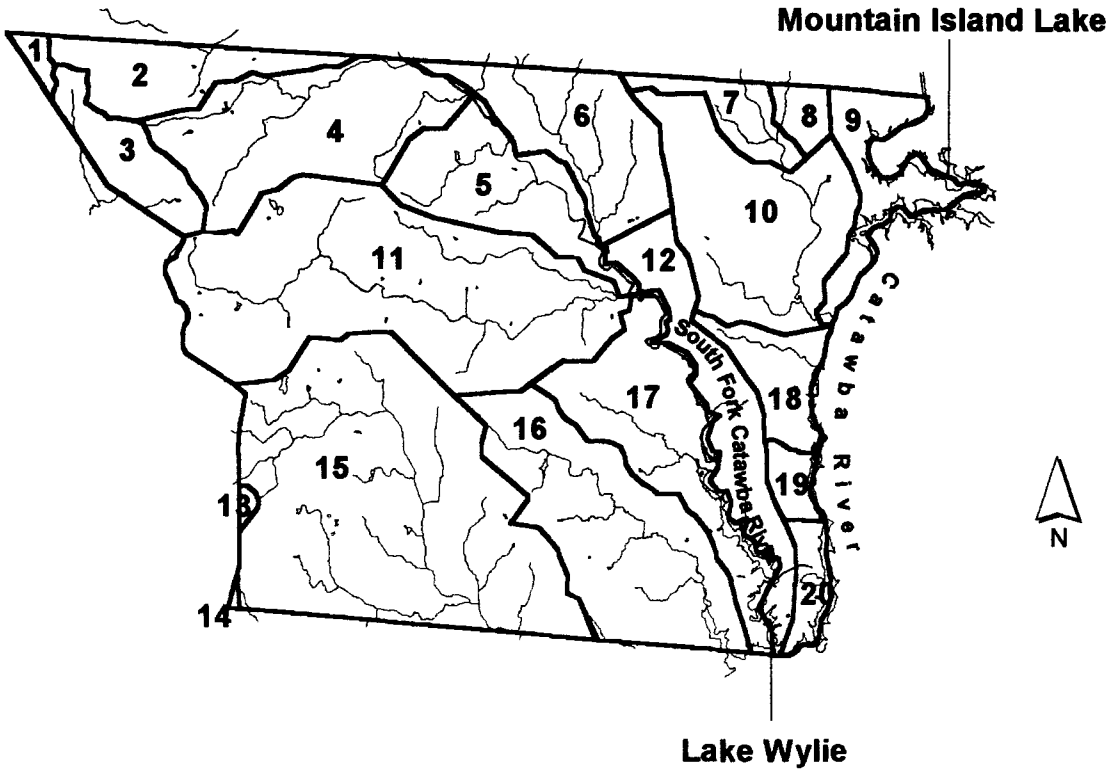
Channel morphology varies. Stream structure ranges from relatively stable bedrock/cobbles/pebble substrates to sandy, shifting bottoms. Though flood plains typically are narrow, flood plain swamp forests are common and extensive. Woody snags and debris dams in Piedmont streams provide critical habitats for aquatic biota. Piedmont streams tend to carry larger suspended solid loads than streams in coastal or mountain regions.

Reservoirs

As shown in Figure 2, Mountain Island Lake and Lake Wylie, two reservoirs on the Catawba River, form the northwest and southeast boundaries of Gaston County. The primary use of these lakes is for drinking water supplies, recreation, and production of electricity. Other surface water bodies include small, manmade farm ponds and lakes. The larger lakes encompass about 4,224 acres of the county and about 1,850 acres are in smaller lakes and ponds (defined as fewer than 40 acres of water).

Surface water quality in Gaston County is generally clean enough for swimming, fishing and use as a drinking water source. However, some stream reaches have seen the impact of municipal and industrial waste discharges and nonpoint source pollution. This non-point pollution is carried by rainwater runoff from streets, parking lots and industrial areas.

Figure 2. Surface Hyrdrology of Gaston County.



Map ID	Hydrologic Unit Name	Acres	Hydrologic Code
1	Above Reservoir	876.34	3050105100010
2	Indian Creek	8,404.38	3050102050010
3	Muddy Creek	6,053.48	3050105100020
4	Beaverdam Creek	19,405.17	3050102050020
5	Rattle Shoals Creek & S. Fork Catawba	9,263.16	3050102070010
6	Hoyle Creek	13,824.27	3050102060010
7	Leepers Creek	3,559.83	3050101160010
8	Killian Creek	1,826.93	3050101160020
9	Johnson Creek & W. Side Catawba	7,678.05	3050101160030
10	Dutchmans Creek	19,593.57	3050101160040
11	Long Creek	38,435.25	3050102070020
12	South Fork Catawba	13,046.41	3050102060020
13	Dixon Branch	466.87	3050105120010
14	Clark Fork	31.01	3050105140010
15	Crowders Creek	44,528.10	3050101180010
16	Catawba Creek	22,419.02	3050101180020
17	Cramerton	14,089.98	3050102070030
18	Catawba Heights	5,558.81	3050101160050
19	Paw Creek	2,306.05	3050101170030
20	Neal Branch & Beaverdam Creek	1,926.33	3050101170040

Groundwater

Groundwater supplies drinking water to about 54% of Gaston County's population. Bored wells generally range from 40 to 60 feet in depth, with a diameter of 24 inches. Drilled wells are more reliable and sanitary and rarely go dry. The average yield from drilled wells is 10-12 gallons of water per minute.

While groundwater is generally of good quality in Gaston County, there have been a total of 298 investigated incidents of contamination in the county since 1990. Of those, contaminated groundwater occurred in 97 cases. Leaking underground storage tanks, including home heating fuel tanks, have caused most of these incidents. Other causes have included intentional dumping, leaking landfills, and leaking storage ponds and lagoons.

Climate

The climate of Gaston County is mild, humid and relatively complex due to its proximity to both the mountain and coastal regions of the state. The annual average temperature is 61° Fahrenheit. The average annual low and high temperatures are 50° F. and 72° F., respectively.

The average yearly precipitation is approximately 47 inches, distributed almost homogeneously throughout the year. About 62% of each year is sunny. Average annual wind speed is about 7.5 miles per hour.

Seasonal Changes

Daily winter temperatures average in the low 40° F. range and winter precipitation averages 11.98 inches. Most winter precipitation is in the form of rain. Average snowfall is 2.6 inches. Snow seldom accumulates on the ground for more than a few days.

The most extreme climate changes occur during the winter, when cold fronts from the west, northwest and northeast meet with coastal storms from the Gulf Stream. Snow occurs when warm, moist air from the coastal storms hits the mountains and rises. In another scenario, cold air damming occurs as cold, dry air is pushed against the mountains and is overlain by warm, moist coastal air. This causes icing conditions.

Spring and fall temperatures average in the low 60° F. range. Average precipitation during spring is 11.69 inches, with 0.7 inches in the form of snow. Average fall precipitation is 10.45 inches.

Summers are warm and humid, with average daily temperature in the upper 70° F. range. Average summer high temperatures are in the 80° F. range. Average summer precipitation is 12.60 inches.

Geology and Mineral Resources

Three geologic belts, the Inner Piedmont Belt, the Kings Mountain Belt, and the Charlotte Belt converge in Gaston County. The dominant rock types in these belts are as follows:

- Felsic (light colored) igneous intrusive
- Intermediate and mafic (dark colored) igneous intrusive
- Metamorphosed intrusive
- Volcanic
- Sedimentary

Intense heat and pressure have altered the metamorphic rock in this area into gneiss, schist, and phyllite. Most rock formations are heavily weathered, resulting in a land surface of decomposed rock and thick soil profiles. The higher elevations such as Crowders Mountain, Kings Mountain Pinnacle and Pasour Mountain have rock that is much more resistant to weathering.

Mining and Quarrying

Several types of rocks and minerals have been mined and quarried in the county. The most important mineral resource is lithium. The Tinspodumene Belt, a zone of rock along the boundary between the Inner Piedmont and Kings Mountain belts, contains the largest reserves of lithium in the western hemisphere. Tin and lithium-based pegmatites (course-grained granite rocks) in the Tinspodumene Belt are mined for lithium, and also produce by-products of feldspar and scrap mica. Sand and crushed stone are also mined and quarried in the area.

According to the *Soil Survey of Gaston County* (1989), historically significant mineral deposits in Gaston County include the following:

- Barite, mined at four sites in the southwest corner from veins enclosed by sericite schist.

- Gold, mined at more than twenty sites, the most productive being the Kings Mountain mine from 1820 to 1895.

- Iron, mined in the Kings Mountain belt from before the Revolutionary war to the 1890s, when the shallow ores were depleted.

- Pyrite veins in sericite phylite were mined on Pasour Mountain for their sulfur content during the Civil War and later until about 1902.

- Kyanite and aluminum silicate are found in significant amounts in quartzites on both the Kings Mountain Pinnacle and Crowders Mountain. It is unlikely, however, that these will be mined due to their location in the two most prominent topographic locations of the area.

Soil Types

The *Soil Survey of Gaston County* (1989) notes seven county areas characterized by a distinctive pattern of soils, relief, and drainage. Each of these areas is a unique natural landscape. The map in Figure 3 shows the locations of these areas in Gaston County and the information that follows provides details about each area. Each areas is named for its predominate soil types:

- Cecil-Pacolet
- Cecil-Urban land
- Tatum
- Gaston-Winnsboro-Cecil
- Appling-Wedowee-Pacolet
- Madison
- Chewacla-Congaree

Figure 3. Gaston County Soils Map.

Cecil-Pacolet Area

The following information describes important soil characteristics for this area of Gaston County.

Description	Gently sloping to steep, well-drained soil. Loamy surface layer with predominantly clay subsoil.
Formation	In residuum weathered from felsic igneous and metamorphic rock.
Location	28% of county, predominantly in the central and northwestern sections.
Soil Mix	About 50% Cecil soil, 25% Pacolet soil, and 25% other soils, including: ▪ Gaston, Madison and Wedowee (on ridges) ▪ Helena and Worsham (along and at the head of drainageways)
Use	Cecil used for cropland and pasture, Pacolet is mostly woodland.
Limitations	Erosion hazard, steepness of slope.

Cecil-Urban Land Area

The following information describes important soil characteristics for this area of Gaston County.

Description	Gently to strongly sloping, well drained soils and urban land. Loamy surface layer and predominantly clay subsoil.
Formation	In residuum weathered from felsic igneous and metamorphic rock.
Location	18% of county, predominantly in commercial, industrial and residential areas of Gastonia and other communities.
Soil Mix	About 38% Cecil soil, 32% urban land, and 32% other soils, including: ▪ Appling (southwest) ▪ Tatum (around Bessemer City) ▪ Gaston (around Belmont/Mount Holly) ▪ Helena and Worsham (along and at the head of drainageways).
Use	Primarily urban use.
Limitations	Erosion hazard, steepness of slope, surface runoff.

Tatum Area

The following information describes important soil characteristics for this area of Gaston County.

Description	Gently sloping to moderately steep, well-drained soil. Gravelly loam surface layer and predominantly clay subsoil.
Formation	In residuum weathered from sericite schist and phylite.
Location	16% of county, predominantly in southwest to west central portions of the county.
Soil Mix	About 89% Tatum soil and 11% other soils, including : ▪ Alamance, Variant and Gaston (on ridges and slopes) ▪ Lignum (along drainageways) ▪ Uwharrie (on Crowders Mountain and Kings Mountain Pinnacle)
Use	75% of this area is woodland. Remaining land is cropland, pasture and small areas of urban development.
Limitations	Erosion hazard, steepness of slope, moderate shrink-swell potential.

Gaston-Winnsboro-Cecil Area

The following information describes important soil characteristics for this area of Gaston County.

Description	Gently sloping to moderately steep, well-drained soil. Loamy surface layer and predominantly clay subsoil. Slope variations.
Formation	In residuum weathered from intermediate, mafic and felsic igneous and metamorphic rock.
Location	16% of county, predominantly in eastern portion, with two smaller areas in the west.
Soil Mix	About 70% Gaston soil, 9% Winnsboro, 8% Cecil and 13% other soils, including : ▪ Madison and Pacolet (on ridges and side slopes) ▪ Helena and Worsham (along and at the head of drainageways)
Use	Gaston and Cecil areas are predominantly cropland or pasture, remainder is woodland.
Limitations	Erosion hazard, steepness of slope. Gaston is limited by a moderate shrink-swell potential. Winnsboro is limited by a high shrink-swell potential and low permeability.

Appling-Wedowee-Pacolet Area

The following information describes important soil characteristics for this area of Gaston County.

Description	Gently sloping to steep, well-drained soil. Loamy surface layer and predominantly clay subsoil.
Formation	In residuum weathered from felsic igneous and metamorphic rock.
Location	8% of county, predominantly in northeastern and northwestern sections.
Soil Mix	About 47% Appling, 21% Wedowee, 20% Pacolet and 12% other soils, including : ▪ Cecil, Madison and Vance (on ridges and side slopes) ▪ Helena and Worsham (along and at the head of drainageways)
Use	Appling is predominantly cropland or pasture, Wedowee and Pacolet are predominantly woodland
Limitations	Erosion hazard, steepness of slope. Wedowee has moderate shrink-swell potential.

Madison Area

The following information describes important soil characteristics for this area of Gaston County.

Description	Gently sloping to steep, well-drained soil. Loamy surface layer and predominantly clay subsoil.
Formation	In residuum weathered from felsic micaceous metamorphic rock.
Location	7% of county, predominantly in northeastern, central and southwestern areas of county.
Soil Mix	About 75% Madison and 25% other soils, including : ▪ Cecil, Gaston, Pacolet and Wedowee (on ridges and side slopes) ▪ Helena and Worsham (along and at the head of drainageways)
Use	Predominantly woodland along strongly sloping and moderately steep areas. Cropland or pasture in more gently sloping areas.
Limitations	Erosion hazard, steepness of slope.

Chewacla-Congaree Area

The following information describes important soil characteristics for this area of Gaston County.

Description	Nearly level, somewhat poorly drained to well drained soil with a loamy surface layer and a loamy subsoil.
Formation	Formed in recent alluvium.
Location	7% of county, along floodplains of major streams. Areas are long and narrow and at the lowest elevations.
Soil Mix	About 70% Chewacla, 20% Congaree, and 10% other soils including Helena and Worsham (along and at the head of drainageways).
Use	Chewacla is predominantly woodland, Congaree is pasture or cropland.
Limitations	Wetness, flood hazard.

Land Use

As shown in Table 2, thirteen municipalities are located within Gaston County. A fourteenth city, Kings Mountain, is located primarily in adjoining Cleveland County but partly in Gaston. Gaston County ranks sixth of the state's 100 counties in population and population density.

Table 2. Gaston County Municipalities, Population Data (NC Office of State Planning).

Municipality	1990 Population	1999 Popopulation	% Change
Belmont	8,434	8,504	0.8
Bessemer City	4,698	5,011	6.7
Cherryville	4,756	5,472	6.7
Cramerton	2,317	2,573	8.5
Dallas	3,012	3,254	8.0
Gastonia	54,725	62,739	14,6
High Shoals	605	611	1.0
Kings Mountain* * in part	8,763	10,154	15.9
Lowell	2,710	2,594	-4.3
McAdenville	830	822	-1.0
Mount Holly	7,710	8,381	8.7
Ranlo	1,650	2,203	33.5
Spencer Mountain	135	130	-3.7
Stanley	2,897	3,244	12.0

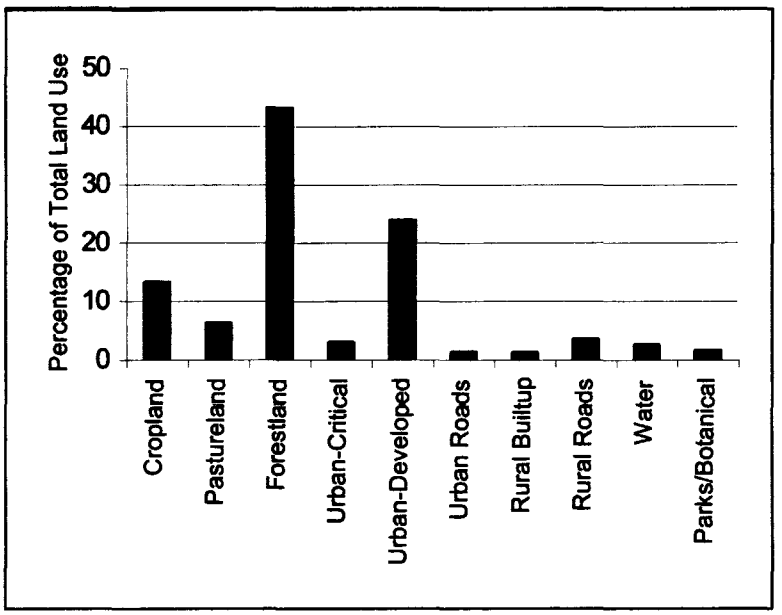
Approximately 68% of Gaston County's population lives in an urban setting and 0.4% on farms. Population growth projections are moderate due to the predominance of low growth industries, such as textiles. Gaston County's proximity to the Charlotte metropolitan area, however, and efforts to attract new industries and diversify the economic base, could increase population growth.

As illustrated in Figure 4, the predominant forms of land usage in Gaston County are forestland, urban development, and cropland.

The top three sources of income are manufacturing, wholesale/retail, and services. Gaston County's textile industry supplies almost 80% of the yarn used in the United States textile industry and employs more than 33% of the work force.

Agriculture continues to decline as the area becomes more urban. Farming is still important, but only 2% of the rural population is involved, with 65% of those individuals farming part-time and also working in local industries (Cope and Wellman, 1961). Today, Gaston County's most important crops are soybeans, corn, hay and grains. The most important livestock enterprises are dairy and beef cattle.

Figure 4. Land Uses in Gaston County as Percentage of Total Land Use.



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Chapter 2 – Natural Heritage Past and Present

Written by Dr. Jim Matthews, Habitat Assessment and Restoration Program (HARP) and Kimberley Lough, N.C. Cooperative Extension

About Natural Heritage Inventories

Natural areas are critical to environmental health and quality. They make for more attractive places to live and visit, they serve as reservoirs of biological diversity, and they are sanctuaries for native plants and animals whose survival may be in jeopardy.

A Natural Heritage Inventory is a systematic search for the best examples of natural habitats and locations, especially of rare and endangered biological species. Such an inventory usually results in reports and maps identifying and describing the most important of these natural areas.

History of the Gaston County Natural Heritage Inventory

The Natural Heritage Inventory in Gaston County is the culmination of many years of events in the county's understanding of its natural history. It is often said that seeds must be planted, but they germinate, grow, flower, and fruit when the environmental conditions are correct. This analogy seems to fit well with the development of interest in the natural heritage of the county.

The Schiele Museum

In 1950, Gaston residents R.M. (Bud) Schiele and his wife, Lily offered to donate their services and collections to Gaston County. A museum to house these collections was incorporated in 1961 as the Gaston Museum of Natural History. It has since grown into the city of Gastonia's Schiele Museum of Natural History. The mission of this museum is to provide natural and cultural exhibits, public and school programming, and planetarium programs, as well as to conduct field research and to maintain collections of natural specimens. This museum has successfully enriched the lives of many citizens of the area.

Crowders Mountain State Park

In 1970, the newly formed Gaston County Conservation Society, led by Richard Cone, sought to preserve Crowders Mountain as a state park. The group produced a slide show to document the importance of the area. Entitled *Crowders Mountain: Park or Pit,* it was effectively presented to the public and to state government. This effort resulted in the state's purchase of 1,902 acres in the area in 1972, and a subsequent purchase of 466 more acres.

Very recently, additional land has been acquired for the park, creating a corridor between Crowders Mountain State Park, Kings Mountain State Park and Kings Mountain National Military Park.

Crowders Mountain State Park is one of the most important natural areas in Gaston County. See Chapter 5 for more detailed information about this park.

Other Important Efforts

Other individuals recognized the importance of land preservation. In 1981, the Forney Rankin family initiated discussions with the University of North Carolina at Charlotte regarding their homesite, Redlair, and the potential preservation of this approximately 180-acre tract along the South Fork of the Catawba River. Nothing came of this initial effort, but the idea did not die. When the Catawba Land Conservancy (CLC) was founded in 1991, it acquired a conservation easement on 95 acres of the Rankin property in 1995, and added an additional 440 acres in 1996.

The Catawba Land Conservancy currently holds conservation easements on a total of 867 acres of land in Gaston County.

In 1997, Jim Green of the Schiele Museum of Natural History suggested the need for a survey of the Catawba River Basin. Although the project was not developed, probably due to the size of the area involved, this idea did not die either. In 1991, Dr. Richard Brown, then at UNCC, suggested that a study limited to Gaston County would be more feasible. In 1993, Jim Green circulated a proposal for a Natural Heritage Inventory of Gaston County. During this time, the N.C. Natural Heritage Program began sponsoring and encouraging county natural heritage inventories across the state.

The Daniel Jonathan Stowe Conservancy

Another factor that helped increase the natural heritage interest of the citizens of Gaston County was the formation in 1989, of the Daniel Jonathan Stowe Conservancy, Inc. In a 480-acre site on Lake Wylie, the Daniel Stowe Botanical Garden, which opened in 1991, preserves and perpetuates a nurturing environment for aesthetic enjoyment, horticultural excellence and educational opportunity. It provides both an outstanding resource for the public, and leadership in environmental concerns.

The Gaston Quality of Natural Resources Commission (QNRC)

In 1989, the Gaston County Commissioners formed a new group to examine the quality of life in the county. This group was named the Quality of Natural Resources Commission and is generally referred to as QNRC. The group is made up of more than 50 members representing municipalities, businesses, industry, environmental organizations, county boards and agencies, and citizens from across Gaston County. The mission of the QNRC is to examine the state of natural resources in Gaston County, review environmental concerns, facilitate educational programs, and make recommendations to the Board of County Commissioners on ways of improving the environment.

Some members of this group who were familiar with past efforts to conduct a natural heritage survey and felt it was time to examine the natural heritage of the entire county. One of the important driving forces was the need to know where the important natural areas of the county were, since the county was beginning to study its transportation needs. George Cobb, Transportation Planner for the City of Gastonia helped to spearhead this focus.

Initiation of the Gaston Natural Heritage Inventory Project

In 1994, as Mecklenburg County was in the final stages of its own Natural Heritage Survey process, Gaston undertook a similar project. On November 28, 1995, the Daniel Stowe Botanical Garden hosted a meeting of those interested in developing a Natural Heritage Survey of the county. Present were representatives from the following:

- Daniel Stowe Botanical Garden
- Schiele Museum of Natural History
- Catawba Lands Conservancy
- City of Gastonia and Gaston County Planning Departments
- Gaston Audubon Society
- Gaston College
- Crowders Mountain State Park
- Habitat Assessment and Restoration Program (HARP)
- N.C. Natural Heritage Program

Ms. Linda Pearsall, of the N.C. Natural Heritage Program described the state program and the funding and required reporting related to the program. At the consensus of the group, a second meeting was scheduled for January, 1996, at the Schiele Museum. A subsequent open forum of the same groups, but with several more community participants, led to a commitment for a Natural Heritage Survey project, using the guidelines of the state program.

Dr. Alan May, of the Schiele Museum was designated to coordinate the program. The N.C. Cooperative Extension office in Dallas, directed by Ms. Martha A. Burris, was designated to handle the financial arrangements. In 1996, an initial contract for the field work was signed with Dr. Jim Matthews and HARP. This contract was subsequently renewed through 1997, and during that time the field work was performed.

Inventory Survey Goals

The goals of the Gaston County Natural Heritage Inventory include the following.

- To identify and describe the most important county natural heritage sites.

- To provide information about these sites to the citizens of Gaston County, so that they might have a better understanding of their natural heritage.

- To assist in the preservation of important natural areas so that biological diversity is encouraged, and Gaston County is a better place to live, work, and visit.

Inventory Survey Organization and Process

Field work for the inventory was performed by teams of biologists from HARP and the Schiele Museum, and several volunteers. Dr. Jim Matthews of HARP directed the effort. Preparation of the final inventory report was a cooperative effort between biologists at HARP and QNRC.

Site Selection

A total of 111 Gaston County sites were examined during the field work. Citizen input was obtained by distributing Natural Heritage Inventory Reporting forms at the Schiele Museum and the Stowe Botanical Garden. Interested citizens used these forms to suggest potential areas to be included in the survey. The biological significance of a site was determined by the raw data from field surveys and the experience of professional biologists. The factors used to determine site significance included the following:

- Quality, condition, and size of the site
- Rarity of natural community types and rare species present
- Ecological integrity or long-term viability of the site

Other considerations included the overall floral and animal diversity, presence of species that are uncommon or that are ecological indicators of special habitats, potential animal habitat, and degree of connectivity with other natural areas. Each site was given a biological significance rating based on these factors.

Methodology

Each site was surveyed by a traverse that crossed those areas of the site that appeared to have potential for good habitats. The selection of those areas was based upon degree of slope, slope aspect, and cover. General conclusions as to where the most significant areas might be found were based on these mapped features. However, the final decisions were made in the field when cover type and integrity were apparent. The route of each site survey traverse, therefore, was based on field indicators and the experience of the surveyors.

Due to survey time constraints, no systematic grid patterns or random numbers site surveys were made. The survey goal was to identify as many as possible of the most ecologically significant natural areas within the county.

Inventory Survey Results

Biologically significant sites are rated at the following four levels. See Chapter 7 for a detailed definition of each level.

- National
- State
- Regional
- County

During the Gaston County Natural Heritage Inventory 111 sites were examined. Twelve of these were determined to have national, state or regional significance and 25 were ranked as significant at the county level. These sites were then designated as follows:

- Sites of national, state or regional significance (12 sites) were labeled as "A" sites.
- Sites of county level significance (25 sites) were labeled as "B" sites.
- Sites, not currently considered significant from a Natural Heritage perspective (74 sites) were labeled as "C" sites.

The types of vegetation and plant communities and animal wildlife habitats that were observed at the selected sites are described in Chapters 3 and 4 of this document. Specific information about each of the selected sites is included in Chapter 7.

The Concept of Natural Heritage

In the *Classification of the Natural Communities of North Carolina, Third Approximation*, Schafale and Weakley (1990) define a natural community type as "A distinct and reoccurring assemblage of populations of plants, animals, bacteria and fungi naturally associated with each other and their physical environment." Natural communities designated as heritage sites are not necessarily untouched by human activity. Human activity has affected every corner of Gaston County, both directly and indirectly. Because communities are dynamic systems and are always in different stages of recovery from both human and natural disturbances, even freedom from human disturbance does not necessarily indicate an area's natural condition,

Understanding of the complex relationships inherent in natural communities is necessary for a full understanding of the ecosystem process on which humanity depends. Natural communities have intrinsic value as natural systems and they have aesthetic value to human beings. Natural communities provide the following:

- Valuable scientific information about the complex interactions between organisms, and the ecosystem functions that arise from these interactions.
- A setting for valid experimental study of complex population interactions. Such complex interactions are much more difficult to study effectively in a laboratory setting.
- A way to protect both common organisms and those that are too little known to warrant or receive specific attention. This allows species-specific action to be focused on rare species that occur infrequently.

Planning for the best use of Gaston County's natural areas requires knowing what types of natural habitats exist and where they are located. A Natural Heritage Inventory helps to answer such questions and can guide resolution of conflicts over land use and

economic decisions. A Natural Heritage Inventory identifies important natural sites and communities, and attempts to document the following:

- Vegetation
- Animal wildlife
- Topography
- Substrate
- Hydrology
- Soil types and characteristics
- Other important data such as moisture regime, landforms, and natural disturbances

Protected, preserved, and restored areas become like a local bank, improving quality of life, supplying native plant habitats and wildlife refuges, providing fresh water storage and filtration, and serving many other necessary biological functions (Bridle, et. al., 1998).

Rare and Endangered Species Designations

Both the State of North Carolina and the United States Government provide legal protection for threatened and endangered plant and animal species. See Appendix 7 for specific information regarding criteria and status designations for such species.

Biological Surveys and Endangered Species Law

Biological surveys on privately-owned land require the permission of the landowner. Occasionally, permission to survey on private land is denied due to misconceptions. Some landowners fear that if a rare species is found, restrictions and land use limitations will be imposed. Such misconceptions can have an unfortunate impact for the following reasons:

- Owners of lands that are biologically significant may be eligible for available conservation program options and tax incentives.

- Landowners are given the results of biological surveys and, if the results show lands that are biologically significant, are put in touch with the appropriate conservation organizations.

- Witholding permission for study hinders research.

About Federal Endangered Species Law

The following facts apply to the Federal Endangered Species Act (ESA):

- ESA applies only to plants and animals on either the Federal Endangered Species List or the Federal Threatened Species List. Since federally listed species are very rare, the probability of their occurrence on private land is very low.

- ESA does protect species from potentially harmful actions of private landowners, but it also offers flexible tools for resolving conflicts.
- It is illegal to engage in trade in a federally listed plant or animal species without a permit.
- *Taking* (harassing, harming, pursuing, hunting, killing, or trapping) or illegally possessing listed animals is illegal.
- Removing, digging up, cutting, damaging, or destroying a listed plant on another person's land, in knowing violation of the law, is illegal.
- Private landowners can lawfully take listed species if this is *"Incidental to and not the purpose of carrying out otherwise lawful activities,"* and if the landowner implements a conservation plan for the species.
- Private developers can obtain permits to legally harm or even kill federally listed species on their property provided that they can document that attempts were made to minimize impacts on the species in other ways.
- The existence of a federally listed species on private property legally has no effect on the landowner unless a project requiring a federal permit is planned, or uses Federal funds, or will clearly result in the *taking* of a listed species.
- Regarding designation of critical habitat, which sometimes occurs for federallylisted species, private landowners are not regulated by the ESA. Only federal actions that would adversely alter critical habitat for listed species fall under the ESA.

About North Carolina Endangered Species Law

The following facts apply to North Carolina law:

- North Carolina endangered species laws apply to species listed by the state as endangered or threatened. These lists include federally listed species as well as species considered endangered, threatened, or of special concern in the state.
- The state endangered species laws are modeled after the ESA, in that trafficking or poaching of listed species is illegal.
- The N.C. law states that, *"No rule may be adopted that restricts use of development of private property."*
- The N.C. law specifically states that, *"The incidental disturbance of protected plants during agricultural, forestry, or development operations is not illegal so long as plants are not collected for sale or commercial use."*

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Chapter 3 – Plant Communities of Gaston County

Written by Dr. Jim Matthews, HARP

Introduction

The earliest known botanical explorations of Gaston County were those of André Michaux in 1789 and 1795. He followed one of the primary routes north from Charleston, S.C. to the mountains, going along the west side of the Catawba River, crossing at Land's Ford in S.C. and crossing into Gaston County at Armstrong Ford on the South Fork of the Catawba, before moving on to Lincoln County.

Two other east-west routes crossed into Gaston County from Mecklenburg County. One crossed at Tuckaseegee Ford and the other at Beattie's Ford. Both connected to the main road to Lincolnton.

In 1839, M.A. Curtis from the University of North Carolina at Chapel Hill, made a trip to the mountains, crossing the Catawba at Beattie's Ford (Matthews, et al., 1997). In 1901, a biologist name J.K. Small reported on his studies of the summit flora of Kings and Crowders Mountains. An interesting analysis of some early botanical history of the area is found in a paper by Charlie Williams entitled, *André Michaux and the Discovery of Magnolia macrophylla in North Carolina.*

In spite of this early work, no concentrated effort was made to document the plant species of Gaston County. The best documentation was developed in the 1950s, during research for the *Manual of the Vascular Flora of the Carolinas* (Radford, et al., 1968), which was being developed at the University of North Carolina at Chapel Hill.

Dr. Tom Daggy of Davidson College made collections, particularly along the Catawba River Valley from 1947 until the 1970s. His collections are now included in the herbarium at the University of North Carolina at Charlotte.

The flora of Crowders Mountain State Park has been studied more intensively than that in other areas of the county, where many interesting discoveries have been made only as a result of environmental analyses for potential development.

The Natural Heritage Inventory has been the only organized effort to examine the flora of the entire county. As a result of this work, the local flora is much better understood now than ever before. Unfortunately, in this period of urbanization, many sites are being lost.

Methodology

To provide a systematic method of inventory for this survey, the field work was developed and conducted using a series of 7.5 minute topographic maps from the *U.S. Geological Survey* (USGS). These maps, which covered the entire county, were pieced together, mounted on foam core and covered with plastic sheeting. The foam core was cut and reinforced so it could be folded and placed in a vehicle. This compilation map became the focus for group presentations and helped to conduct the field work in a systematic manner. As the work was planned, the map was marked with wax pencils to delineate the sites on the plastic cover, permitting an overall view of the county.

The county was divided into four areas with two major highways (Interstate 85 and U.S. 321) forming the boundaries of the northeast, southeast, northwest and southwest quadrants (Figure 5). Due to the differences throughout the county in topography, amount of open space, and apparent development pressure, each quadrant was examined separately.

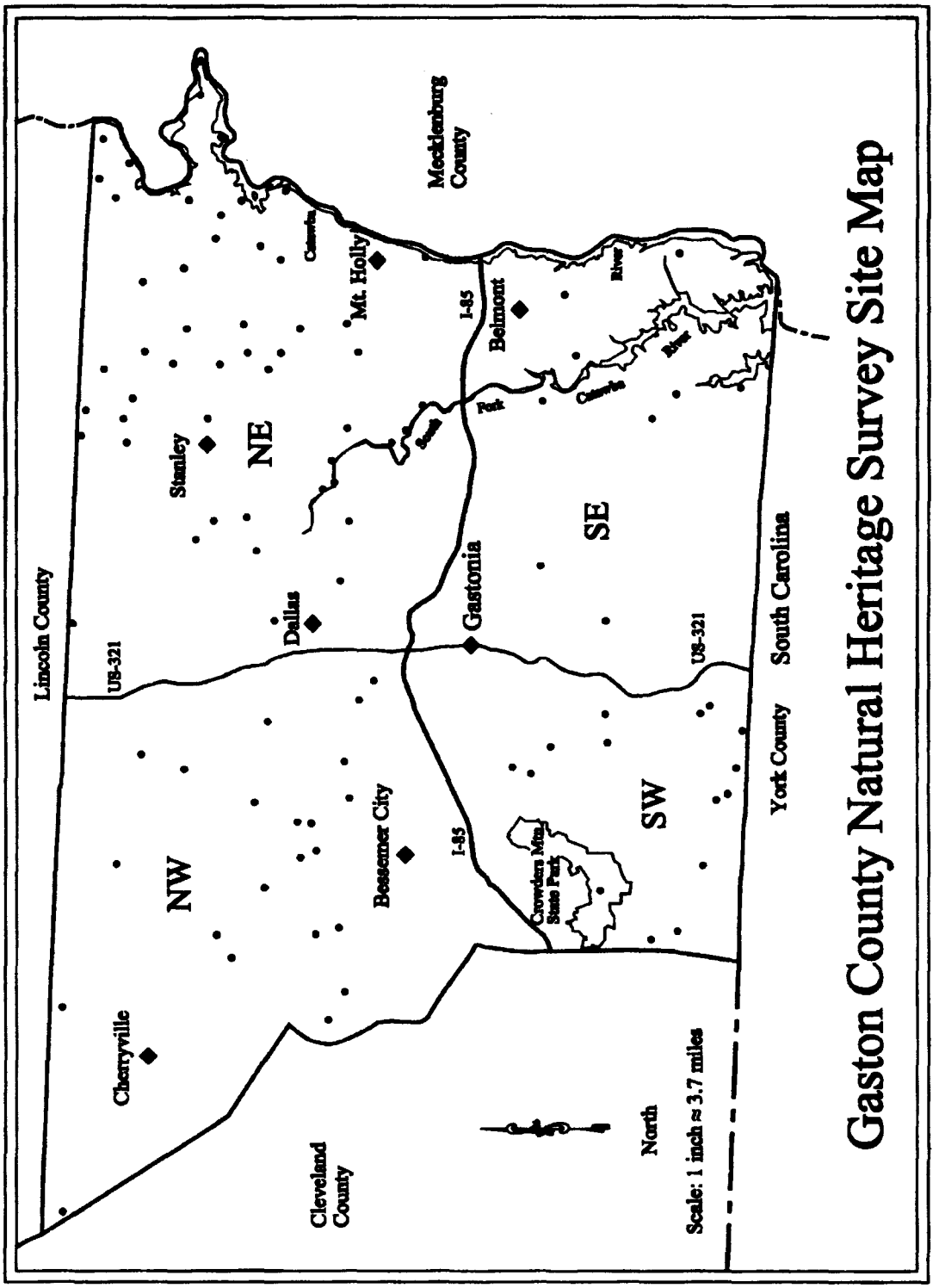
Response to initial attempts to obtain owner permission for site visits was disappointing. Initially, landowners were identified using the County Tax Office, and letters requesting permission to visit sites were sent from the N.C. Cooperative Extension office. This met with some disappointing results, so another approach was adopted. This time, a local representative from the Schiele Museum or N.C. Cooperative Extension contacted landowners by phone, or accompanied the field workers to ask permission at the time of the visit. This process was more successful. Most landowners were quick to cooperate, and good relationships were established. In some instances when no ownership could be established, visits were made without permission. No problems resulted.

Sites were selected and surveyed based on knowledge of the area flora, topography and aspect, soil series, geology and amount of development. This combination of factors resulted in the selection of several north-facing, steep slopes associated with flood plains, since these tend to be the least disturbed and have the best vegetative cover.

Almost all uplands have been timbered or used for agriculture, except for the poorest soil areas. Therefore, the entire county can be considered as second-growth forest. Some areas have older second growth and have retained or reestablished the composition of species that reflect a good quality plant community. Priority was placed on finding the largest, oldest and best potential sites. Geology and soils maps were used in conjunction with the topographic maps. If a drive-by observation showed a potential site to be developed, it was eliminated from the list.

More sites were examined in the northeast area than in the other three areas due to the known presence of populations of *Magnolia macrophylla*, the well-developed drainage systems of Dutchmans Creek and the South Fork River, and the comparative lack of development. Primarily due to the amount of development, fewer sites were located in the southeast, although there are two important drainage systems in the area. The northwest portion of the county has the highest amount of disturbance from agriculture, due to the soil and topography. Fewer sites exist the closer one gets to Cherryville.

Figure 5. The Distribution of Natural Heritage Survey Sites.



The area north of Bessemer City, however, provided some good field data. Here, many abandoned agricultural areas have become timber sites.

The southwest quadrant is dominated by Crowders Mountain State Park and extensive development along US 321 south. In addition to the park, there are several sites associated with the large private land holdings present in this area of the county.

Field work was begun in the spring of 1996 and continued through the fall of 1997. Irregular field work continues today and inventory updates continue up to the present. The computerized database developed as part of the inventory process allows instant update as changes occur.

A total of 111 sites were examined in the process of the field work. Some important sites probably exist that are unknown at the time of this writing, and some of these sites may be lost to development. Since the majority of the Catawba River corridor is or was owned by Duke Power/Crescent Resources, much of that area has been timbered. However some slopes and bottomlands have been preserved. Gaston County has acquired much of the Mountain Island Lake property along the Catawba River for watershed protection. The intensity of development is not as great as in the remainder of the county and given time, some of the vegetation will possibly return to the more climax situation.

The primary botanical reference for this report is the *Manual of the Vascular Flora of the Carolinas* (Radford et al.). However, since that book was compiled in 1968, many new species have been reported and there have been numerous nomenclatural and taxonomic changes. Inconsistencies in distributions and in nomenclature occur depending on which source one uses. In some instances, the common name can assist in determining the correct scientific name. Often there is no common name, and the scientific name becomes the common name.

For plant names that have changed since Radford, the name as documented by Radford is listed first, followed by the currently-accepted name in brackets. To allow more non-scientific use of this document, the common name, if available, is shown in parentheses after the scientific name. The more common plant species were not documented. However, important species, characteristic of each site, were documented and collected. Plant specimens are maintained in the herbarium at the University of North Carolina at Charlotte.

Types of Plant Communities

The following information describes plant communities identified in Gaston County during the inventory process. These descriptions are based on information in the *Classification of the Natural Communities of North Carolina, Third Approximation* (Schafale and Weakley, 1990). They have been tailored for Gaston County, in that species that may occur in these types of communities in other parts of the state are omitted.

The following general types of information are provided for each forest community. Slightly different categories of information are included for other types of communities, such as rock outcrops and some lowland areas.

- General description
- Gaston County locations
- Trees in the canopy layer
- Understory trees
- Shrubs
- Herbs
- Rare plant species
- Disturbances
- Other information

Basic Mesic Forest

This type of community occurs in areas with basic substrates (pH above 7). In the Piedmont, this usually occurs on lower slopes, north-facing slopes and occasionally on well-drained small stream bottoms with basic or circumneutral soils. This type of community is similar to the Mesic Mixed Hardwood Forest.

These areas often have great species richness, but they are rare in the Piedmont, because of the limited extent of basic rock substrate in the area. When they do occur, particularly on steep slopes, they are often preserved and provide the habitat for rare or disjunct (isolated) species.

Although basic soils and indicator vegetation are generally associated with mafic rocks, occasional examples occur on apparently acidic soils. Soils on lower slopes, even on acidic rocks, usually have a higher pH than those on upper slopes and ridgetops. This difference probably is caused by the accumulation of leached bases from higher elevations, and makes distinctions between the effect of moisture status and nutrient status more difficult.

Basic substrates appear to allow lower slope and bottomland species to occur further upslope, in apparently drier sites. Thus, a Basic Mesic Forest community may extend further upslope than its acidic equivalent, a Mesic Mixed Hardwood forest. Soils in this type of community include Tatum and Wilkes.

Gaston County locations for Basic Mesic Forest communities are:

- Twin Brooks-Stanley Basic Forest (in part)
- Kenneth Oates Farm Forest
- Penegar Gastonia South (in part)

Because the overall moisture level is not easy to determine, Upland Hardwood Forests are most easily distinguished by the trees that make up the canopy. Basic Mesic Forests are dominated by the following mesophytic trees:

- *Liriodendron tulipifera* (Yellow poplar)
- *Fagus grandifolia* (Am. beech)
- *Acer saccharum* ssp. *floridanum* [*floridanum*](Southern sugar maple)
- Quercus rubra (Red oak).
- Possibly *Quercus shumardii* (Swamp red oak), *Juglans nigra* (Black walnut) and *Celtis laevigata* (Hackberry), although these are most typical of better-drained bottom land

Understory trees include *Cercis canadensis* (Redbud), *Cornus florida* (Flowering dogwood), *Ostrya virginiana* (Hop hornbeam), *Carpinus caroliniana* (Ironwood), *Asimina triloba* (Pawpaw) and *Ulmus rubra* (Slippery elm).

Shrubs may include *Viburnum* spp. (Haw), *Euonymus americanus* (Strawberry bush), *Lindera benzoin* (Spicebush), *Styrax grandifolia* (Storax), *Hydrangea arborescens*, *Staphylea trifolia* (Bladdernut), *Calycanthus floridus* (Sweet-shrub) and *Aesculus sylvatica* (Buckeye).

The herb layer generally is dense to very diverse, with *Polystichum acrostichoides* (Christmas fern), *Asarum canadense* (Wild ginger), *Menispermum canadense* (Moonseed), *Hepatica americana* (Liverleaf), *Sanguinaria canadensis* (Bloodroot), *Cimicifuga racemosa* (Black cohosh), *Cypripedium calceolus* [*pubescens*] (Yellow lady's slipper), *Panax quinquefolium* (Ginseng), *Adiantum pedatum* (Maidenhair fern), *Podophyllum peltatum* (Mayapple), *Tiarella cordifolia* var. *collina* (Alumroot), *Viola* spp. (Violet), *Hybanthus concolor* (Green violet), *Delphinium tricorne* (Larkspur), *Trillium cuneatum* (Little sweet betsy) and *Corydalis flavula.*

Under natural conditions these forests are uneven-aged, with old trees present. Reproduction occurs primarily in canopy gaps. Severe natural disturbances allow pulses of increased regeneration. Disturbed areas have increased amounts of pines and weedy hardwoods, such as *Liriodendron tulilpifera* (Yellow poplar) and *Liquidambar styraciflua* (Sweetgum), often with an invasion of exotic species such as *Lonicera japonica* (Japanese honeysuckle).

Basic Mesic Forests, with a higher pH, show more diversity in the herbaceous species present compared to the Mesic Mixed Hardwood forest. Some species that can serve as an indicator of the basic substrate include *Hybanthus concolor, Delphinium tricorne, Trillium cuneatum, Asimina triloba, Lindera benzoin, Staphylea trifolia* and *Corydalis flavula.*

Rare plant species include *Aster commixtus* [*mirabilis*] (Piedmont aster), *Cardamine angustata* var. *multifida* [*dissecta*](Dissected toothwort), *Corallorhiza wisteriana* (Spring coral-root), *Delphinium exaltatum* (Tall larkspur), *Dirca palustris* (Leatherwood),

Euonymus atropurpurea (Strawberry bush), *Heuchera caroliniana* (Carolina alumroot), *Hybanthus concolor* (Green violet), Philadelphus *inodorus* (Mock orange), *Gillenia* [*Porteranthus*] *stipualta* (Indian physic), *Ptelea trifoliata* (Wafer ash) and *Quercus muehlenbergii* (Yellow chestnut oak).

Chestnut-Oak Forest

Although they are common in the Blue Ridge region, Chestnut Oak Forests are relatively rare in the Piedmont. They occur on slopes and ridgetops. Although they were once dominated by American chestnut trees, today they are characterized by the dominance of *Quercus prinus* [*montana*] (Chestnut oak).

These communities are distinguished from Granitic Dome and Rocky Summit communities by having a potentially closed or nearly closed canopy and having little exposed rock. They are distinguished from the Pine-Oak/Heath community by a lack of substantial numbers of pines, closed or nearly closed canopy, and a less dense shrub layer. However, where American chestnut trees were once abundant, their death may have left an open canopy and allowed a dense heath layer to develop.

The soils are generally dry, upland types, which in Gaston County are classified as Pacolet. Gaston County locations with Chestnut Oak Forest communites include the following:

- Spencer Mountain Dam (in part)
- South Pasour Mountain (in part)
- Middle Pasour Mountain (in part)
- Mike Moore Hill (in part)
- Ferguson's Knob (in part)

Besides the Chestnut oak, canopy species include *Quercus rubra* (Red oak), *Quercus alba* (White oak), *Quercus stellata* (Post oak), *Nyssa sylvatica* (Black gum), *Pinus strobus* (White pine), *P. echinata* (Shortleaf pine), *Liquidambar styraciflua* (Sweetgum) and *Liriodendron tulipifera* (Yellow poplar).

The understory includes *Oxydendrum arboreum* (Sourwood), *Acer rubrum* (Red maple), *Cornus florida* (Flowering dogwood), *Magnolia macrophylla* (Big-leaf magnolia), *Tilia heterophylla* (Basswood) and various *Carya* spp. (Hickory). In the more mesic areas at the base of the slope, *Carpinus caroliniana* (Ironwood) and *Aesculus sylvatica* (Horse chestnut) occur. Stump sprouts of *Castanea dentata* (American chestnut) are abundant on the slopes.

Shrubs include *Kalmia latifolia* (Mountain laurel), *Rhododendron nudiflorum* [*periclymenoides*] (Wild azalea), *Corylus cornuta* (Beaked hazelnut), *C. americana* (American hazelnut), *Chionanthus virginicus* (Fringe tree), *Cercis canadensis* (Redbud), *Sassafras albidum* (Sassafras), *Castanea pumila* (Chinquapin), *Vaccinium stamineum* (Gooseberry) and *Hamemelis virginiana* (Witchazel). Along the base of the slope, in the

more mesic area, *Halesia carolina* (Silverbell), *Sambucus canadensis* (Elderberry) and *Asimina triloba* (Pawpaw) might be found.

The herbs are very diverse with the dry and mesic habitats. These include *Chimaphila maculata* (Spotted wintergreen), *Trillium catesbaei* (Wake robin), *Goodyera pubescens* (Rattlesnake plantain), *Iris cristata* (Crested iris), *Cimicifuga racemosa* (Black cohosh), *Polygonatum biflorum* (Solomon's seal), *Aruncus dioicus* (Goat's-beard), *Antennaria solitaria* (Pussy-toes), *Sanguinaria canadensis* (Bloodroot), *Amianthium mucaetoxicum* (Fly-poison), *Mitchella repens* (Partridge berry), *Aureolaria* spp. (Aureolaria) and *Hepatica americana* (Hepatica). With the varying habitats, seven species of ferns are present, including *Polystichum acrostichoides* (Christmas fern), *Thelypteris noveboracensis* (New York fern), *Thelpyteris hexagonoptera* (Broad-Beech fern), *Adiantum pedatum* (Maidenhair fern), *Athyrium asplenioides* (Southern lady fern), *Asplenium platyneuron* (Ebony spleenwort fern) and *Botrychium virginianum* (Rattlesnake fern).

The Chestnut Oak Forest is often exposed to a variety of natural disturbances such as fire, winds and ice storms and in some cases clear-cutting. Gaps left by the death of the American chestnuts have been filled by species of disturbance, such as Yellow poplar, Red maple and various pines.

Rare plants that often inhabit Chestnut Oak Forests include *Fothergilla major* (Witch-alder) and *Thermopsis mollis* var. *mollis.*

Dry Oak-Hickory Forest

This forest type was once one of the predominant community types in the Piedmont. Most land of this type in Gaston County is now either in agriculture, under urban development or is occupied by successional pine stands after past agriculture. What was not cleared was subject to long-term selective cutting and livestock foraging.

This forest occurs on ridgetops, upper slopes, on steep south-facing slopes and in other relatively dry upland areas on acidic soils. A variety of upland soils are found here, including Cecil, Georgeville, Goldston and Pacolet.

Dry Oak-Hickory Forest occurs in the following Gaston sites:

- Crowders Mountain State Park (in part)
- Forney Rankin/Redlair Preserve (in part)

This type of forest is dominated by dry site oaks like *Quercus alba* (White oak), *Q. falcata* (Southern red oak) or *Q. stellata* (Post oak), along with other various oak and hickory species such as *Q. marilandica* (Black jack oak), *Q. velutina* (Black oak), *Q. coccinea* (Scarlet oak), *Carya tomentosa* [*alba*] (Mockernut hickory), *C. ovalis* (Sweet pignut hickory) and *C. glabra* (Pignut hickory). Pines often are an important component and occasionally may even be dominant.

Typical understory trees include *Oxydendrum arboreum* (Sourwood), *Acer rubrum* (Red maple), *Nyssa sylvatica* (Black gum), *Cornus florida* (Flowering dogwood) and *Vaccinium arboreum* (Sparkleberry).

The shrub layer varies from sparse to dense, with ericaceous (heath) shrubs constituting most of the species. Herbs generally are sparse.

Disturbed areas have more pines and weedy hardwoods, such as *Acer rubrum* and *Liquidambar styraciflua* (Sweetgum). Amounts depend on the degree of canopy opening. Areas that were cultivated generally are dominated by even-aged pine stands, which may be replaced by the climax oak hickory community as the pines die. Heavily logged areas may have a mixture of hardwoods and pines. Under natural conditions these forests are uneven-aged, with old trees present. Reproduction occurs primarily in the canopy gaps.

Rare plants that may occur in this community are: *Amorpha schwerinii* (Piedmont indigo bush), *Corallorhiza wisteriana* (Spring coralroot), *Nestronia umbellula* (Nestronia), *Onosmodium virginianum* (Virginia marbleseed), *Gillenia* [*Porteranthus*] *stipulata* (Indian physic), *Prunus umbellata* (Hog plum), *Rhus michauxii* (Michaux's sumac), *Thermopsis mollis* var. *mollis* (Appalachian golden-banner) and *Yucca filamentosa* var. *smalliana* [*flaccida*] (Weakleaf yucca).

Dry-Mesic Oak-Hickory Forest

This type of forest was also once a predominant natural community in the Piedmont. Most of this area is now in agriculture, in urban development, or is occupied by successional pine stands after past agriculture. This type of community is still relatively common in Gaston County compared to other types, but examples of significant size and good quality are rare. Most are located on dissected lands near rivers or creeks, mid slopes, low ridges, and upland flats on acidic soils.

This forest type usually occurs on the topographic moisture gradient between the Dry-Oak Hickory Forest and the Mesic Hardwoods. These communities are generally located in Cecil, Pacolet, or Georgeville soils. Dry-Mesic Oak Hickory Forest communities are found in the following Gaston County locations:

- Crowders Mountain State Park (in part)
- Richard Rankin Complex (in part)
- Sumner Road (in part)
- Rhyne Bluffs (in part)
- Grant Hill (in part)
- Kenneth Oates Farm Forest
- Jack Moore Forest (in part)
- Laurel Hill Nursery Forest (in part)
- Riverbend Peninsula Forest (in part)
- Stanley Creek (in part)
- Spencer Mountain Dam (in part)

- Unity Church Road (in part)
- Forney Rankin Redlair Preserve (in part)

The canopy of a Dry-Mesic Oak-Hickory Forest is dominated by mixtures of oaks and hickories, with Quercus *alba* (White oak) being most prevalent, along with *Q. rubra* (Red oak), *Q. velutina* (Black oak), *Carya tomentosa* [*alba*] (Mockernut hickory), *C. ovalis* (Sweet pignut hickory) and *C. glabra* (Pignut hickory). Other common trees include *Pinus* spp. (various pines), *Liriodendron tulipifera* (Yellow poplar, and *Liquidambar styraciflua* (Sweetgum).

Understory species include *Acer rubrum* (Red maple), *Cornus florida* (Flowering dogwood), *Oxydendrum arboreum* (Sourwood), *Ilex opaca* (American holly) and *Nyssa sylvatica* (Black gum). Shrubs include *Vaccinium stamineum* (Gooseberry), *V. vacillans* [*pallidum*] (Blueberry), and *Euonymous americanus* (Strawberry bush). Herbs generally are sparse.

Disturbed areas have more pines and weedy hardwoods, such as *Acer rubrum* and *Liquidambar styraciflua.* Amounts depend on the degree of canopy opening. Areas that were cultivated are generally dominated by even-aged pine stands and replaced by the climax oak hickory community as the pines die. Under natural conditions, these forests are uneven-aged with old trees present. Reproduction occurs primarily in canopy gaps.

Rare plants that may occur in this community are: *Amorpha schwerinii* (Piedmont indigo-bush, *Nestronia umbellula* (Nestronia), *Gillenia* [*Porteranthus*] *stipulata* (Indian physic) and *Smilax ecirrhata* var. *biltmoreana* [*biltmoreana*] (Biltmore carrion-flower).

Granitic Flatrock

Outcrops occur when surfaces are exposed at about the same elevation as the surrounding land. They may be composed of granite, syenite or related rock. Soils may be bare rock, bare rock with shallow mats of mineral or organic matter, shallow rock, or sandy soils. Most of the area is xeric, but depressions in the rock may hold water in the winter. Seepage zones often occur at the forest edge or in cracks in the rock, providing water over the surface of the rock.

Vegetation may occur on open rock surfaces as patches of lichens or mosses. Vascular plants are limited to soil pits, with the depth of the soil controlling the species. Generally, the transitional soil depths for different species are 2-6 cm, 7-15 cm, 16-39 cm and above 40 cm. The greater the soil depth, the more diverse and larger in size the inhabiting flora will be. Such communities occur in the following Gaston County locations:

- Stagecoach Road Granitic Outcrop (in part)
- Thornburg Shoals (in part)

About fifteen plant species are endemic to flatrock communities in the Piedmont. These plants occur only in this type of habitat. Examples include *Diamorpha* (*Sedum*) *smallii*

(Small's sedum), *Sedum pusillum* (Puck's orpine), *Minuartia* (*Arenaria*) *uniflora* (Single-flowered sandwort) and *M.* (*A.*) *glabra* (Smooth sandwort), *Talinum teretifolium* (Fame flower), *Portulaca smallii* (Small's portulaca) and *Cyperus granitophilus* (Granite loving sedge).

Other, nonendemic species (occurring both in this habitat and in other types of habitats) that occur in these soil pits are *Manfreda* (*Agave*) *virginica* (Agave), *Senecio tomentosus* (Hairy ragwort), *Hypericum gentianoides* (Pineweed), *Andropogon* spp (Broomsedge), *Crotonopsis elliptica,* and *Diodia teres*. Woody species include *Chionanthus virginicus* (Fringe tree), *Rhus copallina* (Winged sumac), *Ulmus alata* (Winged elm), *Juniperus virginiana* (Red cedar) and various *Pinus* spp. (Virginia and Shortleaf pine).

Frequently a forest on shallow soil surrounds the outcrop. These are dominated by *Pinus virginiana* (Virginia pine), *P. echinata* (Shortleaf pine), *Quercus stellata* (Post oak), *Q. marilandica* (Black jack oak), *Q. coccinea* (Scarlet oak), *Q. prinus* (Rock chestnut oak), *Carya glabra* (Pignut hickory) and *C. tomentosa* (Mockernut hickory). These adjacent forests usually grade into Dry Oak-Hickory or Dry-Mesic Oak-Hickory Forest communities.

Low Elevation Rocky Summit

In the Piedmont, these habitats are usually small, and occur as rugged, horizontal to vertical rock outcrop areas on low elevation ridges. The soils primarily are small accumulations of mineral or organic soil in pockets and crevices, interspersed with bare rock. Soil series generally are not mapped and have received little scientific study or classification effort since they lack agricultural or development potential. The hydrology primarily is xeric due to lack of soil and exposure to wind. Deep crevices and seepage zones may retain more moisture, and depressions may hold water for short periods after rains.

This type of habitat occurs in the following Gaston County locations:

- Crowders Mountain State Park (in part)
- Pinnacle Road (in part)

The dominant species generally are a heterogeneous mix of individuals occurring in distinct microsites, often in crevices. Typical species include *Pinus virginiana* (Field pine), *P. pungens* (Table Mt. pine), *Quercus prinus* [*montana*] (Rock chestnut oak), *Tsuga caroliniana* (Carolina hemlock), *Q. ilicifolia* (Bear oak), *Kalmia latifolia* (Mountain laurel), *Rhododendron maximum* (Rosebay), *Gaylussacia bacata* (Black huckleberry) and *Vaccinium vacillans* [*pallidum*] (Blueberry).

Herbaceous species include *Polypodium virginianum* (Rock cap fern), *Danthonia spicata* (Oat grass), *Andropogon* [*Schizachyrium*] *scoparium* (Little bluestem) and *Asplenium montanum* (Mountain spleenwort).

These areas generally are in early stages of primary succession, which is slowed by resistant rock and harsh environment. Without disturbance, rock weathering and soil accumulation theoretically can allow development of a Pine-Oak/Heath community in these areas, but most rocky summits are stable over long periods of time.

Rare plant species include: *Asplenium bradleyi* (Bradley's spleenwort), *Juniperus communis* var. *depressa* (Ground juniper), *Xerophyllum asphodeloides* (Turkey-beard).

Low Elevation Seep

These communities exist in the Piedmont in seepage areas and springs at the bases of slopes and in interfaces between floodplains and upland communities. They typically grade into Bottomland Forests or into slope forests such as Mesic Mixed Hardwood Forests. These communities tend to be small and are often shaded by the canopy of adjacent communities.

The soil is usually quite mucky and permanently saturated. Examples of this type of community are found in the following Gaston County locations:

- Stagecoach Road Granitic Outcrop (in part)
- Unity Church Road (in part)

Occasional wetland trees, such as *Quercus phellos* (Willow oak) and *Acer rubrum* (Red maple), grow in the wet area. The most common identifier, however, is the assemblage of herbs, including *Saururus cernuus* (Lizard's Tail), *Impatiens capensis* (Touch-me-not), *Osmunda cinnamomea* (Cinnamon fern), *Osmunda regalis* var. *spectabilis* (Royal fern), *Boehmeria cylindrica* (False nettle), *Rudbeckia laciniata* (Coneflower), *Ranunculus recurvatus* (Buttercup), *Chelone glabra* (Turtlehead), *Sagittaria* spp. (Arrowhead), *Peltandra virginica* (Arrow arum) and *Juncus* spp. (Rush).

Although these areas are relatively stable over long periods, they respond drastically to changes in groundwater levels, particularly drought or draining.

Rare plant species are not common, although it is interesting to identify the elusive *Isoetes* spp. (Quillwort), which looks like a grass.

Mesic Mixed Hardwood Forest

While not as extensive as the Oak-Hickory Forests, Mesic Mixed Hardwood Forests are quite common in this area. Their occurrence on steep sites has allowed many of them to escape with fewer disturbances, although this is changing with increased developmental pressures on all types of topography. Some examples with old forest can be found. Mesic Mixed Hardwood Forests may be distinguished from Basic Mesic Forests by more acidic soils, sparser herb layer and lower floral diversity.

Mesic Mixed Hardwood Forests usually occur on lower slopes, steep north-facing slopes, ravines and occasionally well-drained small stream bottoms, on acidic soils. The soil types include Cecil, Georgeville and Pacolet.

Examples of these forests are found in the following Gaston County locations:

- Crowders Mountain State Park (in part)
- Rhyne Bluffs (in part)
- Armstrong Ford
- Jean Rankin Forest (in part)
- Grant Hill (in part)
- Kenneth Oates Farm Forest (B)
- Jack Moore (in part)
- Falston Road Forest
- Laurel Hill Nursery Forest (in part)
- Riverbend Peninsula Forest (in part)
- Saddler Road
- Airport Road East
- Rhyne Farm
- Mauney Creek
- Ferguson Ridge Road (in part)
- Forney Rankin/Redlair Preserve (in part)

Because overall moisture level is not easy to determine, upland hardwood forests are most easily distinguished by the canopy composition. Mesic Mixed Hardwood forests are dominated by *Fagus grandifolia* (Am. beech), *Quercus rubra* (Red oak), *Liriodendron tulipifera* (Yellow poplar), *Acer rubrum* (Red maple), and *A. saccharum* ssp. *floridanum* [*floridanum*] (Southern Sugar maple). Oaks, other than *Q. rubra*, generally are not important.

Typical understory trees include *Cornus florida* (Flowering dogwood), *Ostrya virginiana* (Hop hornbeam), *Acer rubrum* and *Ilex opaca* (Am. holly).

Shrub species may include *Vaccinium stamineum* (Squaw-huckleberry), *Viburnum rafinesquianum* (Haw), *Euonymus americanus* (Strawberry Bush) and sometimes *Kalmia latifolia* (Mountain laurel).

The herb layer often is moderately dense and diverse, though it may be sparse under heavy shade. Herb species may include *Polystichum acrostichoides* (Christmas fern), *Viola* spp. (Violet), *Galium circaezans* (Bedstraw), *Hexastylis arifolia* (Wild Ginger), *H. minor* (Wild Ginger), *Desmodium nudiflorum* (Beggar Lice), *Erythronium americanum* [*umbilicatum*] (Trout lily), *Hepatica americana* (Liverleaf), *Chamaelirium lutem* (Blazing-star), *Epifagus virginiana* (Squaw-root), *Tiarella cordifolia* var. *collina* (Foamflower), *Heuchera americana* (Alumroot), *Stellaria pubera* (Giant Chickweed), *Podophyllum peltatum* (Mayapple), *Prenanthes serpentaria* (Lion's Foot), and *Botrychium virginianum* (Rattlesnake fern).

Under natural conditions, these forests are uneven-aged with old trees present. Reproduction primarily occurs in canopy gaps. Severe natural disturbances may allow pulses of increased regeneration. Disturbed areas have increased numbers of pines and weedy hardwoods such as *Liriodendron tulipifera* and *Liquidambar styraciflua* (Sweetgum). Many areas have been selectively cut and have increased dominance of *Fagus grandifolia* and other noncommercial hardwoods. See the herbaceous species list of the Basic Mesic Forest for a list of more base-loving species.

Rare plants in these areas include *Aster commixtus* [*mirabilis*] (Piedmont aster), *Corollorhiza wisteriana* (Spring Coral-root), *Euonymus atropurpurea* (Strawberry Bush), *Galium uniflorum* (Bedstraw), *Panax quinquefolium* (Ginseng), *P. trifolium* (Dwarf ginseng) and *Phacelia ranunculacea.*

Piedmont Alluvial Forest

Piedmont Alluvial forests are distinguished from communities of larger floodplains partly for convenience, but mainly because of differences in the ecosystems. In smaller floodplains, the relief and size of the landforms, which differentiate the communities in large floodplains, become smaller. If the watershed is smaller, the flooding regime also will be more variable.

Alluvial Forest communities can, in some sense, be regarded as simply fine-scale mosaics of Levee, Swamp and Bottomland communities. Because of the smaller size of the Alluvial Forest communities, however, the levees, sloughs and ridges present in Levee, Swamp and Bottomland forests are absent or poorly developed. Variation probably is most related to frequency and recentness of destructive flooding.

Sites may vary due to different alluvial materials and their effect on soil fertility. Almost all alluvial sites, however, are more fertile than surrounding uplands. Soils may be especially rich if adjacent uplands are on a mafic rock substrate. Soils are various alluvial types which are seasonally or intermittently flooded.

These forests are found in the following Gaston County locations:

- Richard Rankin Complex (in part)
- Armstrong Road (in part)
- Sumner Road (in part)
- Jean Rankin Forest (in part)
- Rhyne Bluffs (in part)
- Jack Moore Forest (in part)
- Long Creek Gauging Station
- Ferguson's Knob (in part)

The canopy is a mixture of bottomland and mesophytic trees including *Betula nigra* (River birch), *Platanus occidentalis* (Sycamore), *Liquidambar styraciflua* (Sweetgum),

Liriodendron tulipifera (Yellow poplar), *Ulmus americana* (American elm), *Celtis laevigata* (Hackberry), *Juglans nigra* (Black walnut), *Fraxinus pennsylvanica* (Green ash), *Carya cordiformis* (Bitternut hickory), *C. ovata* (Shagbark hickory) and *Acer rubrum* (Red maple).

The type of forest has an open to dense understory or shrub layer and a sparse to dense herb layer. Understory trees include *Acer negundo* (Box elder), *A.saccharum* ssp. *floridanum* [*floridanum*](Southern Sugar maple), *A. rubrum* (Red maple), *Halesia carolina* [*tetraptera*] (Silverbell)(confined to the NW part of the county), *Asimina triloba* (Pawpaw), *Ilex opaca* (American holly) and *Carpinus caroliniana* (Ironwood).

Shrubs may include *Lindera benzoin* (Spice bush), *Euonymus americanus* (Strawberry bush), *Aesculus sylvatica* (Buckeye), *Corylus cornuta* (Beaked hazelnut) and *Cornus amomum* (Silky dogwood). Vines frequently are prominent, including *Rhus* [*Toxicodendron*] *radicans* (Poison ivy), *Parthenocissus quinquefolia* (Virginia creeper), *Anisostichus* [*Bignonia*] *capreolata* (Cross vine), *Vitis* spp. (Grape), *Menispermum canadense* (Moonseed) and *Smilax* spp (Greenbrier).

The herb layer is generally lush and diverse. Species include *Erythronium americanum* [*umbilicatum*] (Trout lily), *Claytonia virginica* (Spring beauty), *Stellaria pubera* (Chickweed), *Solidago pubera* (Goldenrod), *Aster divaricatus* (Aster), *Elymus virginicus* (Wild rye grass), *Polystichum acrostichoides* (Christmas fern), *Botrychium virginianum* (Rattlesnake fern), *Uvularia sessilifolia* (Bellflower), *Boehmeria cylindrica* (False nettle), and *Hystrix patula* [*Elymus hystrix*](Bottlebrush grass). *Uniola* [*Chasmanthium*] *latifolium, U.* [*Chasmanthium*] *laxa, Sedum ternatum* (Stonecrop), *Geum canadense* (Avens), *Tovara* [*Polygonum*] *virginianum* (Jumpseed), *Verbesina alternifolia, Impatiens capensis* (Touch-me-not), *Cryptotaenia canadensis* (Honewort), *Viola* spp. (Violet) and *Arisaema triphyllum* (Jack-in-the-pulpit) are also common.

In many cases, Piedmont Alluvial Forests contain only a few trees. The small size and heterogeneous nature of small floodplains, compared to larger floodplains, may make them less likely to be disturbed deliberately by activities such as agriculture or forestry. However, channeling of many small streams very destructive to floodplain communities. Many places, if heavily disturbed, are invaded by *Lonicera japonica* (Japanese honeysuckle) and *Microstegium vimineum.*

Rare plants in this type of community may include *Aster commixtus* [*mirabilis*] (Piedmont aster), *Carex projecta* (Sedge), *Dirca palustris* (Leatherwood), *Ptelea trifoliata* (Wafer ash), *Quercus bicolor* (Swamp white oak), *Q. meuhlenbergii* (Yellow chestnut oak), *Scutellaria parvula* (Skullcap) and *Silphium perfoliatum* ssp. *connatum* (Cup-plant).

Piedmont Bottomland Forest

Bottomland forests occur on floodplain ridges and terraces other than active levees adjacent to the river channel. These communities are flooded occasionally, but are

seldom disturbed by flowing water. However, there is a broad range of wetness, related to the height of ridges or terraces.

Sites may vary due to different alluvial materials and their effect on soil fertility. The fertility and infrequent flooding of these sites make them excellent farm lands. The soils are various alluvial types. Many Bottomland forests exist as successional forests grown up from abandoned fields, although they are believed to form a stable climax forest.

This type of community is found in the following Gaston County locations:

- Stagecoach Road Granitic Outcrop (in part)
- Thornburg Shoals Granitic Outcrop (in part)
- Laurel Hill Nursery Forest (in part)
- Penegar Gastonia South (in part)
- Ferguson Ridge Road (in part)

The canopy is uneven-aged and regeneration occurs in gaps. The canopy is dominated by various bottomland trees such as *Liriodendron tulipifera* (Yellow poplar), *Liquidambar styraciflua* (Sweetgum), *Quercus falcata* var. *pagodaefolia* [*padoga*] (Swamp Spanish oak), *Q. michauxii* (Swamp white oak), *Ulmus americana* (American elm), *Celtis laevigata* (Hackberry), *Fraxinus pennsylvanica* (Green ash), *Carya ovata* (Shagbark hickory), and *C. cordiformis* (Bitternut hickory).

Understory trees include *Carpinus caroliniana* (Ironwood), *Acer saccharum* ssp. *floridanum* [*floridanum*] (Southern Sugar maple), *A. rubrum* (Red maple), *Cornus florida* (Flowering dogwood), *Ilex opaca* (American holly), and *Asimina triloba* (Pawpaw).

Shrubs include *Aesculus sylvatica* (Buckeye) and *Euonymus americanus* (Strawberry bush) with *Arundinaria gigantea* (Giant cane) often forming dense thickets. Vines are frequent, including *Rhus* [*Toxicodendron*] *radicans* (Poison ivy), *Parthenocissus quinquefolia* (Virginia creeper), *Anisostichus* [*Bignonia*] *capreolata* (Cross vine), *Smilax* spp. (Greenbrier), *Menispermum canadense* (Moonseed) and *Vitis* spp. (Grape).

Herbs include *Boehmeria cylindrica* (False nettle), *Polystichum acrostichoides* (Christmas fern), *Cryptotaenia canadensis* (Honewort), *Tovara* [*Polygonum*] *virginianum* (Jumpseed), *Arisaema triphyllum* (Jack-in-the-pulpit), *Viola* spp. (Violet), *Elymus virginicus* (Wild rye grass), *Solidago caesia* (Goldenrod), *Aster divaricatus* (Aster), *Uniola* [*Chasmanthium*] *latifolium* and *U.* [*Chasmanthium*] *laxa.*

Areas that have been cleared or heavily logged may be dominated by just a few disturbance species, such as *Acer rubrum* (Red maple), *Liquidambar styraciflua* (Sweetgum), *Platanus occidentalis* (Sycamore), *Ligustrum sinense* (Privet), *Lonicera japonica* (Japanese honeysuckle) or *Microstegium vimineum.*

Rare plants that could be present in bottomland forests are *Cirsium* [*Carduus*] *carolinianum* (Carolina thistle), *Dryopteris spinulosa* [*carthusiana*] (Spinulose Wood fern) and *Silphium perfoliatum* (Cup-plant).

Piedmont Levee Forest

These forests occur on natural levees next to rivers, and they are dominated by the forces of the river. Vegetation may be disturbed directly by flooding, and may consist of mature climax forest or may be in various stages of primary or secondary succession. The periodic addition of nutrients in flood-deposited sediment makes levee sites very fertile. Growth is rapid. The soil is a medium or coarse grained alluvial type.

In Gaston County, this type of community is found in portions of the Penegar Gastonia South site.

The canopy of a Piedmont Levee Forest is dominated by a mixture of bottomland trees, such as *Platanus occidentalis* (Sycamore), *Betula nigra* (River birch), *Celtis laevigata* (Hackberry), *Acer negundo* (Box elder), *Liquidambar styraciflua* (Sweetgum), *Quercus falcata* var. *pagodaefolia* [*pagoda*] (Swamp Spanish oak), *Q. michauxii* (Swamp white oak), *Liriodendron tulipifera* (Yellow poplar), *Fraxinus pennsylvanica* (Green ash), *Ulmus americana* (American elm), *Carya cordiformis* (Bitternut hickory), *Juglans nigra* (Black walnut), and *Carya ovata* (Shagbark hickory).

Shrubs include *Lindera benzoin* (Spicebush), *Aseculus sylvatica* (Buckeye), *Xanthorhiza simplicissima* (Yellow-root) and *Arundinaria gigantea* (Giant cane). Woody vines are common, such as *Rhus* [*Toxicodendron*] *radicans* (Poison ivy), *Parthenocissus quinquefolia* (Virginia creeper), *Anisostichus* [*Bignonia*] *capreolata* (Cross vine), *Smilax* spp. (Greenbrier), *Campsis radicans* (Trumpet creeper), and *Vitis* spp. (Grape).

The herb layer is lush and usually fairly diverse. It frequently includes *Boehmeria cylindrica* (False nettle), *Uniola* [*Chasmanthium*]*latifolium*, *Hystrix patula* [*Elymus hystrix*] (Bottlebrush grass), *Verbesina alternifolia* (Alternate-leaf verbesina), *Saxifraga virginiensis* (Saxifrage), *Sedum ternatum* (Stonecrop), *Solidago caesia* (Goldenrod), and *Aster divaricatus* (Aster). *Clematis virginiana* (Virgin's bower), *Botrychium virginianum* (Rattlesnake fern), *Elymus virginicus* (Wild rye grass), *Claytonia virginiana* (Spring-beauty), *Stellaria pubera* (Chickweed), *Viola* spp. (Violet) and *Rudbeckia laciniata* (Coneflower) are also present.

This community is subject to invasion by exotic species, especially if it has been disturbed in the past. *Lonicera japonica* (Japanese honeysuckle), *Microstegium vimineum* and *Ligustrum sinense* (Privet) may dominate large areas to the exclusion of the native flora.

Rare plants are not usually found Piedmont Levee Forest communities in Gaston County.

Piedmont Monadnock Forest

Monadnocks are hills that project above the surrounding topography. Monadnocks and high ridges occur because they have rock bases that are highly resistant to erosion. Probably due to a combination of exposure, dryness and poor soil, Piedmont Monadnock Forests generally support low plant diversity.

These communities have rocky, well-drained soils such Tatum and Uwharrie. Such soils tend to be acidic and nutrient-poor. The hydrology is dry to xeric.

This type of community is found in the following Gaston County locations:

- Crowders Mountain State Park (in part)
- Pinnacle Road (in part)
- South Pasour Mountain (in part)
- Middle Pasour Mountain (in part)
- Unity Church Road (in part)

The canopy is strongly dominated by *Quercus prinus* [*montana*] (Rock chestnut oak). Other canopy species might include *Q. alba* (white oak), *Q. coccinea* (Scarlet oak), *Q. stellata* (Post oak), *Q. marilandica* (Black jack oak), *Q. velutina* (Black oak), *Carya glabra* (Pignut hickory), *C. tomentosa* [*alba*] (Mockernut hickory), *Pinus virginiana* (Scrub pine), and *P. echinata* (Shortleaf pine).

The subcanopy may be *Oxydendrum arboreum* (Sourwood), *Acer rubrum* (Red maple), *Nyssa sylvatica* (Black gum), and *Juniperus virginiana* (Red cedar).

The understory and shrub layers are sparse, giving a generally open impression. The scattered shrub layer may include *Vaccinium vacillans* [pallidum] (Blueberry), *Vaccinium stamineum* (Gooseberry), *Kalmia latifolia* (Mt. laurel), *Symplocos tinctoria* (Horse sugar), *Rhus copallina*, (Winged sumac), and *Sassafras albidum*.

The herb layer is also sparse, with *Chimaphila maculata* (Spotted wintergreen), *Tephrosia virginiana* (Goat's rue), *Hieracium venosum* (Rattlesnake-weed), *Coreopsis major, Epigea repens* (Trailing arbutus), and *Smilax ecirrhata* var. *biltmoreana* [*biltmoreana*].

The exposed nature of monadnocks makes these forests very susceptible to natural disturbances such as high winds and lightening. Canopy gaps probably are larger and more frequent than in most Piedmont forests. With increased disturbance and dryness, pines become a more important part of the forest. Fires probably occur periodically, more frequently than in most Piedmont forests. Because of the sparse herb layer and the fire-tolerant component species, however, fires often have little effect on community composition.

Rare plant species may include *Amorpha schwerinii*, *Fothergilla major* (Witch-alder), *Thermposis mollis* var. *mollis*, *Smilax ecirrhata* var. *biltmoreana* [*biltmoreana*].

Piedmont Semipermanent Impoundment

This type of community results from beaver ponding activity and small, old, and undisturbed man-made impoundments in floodplains and low valleys. They differ from surrounding floodplain communities by the occurrence of permanent or semi-permanent standing water. Man-made ponds are considered part of this category if they meet the following criteria:

- Are in small to large floodplains
- Are of the same size scale as natural beaver ponds
- Have been established a long time
- Have not had the site significantly modified other than by the flooding

At the upper end of the impoundment, the standing water in these communities usually grades into stream or river floodplain communities. Along the sides, depending on slope, the communities may be either floodplain or upland.

The soils existing before the impoundment will be modified by flooding and gradually covered by clayey or mucky sediment. The soils generally are not distinguished in soil surveys. The hydrology is palustrine, permanently flooded in the center, grading outward to the prevailing hydrology of the surrounding area. Younger ponds are likely to have dead stems of trees that occurred on the site before impoundment.

This type of community occurs in Gaston County in portions of the Ferguson's Ridge Road site.

In general, there is no tree canopy unless the pond is very shallow. Flood-tolerant trees such as *Acer rubrum* (Red maple), *Quercus lyrata* (Overcup oak) or *Q. phellos* (Willow oak) may survive or become established. Wetland shrubs such as *Cephalanthus occidentalis* (Buttonbush), *Alnus serrulata* (Alder), *Salix* spp. (Willow) and *Rosa palustris* (Swamp rose) may become established in old stumps and along the edge.

Common herbs include *Scirpus cyperinus* (Bulrush), *Juncus* spp. (Rush), *Saururus cernuus* (Lizard's tail), *Carex* spp. (Sedge), *Hibiscus moscheutos* (Marsh mallow) and *Ludwigia* spp. In deeper water, aquatic plants such as *Peltandra virginica* (Arrow arum), *Nuphar* spp. (Water lily) and *Lemna perpusilla* (Duckweed) may occur.

The isolation of these ponds may make accidents of dispersal important factors in the types of flora and fauna that are present. The chance meeting of this habitat with the correct aquatic plant seed or propagule, or an animal bringing in mud from another pond, may result in unusual species being present. Amphibian and aquatic animals may be of significant quantity and or quality in this type of community.

A Piedmont Semipermanent Impoundment community may be subject to severe disturbances at irregular intervals. Because they are located on floodplains, flooding may bring in nutrients and sediment. Damage or deterioration may break down the dam and temporarily or permanently drain the pond. Beavers may raise the water level, dig

channels and cut trees. In the absence of disturbance, the ponds slowly fill with clayey or mucky sediment and then are invaded by trees, with *Fraxinus pennsylvanica* (Green ash) as one of the first invaders.

There are no known rare plant species known from this type of community.

Piedmont/Pasture Meadow Bog

This type of community is a possible variant of Low Elevation Seep. It typically does not occur naturally in its existing form. It is usually the by-product of active pasture usage along a small tributary or seepage area where the topography allows water to accumulate and disturbance tends to keep the site open.

The soils tend to be saturated and mucky. These areas are generally small, covering one to two acres. This type of community occurs in the following Gaston County locations:

- Friday Sites 1 and 2
- Jenkins Site

Often trees and shrubs encroach into the wetland, depending on the management and activity of livestock in the area. The most common shrub is *Alnus serrulata* (Alder), with a mixture of herbaceous species including *Saururus cernuus* (Lizard's tail), *Impatiens capensis* (Touch-me-not), *Arundinaria gigantea* (Cane), *Juncus* spp (Rush), *Carex* spp. (Sedge), *Boehmeria cylindrica* (False nettle), Isoetes spp. (Quillwort), *Sphagnum* spp. (Peatmoss), and various grasses.

These areas are important breeding and foraging sites for amphibians and reptiles. The Bog turtle is found in this type of habitat.

Rare Plants and Communities

Although Gaston County was once covered primarily by Oak-Hickory and Mesic Mixed Hardwood forests, these have been greatly modified by agriculture, timbering or development. The forests along the Catawba River (Levee, Bottomland and Alluvial) have also been greatly modified by agriculture and timbering. Only pockets of the original flora exist.

The most unusual plant communities in the county with a significant level of integrity are the Piedmont Monadnock Forest, Low Elevation Rocky Summit and Pine/Oak Heath. Fortunately, the acquisition of the Crowders Mountain-Kings Pinnacle complex by the N.C. Department of Parks and Recreation has protected the largest representative of these communities. Two other monadnocks occur in the county, as part of the Pasour Mountain complex. Table 3 shows the status and rank of these communities.

Table 3. Natural Communities historically reported or known to occur in Gaston County as of the Natural Heritage Program for January 1999.

	Status*		Rank*		Occurrence
Natural Community	NC	US	NC	Global	Documented
Basic Oak - Hickory Forest	-	-	S3	G4	Yes
Dry Oak - Hickory Forest	-	-	S4	G5	Yes
Dry-Mesic Oak-Hickory Forest	-	-	S5	G5	Yes
Granitic Flatrock	-	-	S2	G3	Yes
Low Elevation Rocky Summit	-	-	S2	G2	Yes
Mesic Mixed Hardwood Forest	-	-	S4	G5T5	Yes
Piedmont Monadnock Forest	-	-	S4	G5	Yes
Pine - Oak/Heath	-	-	S4	G5	Yes

Rare Plant Species

The 1999 N.C. Natural Heritage Program lists 12 plant species in Gaston County that are of special concern (see Appendix 7 for an explanation of species status categories.) Nine of these are considered to be current components of the flora. Three are listed as historical sightings, meaning there are specimens in some herbarium, but the species has not been documented in the past 50 years. These three are *Fothergilla major* (Large witch-alder), *Quercus prinoides* (Dwarf chinquapin oak) and *Smilax ecirrhata* var. *biltmoreana* [*biltmoreana*] (Biltmore carrion-flower).

Table 4 shows the status and rank of the 12 species of concern. Species documented since 1990, considered to be current at this time, are listed as 'Yes.' Species that have not been documented recently, but are represented by specimens in the UNCC herbarium prior to 1990, are shown as <1990. It is hoped that these species can be redocumented with more current collections, and that even *Quercus prinoides*, last reported in 1910 in an obscure location, may be found. Note that two species, *Fothergilla major* (Large witch-alder) and *Smilax ecirrhata* var. *biltmoreana* [*biltmoreana*] (Biltmore carrion-flower), which were previously known only in historical records, were reported in this survey.

Five of the vascular plants of concern are associated with the variety of habitats and communities at Crowders Mountain State Park. These are *Amorpha schwerini* (Piedmont indigo-bush), *Asplenium bradleyi* (Bradley's spleenwort), *Juniperus communis* var. *depressa* (Dwarf juniper), *Quercus ilicifolia* (Bear oak) and *Thermopsis mollis* (Appalachian golden-banner). One additional occurrence of *Juniperus communis* var. *depressa* was documented in the survey, nearby but outside of the park boundary. One additional location for *Quercus ilicifolia* also was documented.

Table 4. Rare vascular plant species historically reported or known to occur in Gaston County as of the Natural Heritage Program, January, 1999.

	Status*		Rank*		Occurrence
Species	**NC**	**US**	**NC**	**Global**	**Documented**
Amorpha schwerini Piedmont indigo-bush	SR	-	S3	G3	<1990
Asplenium bradleyi Bradley's spleenwort	C	-	S1	G4	<1990
Aster georgianus Georgia aster	C/PE	FSC	S2	G2G3	Yes
Fothergilla major Large witch-alder	C	-	S2	G3	Yes
Helianthus schweinitzii Schweinitz's sunflower	E	E	S2	G2	Yes
Juniperus communis var. *depressa* Dwarf juniper	C	-	S1	G5T5	<1990
Magnolia macrophylla Bigleaf Magnolia	SR	-	S2	G5	Yes
Quercus ilicifolia Bear Oak	SR	-	S1	G5	Yes
Quercus prinoides Dwarf chinquapin oak	C	-	S2	G5	No
Schisandra glabra Magnolia vine	T-SC	-	S1	G3	Yes
Smilax biltmoreana Biltmore carrion-flower	C	-	S3	G3	Yes
Thermopsis mollis Appalachian golden-banner	SR	-	S2	G3G4	Yes

* *See Appendix 7 for explanation of rankings.*

The importance of Crowders Mountain State Park as a refuge for biological species cannot be underestimated. However, some species require management. Since fire has been repressed in the park, the Bear oak population has declined. A recent report on this problem (Barden, 1998) has outlined the history of the effects of fire on the Bear oak and has led to further considerations of management strategy within the park.

Plants Documented for the First Time by the Inventory

Three species on the state list of rare plants were documented for the first time in Gaston County as a result of the Natural Heritage Inventory field work. These are *Aster georgianus* (Georgia aster), *Helianthus schweinitzii* (Schweinitz's sunflower) and *Schisandra glabra* (Magnolia vine). *Aster georgianus* was found at two sites, one along a

power line right-of-way and one in the woods. One of the sunflower sites is a roadside/small power line right-of-way. The other is a large transmission power line right-of-way.

Originally, the roadside site for *Aster georgianus* was along an unpaved road. Despite paving of the road in 1998, which destroyed much of the population, the nearby group of plants under the small power line is doing well. The roadside population may recover. The two groups of sunflowers under the large transmission power line are in jeopardy because of Duke Power's decision to spray transmission rights-of-way. Both groups of plants were sprayed in the fall of 1998. One group was reduced from about 100 plants to 14 plants in 1999.

The other group of more than 50 plants was unaffected. It is apparent that the sunflower's existence is dependent on management. Management by herbicide is detrimental to the sunflower and possibly any other broad-leaf species such as *Aster georgianus,* that grow in rights-of-way. Duke Power has been receptive to posting no spray signs to protect areas. Thus, continued communication with Duke Power is important in order to protect these two groups of plants and any other areas along power lines that may be located in the future.

Unexpected Species

Occasionally, a survey reveals a totally unexpected species that provides justification and rationale for natural heritage surveys. *Schisandra glabra* was discovered at one of the sites near the South Fork of the Catawba River. This is the first report of this species in the Carolina Piedmont. In the Carolinas, *Schisandra glabra* usually occurs in the Coastal Plain, (see Figure 6) even though it occurs in the Piedmont of Georgia and in the Ridge and Valley Province of Alabama. It is very important to protect this population and the site where it is found. This site has a high species diversity.

Magnolia Macrophylla

Probably no other species involved in this survey has attracted more attention than *Magnolia macrophylla* (Bigleaf magnolia). It has the largest simple leaf of any species in the temperate world and one of the largest flowers. Figure 7 shows 38 observed occurrences in Gaston County. Most of these sites are in the northeast quadrant, although a few occur in the southeast and northwest.

This magnificent subcanopy species is abundant in Gaston County, but absent just across the river in neighboring Mecklenburg County. This type of magnolia has been reported from Lincoln, Iredell and Rowan Counties in the Piedmont and from Cumberland and Wake counties in the N.C. Coastal Plain. These trees are also reported in York and Richland counties, and possibly Charleston and Dorchester Counties in South Carolina.

The Lincoln County site is at Magnolia Grove, just across the Gaston County line at the headwaters of Hoyle Creek, which flows into Gaston County. These plants possibly resulted from a cultivation of the species by the landowners, although it is just as likely that the species occurs naturally in Lincoln County. Botanical investigation of Lincoln

County is minimal. Six sites along Four Mile Creek in Iredell County appear to be native occurrences. Although the species has been reported in Rowan County, there is no documentation for it in either the *Manual of the Vascular Flora of the Carolinas* (Radford et al., 1968), or in the *Natural Areas Inventory for Rowan County* (Baranski 1994).

The plants occurring in the North Carolina Coastal Plain may be cultivated. Those in Wake County are in a park and were probably planted. This may also be the case for the plants in Cumberland County.

In South Carolina, only the site in York County, which is just south of Gaston County, is most likely a native population. A recently discovered record of *Magnolia macrophylla* in Richland County may also be a native specimen, but efforts to document its origin are inconclusive. According to Dr. John Nelson, Curator of the A.C. Moore Herbarium at the University of South Carolina, the Richland County specimen was from a historical plantation known to have collected and raised trees for distribution. There is no way to document whether *Magnolia macrophylla* grew there originally, or was brought in from another area. The sites for Charleston and Dorchester counties are noted in the *Manual of the Vascular Flora of the Carolinas* (Radford et al., 1968). These, however, are likely escapes or cultivated specimens from the Michaux garden.

Whatever the explanations for the limited occurrence of *Magnolia macrophylla* in the other counties, it seems possible that Gaston County is the natural home for this species in the Carolinas. C. Williams details the history of this species quite well in a 1999 paper *André Michaux and the Discovery of Magnolia macrophylla in North Carolina* (Castanea 64:1-13).

Figure 6. Counties of Occurance for *Schisandra glabra*.

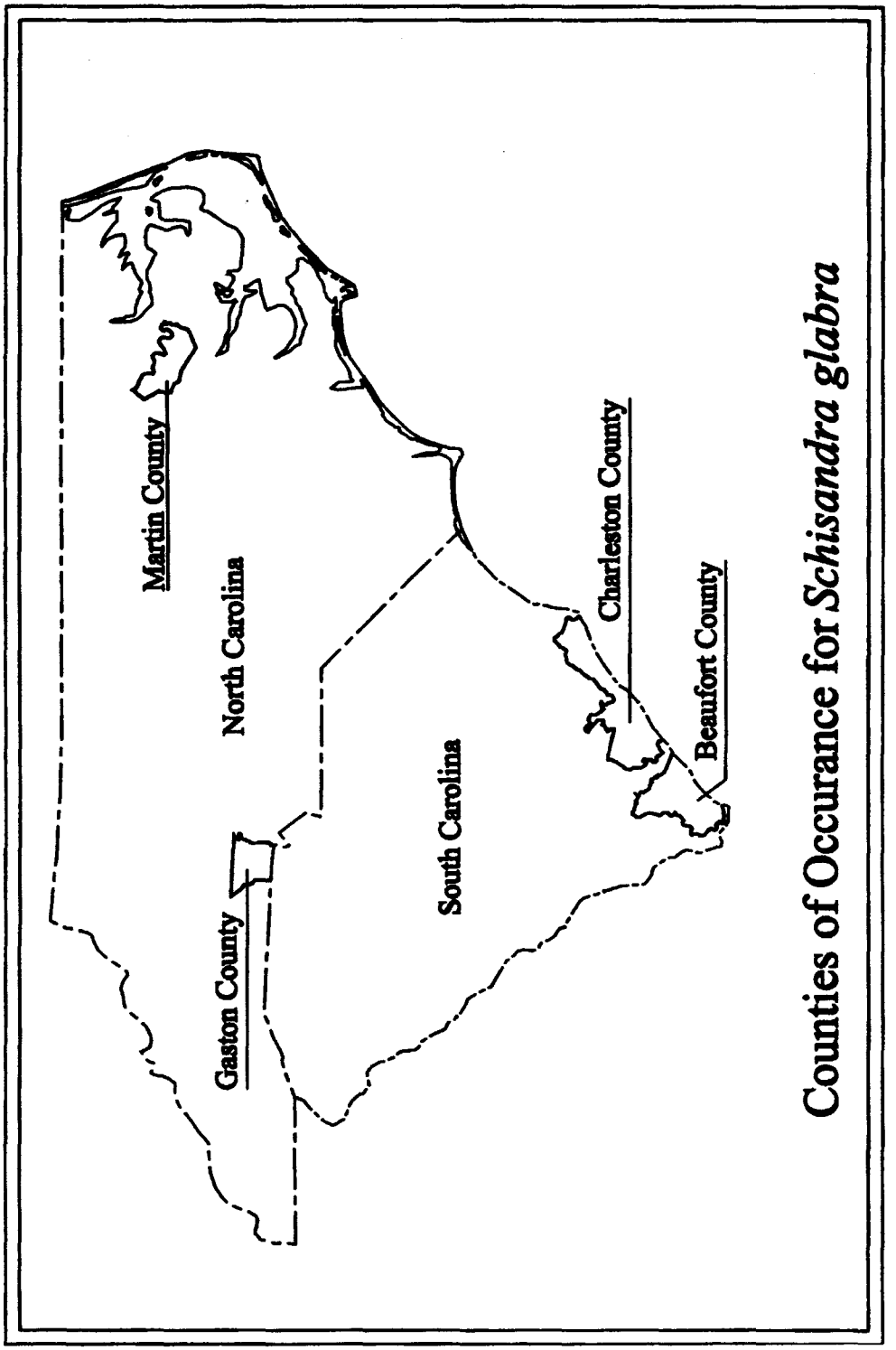
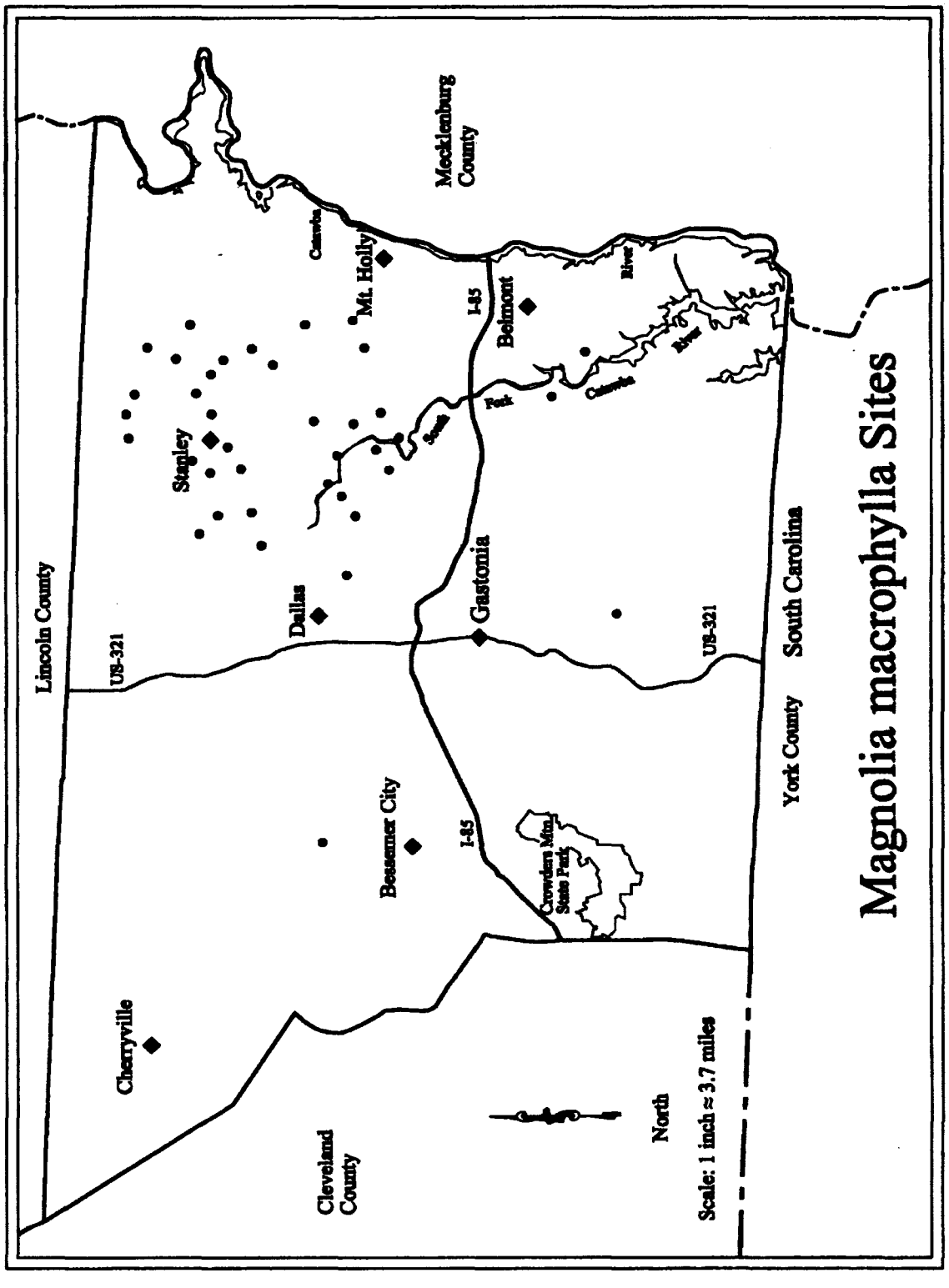


Figure 7. *Magnolia macrophylla* sites.



Comparison of the Flora of Gaston and Mecklenburg Counties

When the floral populations of adjacent counties are surveyed, relationships are observed and comparisons can be made. Many of the same species of plants inhabit both Gaston and Mecklenburg counties. Different physical conditions, however, account for some differences in plant communities in the two areas.

The geology of the two counties accounts for some of the difference. The Mafic Depression and Xeric Hardpan communities of Mecklenburg County are not present in Gaston County; and the Piedmont Monadnock and Chestnut Oak Forests of Gaston County are not present in Mecklenburg County.

Quercus ilicifolia (Bear oak), *Xerophyllum asphodeloides* (Turkey-beard), *Campanula divaricata*, *Comptonia peregrina* (Sweet fern) and *Juniperus communis* var. *depressa* (Dwarf juniper) are species not found in Mecklenburg because of the lack of habitat.

Montane species (those generally found in mountainous areas) are relatively more abundant in Gaston County than in Mecklenburg. This is probably due to microclimate variations associated with cooler, more moist ravines that are less common in Mecklenburg County. Some montane species that are relatively common in Gaston County are uncommon or absent in Mecklenburg County. These include species such as *Corylus cornuta* (Beaked hazelnut), *Castanea dentata* (American chestnut), *Halesia carolina* [*tetraptera*] (Silverbell), *Cornus alternifolia* (Alternate-leaved dogwood), *Kalmia latifolia* (Mountain laurel), and *Leucothoe axillaris* var. *editorum*. Several other montane species occur in Mecklenburg, but are uncommon. These include *Trautvettaria carolinensis* and *Aralia racemosa* (Spikenard).

Chapter 3 References

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Chapter 4 – Wildlife of Gaston County

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Introduction

Natural areas within Gaston County and the surrounding region are being developed at an increasing rate. These areas provide vital resources such as food, water, shelter, and breeding space that are necessary to the survival of native wildlife species in the county. Any patches of natural areas left after development are often severely degraded and isolated and are no longer able to support viable populations of many wild animal species.

The citizens of Gaston County have strong ties to the land and the natural world. They place a high value on their natural heritage, the wondrous diversity of plants, animals, and natural communities found around them. Many wish to preserve the quality of the county's natural environment for the benefit of wildlife and for future generations of Gaston County residents. The information contained in this chapter and the related appendices is intended to provide a detailed look at the diversity of animal species and wildlife habitats found within the county and to inspire action towards the conservation of these wild animals and wild places. It is intended to be used as one tool in helping to conserve wildlife species and wildlife habitats in Gaston County well into the next millennium and beyond.

Methodology

The Gaston County Natural Heritage Inventory represents the first comprehensive documentation of the wildlife species and important wildlife habitat areas of Gaston County. The following were the primary goals of this process:

- To collect information about animal wildlife in the area
- To organize that information into a single source
- To provide insight into county wildlife-habitat associations
- To identify habitat areas important to a high diversity of wildlife species
- To make recommendations for future research needs

The data compiled here can be used as a guide for future research, for land use planning, and for resource management decision making.

Data was collected and compiled from approximately 25 published sources and from 35 unpublished records. The data presented provides information on records of both rare and common faunal species. Existing species records and distribution data were integrated with knowledge regarding habitat preferences from published sources and from ten years of field experience in this area.

Natural community types identified during the survey of vegetation and plant communities were integrated with the wildlife data to create natural community - wildlife association habitat lists. A detailed understanding of existing natural community types and the habitat requirements of wildlife species is one of the best predictors of the occurrence of wildlife species.

Nomenclature sources for the wildlife species lists are cited individually on each list.

Wildlife Species – Habitat Associations

There are four primary types of wildlife habitats in Gaston County. These include the following:

- Upland Forest/Rock Outcrop
- Mesic Forest/Bottomland Forest/Riparian Corridor
- Forest-Edge
- Open Habitat

Each of these habitat types can incorporate several types of the natural vegetative communities described in Chapter 3. This is because animal species, unlike most plant species often occupy a number of different types of vegetative communities.

Wildlife species recorded in Gaston County have been listed in these habitats based on one or more of the following criteria:

- Previous record of the species in the county in this habitat
- Published data on species habitat requirements
- Judgment of an experienced wildlife biologist

Some of the habitat associations can be variable and some species can be found in any or all of these habitat types. The list of species found in a particular habitat type may vary somewhat throughout the course of a year, due to changes in seasonal needs and the movement of some animals during migration.

Literature consulted for habitat associations includes: Beckstrom, 1998, Ernst, et. al., 1994, Hall, 1995, Hamel, 1992, Martin et al.,1993, Palmer and Braswell, 1995, Petranka, 1998, Webster et al., 1985, and Wilson, 1995.

Certain species from the different animal classes form the core of each habitat association. These species have similar, specific limiting habitat needs. Their presence or absence can be useful in predicting the presence or absence of other ecologically similar species. The following lists are of most use for predicting species occurrence within a particular habitat and for decision making regarding the management of multiple species on an ecosystem or landscape scale, when detailed species richness data for a particular site is unavailable.

Breeding bird species are placed into each list based on the type of primary nesting habitat they use. Breeding bird distribution within habitats can vary. Both vertical diversity (canopy heights and density) and horizontal diversity (successional stage distribution and partial openings) are important factors related to breeding bird populations in particular forest habitats. An additional 21 species of neotropical migrant birds use bottomland hardwood habitat along the Catawba River during migration. This habitat type is as critically important to the stopover ecology of these migrants as it is to the birds that breed there.

Upland Forest/Rock Outcrop

This type of wildlife habitat is usually composed of primarily dry, mature, upland forest communities and rock outcrop areas with closed or partially open canopies. It incorporates the following natural plant community types (Schafale and Weakley, 1990): Dry Oak-Hickory Forest, Basic Oak-Hickory Forest (Dry Variant), Dry-Mesic Oak-Hickory Forest, Piedmont Monadnock Forest, Low Elevation Rocky Summit, Pine-Oak /Heath, and Granitic Flatrock.

Note: In this list and those that follow, the symbol(*) designates a species that needs areas of forest interior or extensive forest tracts. Forest interior species are animals that are closely associated with core forest habitats. These animal species cannot tolerate long-term exposure to physical and/or biological edge effects (conditions found in areas where two distinct habitats border). They require core forest areas for regular and successful breeding. Core area size is included for many of the bird species. Numbers in parentheses are the minimum tract size, in hectares, required for each bird.

Mammals

Southern flying squirrel (*Glaucomys volans*)
Eastern chipmunk (*Tamias striatus*)
Gray squirrel (*Sciurus carolinensis*) - especially in oak-hickory communities
White-footed mouse (*Peromyscus leucopus*)
Golden mouse (*Ochrotomys nuttalli*)
Striped skunk (*Mephitis mephitis*)
Bobcat (*Lynx rufus*)

Birds

Black vulture (*Coragyps atratus*)
Turkey vulture (*Cathartes aura*)
Broad-winged hawk * (*Buteo platypterus*)
Red-tailed hawk (*Buteo jamaicensis*)
Wild turkey * (*Meleagris gallopavo*)
Eastern screech owl (*Otus asio*)
Great horned owl * (*Bubo virginianus*)
Red-bellied woodpecker * (*Melanerpes carolinus*) (1 ha.)
Downy woodpecker (*Picoides pubescens*)
Hairy woodpecker * (*Picoides villosa*) (18 ha.)
Pileated woodpecker * (*Dryocopus pileatus*) (405 ha.)
Eastern wood-pewee (*Contopus virens*)

Great crested flycatcher (*Myiarchus crinitus*) (1 ha.) - cavity nester, open woods
Red-eyed vireo * (*Vireo olivaceus*) (7 ha.)
Blue jay (*Cyanocitta cristata*)
American crow (*Corvus brachyrhynchos*) - usually nests in pines
Carolina chickadee (*Poecile carolinensis*)
Tufted titmouse * (*Baeolopus bicolor*) (2 ha.)
White-breasted nuthatch * (*Sitta carolinensis*) (8 ha.)
Brown-headed nuthatch (*Sitta pusilla*) - mature, relatively open pine woods
Carolina wren (*Thryothorus ludovicianus*) - prefers more moist habitat sites
Wood thrush * (*Hylocichla mustelina*) (3 ha.)
Yellow-throated warbler * (*Dendroica dominica*) - mature pines
Pine warbler * (*Dendroica pinus*) - pine forests
Ovenbird * (*Seiurus aurocapillus*) (15 ha.)
Summer tanager (*Piranga rubra*) - dry, mixed pine woods
Scarlet tanager* (*Piranga olivacea*) (30 ha.)
Northern cardinal (*Cardinalis cardinalis*)

Reptiles

Eastern box turtle * (*Terrapene carolina*) -requires high humidity microhabitat
Ground skink (*Scincella lateralis*)
Six-lined racerunner (*Cnemidophorus sexlineatus*) -possible on exposed rock outcrops
Northern black racer (*Coluber constrictor*)
Ringneck snake (*Diadophis punctatus punctatus/edwardsii*)
Corn snake (*Elaphe guttata*)
Black rat snake (*Elaphe obsoleta*)
Eastern hognose snake (*Heterodon platirhinos*) -sandy, porous soils
Mole kingsnake (*Lampropeltis calligaster*)
Eastern kingsnake (*Lampropeltis getula*)
Rough green snake (*Opheodrys aestivus*) -usually near stream
Brown snake (Storeria dekayi) -requires moist microhabitat
Southeastern crowned snake (*Tantilla coronata*)
Eastern garter snake (*Thamnophis sirtalis*)
Copperhead * (*Agkistrodon contortrix*)
Timber rattlesnake * (*Croatalus horridus*) -currently known only from Crowders Mtn.

Amphibians

Marbled salamander * (*Ambystoma opacum*) - under logs in moist are
Carolina spring salamander (*Gyrinophilus porphyriticus*) - stream headwaters and seepages
White-spotted (Slimy) salamander* (*Plethodon cylindraceus*) - under logs in moist areas
Northern red salamander (*Pseudotriton ruber*) - stream headwaters and seepages
American toad * (*Bufo americanus*) - requires moist microhabitat
Fowler's toad (*Bufo woodhouseii*) - requires moist microhabitat
Pickerel frog(*Rana palustris*) - requires moist microhabitat

Mesic Forest/Bottomland Forest/Riparian Corridor

This wildlife habitat type is made up of mature Mesic Forest community types and Lowland Palustrine communities. It includes the following natural plant community types (Schafale and Weakley, 1990): Mesic Mixed Hardwood Forest (Piedmont Subtype), Piedmont Levee Forest, Piedmont Bottomland Forest, and Piedmont Alluvial Forest.

Mammals

Opossum (*Didelphis virginiana*)
Southeastern shrew (*Sorex longirostris*)
Short-tailed shrew (*Blarina brevicauda/carolinensis*)
Little brown myotis (*Myotis lucifugus*) -foraging habitat
Gray squirrel (*Sciurus carolinensis*)
White-footed mouse (*Peromyscus leucopus*)
Golden mouse (*Ochrotomys nuttalli*)
Beaver (*Castor canadensis*)
Muskrat (*Ondatra zibethicus*)
Raccoon (*Procyon lotor*)
Mink (*Mustela vison*)
River otter (*Lontra canadensis*)
Bobcat (*Lynx rufus*)

Birds

Green heron (*Butorides virescens*)
Hooded merganser (*Lophodytes cucullatus*) - cavity nester
Wood duck * (*Aix sponsa*) - cavity nester.
Mallard (*Anas platyrhynchos*)
Opsrey (*Pandion haliaetus*) - along Catawba River.
Red-shouldered hawk * (*Buteo lineatus*) (550 ha.)
Wild turkey * (*Meleagris gallopavo*)
American woodcock (*Scolopax minor*)
Yellow-billed cuckoo * (*Coccyzus americanus*)
Barred owl * (*Strix varia*)
Ruby-throated hummingbird (*Archilochus colubris*) - often nests over a stream
Belted kingfisher (*Ceryle alcyon*) - breeds in holes in banks of streams and lakes
Downy woodpecker (*Picoides pubescens*)
Hairy woodpecker * (*Picoides villosa*) (18 ha.)
Pileated woodpecker * (*Dryocopus pileatus*) (405 ha.)
Acadian flycatcher * (*Empidonax virescens*) (37 ha.)
White-eyed vireo (*Vireo griseus*) - nests in dense swampy thickets
Yellow-throated vireo * (*Vireo flavifrons*)
Red-eyed vireo * (*Vireo olivaceus*) (7 ha.)
Blue jay (*Cyanocitta cristata*)
Fish crow (*Corvus ossifragus*)
Northern rough-winged swallow (*Stelgidopteryx serripennis*)
Cliff swallow (*Petrochelidon pyrrhonota*) - on bridges over S.Fork and Catawba Rivers
Barn swallow (*Hirundo rustica*) -nests on dams and bridges on rivers and lakes

Carolina chickadee (*Poecile carolinensis*)
Tufted titmouse * (*Baeolopus bicolor*) (2 ha.)
White-breasted nuthatch * (*Sitta carolinensis*) (8 ha.)
Carolina wren (*Thryothorus ludovicianus*)
Blue gray gnatcatcher * (*Polioptila caerulea*) (37 ha.)
Wood thrush * (*Hylocichla mustelina*) (3 ha.)
Northern parula * (*Parula americana*) (1300 ha.)
Yellow warbler (*Dendroica petechia*) - nests in wet thickets and along streamsides
Yellow-throated warbler (*Dendroica dominica*)
Prothonotary warbler * (*Protonotaria citrea*) - cavity nester
Louisiana waterthrush * (*Seiurus motacilla*) (875 ha.) - streamside/streambank breeder
Kentucky warbler * (*Oporornis formosus*) (45 ha.) - not a confirmed Gaston breeder
Northern cardinal (*Cardinalis cardinalis*)
Red-winged blackbird (*Agelaius phoeniceus*) - nests in marshes and along lake edges

Reptiles

Eastern box turtle * (*Terrapene carolina*)
Common snapping turtle (*Chelydra serpentina*) - all freshwater habitats, mostly shallow
Eastern painted turtle (*Chrysemys picta*) - slow water with basking sites, muddy bottoms
Eastern river cooter (*Pseudemys concinna*) - river areas, larger lakes
Yellowbelly slider (*Trachemys scripta*) - slow water with basking sites, muddy bottoms
Eastern mud turtle (*Kinostrenon subrubrum*) - slow water with muddy bottoms
Common musk turtle (*Sternotherus odoratus*) - slow water with muddy bottoms
Gulf Coast spiny softshell (*Apalone spinifera*) - river areas, sandy bottoms, larger lakes
Green anole (*Anolis carolinensis*)
Five-lined skink (*Eumeces fasciatus*) - Mesic Forests and streamsides
Broadhead skink * (*Eumeces laticeps*) - Mesic Forests, highly arboreal
Eastern worm snake (*Carphophis amoenus*)
Ringneck snake (*Diadophis punctatus punctatus/edwardsii*)
Black rat snake (Elaphe obsoleta)
Eastern kingsnake (*Lampropeltis getula*)
Northern water snake (*Nerodia sipedon*)
Rough green snake (*Opheodrys aestivus*)
Queen snake (*Regina septemvittata*)
Northern redbelly snake (*Storeria occipitomaculata*)
Eastern ribbon snake (*Thamnophis sauritus*) - not yet verified in county
Eastern garter snake (*Thamnophis sirtalis*)
Eastern earth snake (*Virginia valeriae*)
Copperhead * (*Agkistrodon contortrix*)

Amphibians

Spotted salamander * (*Ambystoma maculatum*) - temporary pool breeder, not in floodplain
Marbled salamander * (*Ambystoma opacum*)
Red-spotted newt (*Notophthalmus viridescens*) - terrestrial eft, adult in pools
Northern dusky salamander (*Desmognathus fuscus*) - especially stream margins
Southern two-lined salamander (*Eurycea cirrigera*)
Three-lined salamander (*Eurycea longicauda*)

White-spotted (Slimy) salamander * (*Plethodon cylindraceus*)
Eastern mud salamander * (*Pseudotriton montanus*)
American toad * (*Bufo americanus*)
Northern cricket frog (*Acris crepitans*)
Gray treefrog * (*Hyla chrysoscelis*)
Northern spring peeper (*Pseudacris crucifer*)
Upland chorus frog (*Pseudacris triseriata*)
Eastern narrowmouth toad (*Gastrophyrne carolinensis*) - not yet verified in county
Bullfrog (*Rana catesbeiana*) - requires permanent water
Green frog (*Rana clamitans*) - semi-permanent water
Pickerel frog (*Rana palustris*)
Southern leopard frog (*Rana utricularia*)

Forest-Edge Species

Species in this type of habitat are associated with the edges of various forest communities. They also regularly use nearby open areas such as fields, old fields, and open suburban areas. This type of habitat also includes suburban woodlots, parks and groves.

Mammals

Opossum (Didelphis virginiana)
Southeastern shrew (*Sorex longirostris*) - dry fields
Eastern mole (*Scalopus aquaticus*) - friable soils
Big brown bat (*Eptesicus fuscus*)
Red bat (*Lasiurus borealis*)
Eastern chipmunk (*Tamias striatus*)
Woodchuck (*Marmota monax*)
Gray squirrel (*Sciurus carolinensis*)
White-footed mouse (*Peromyscus leucopus*)
Woodland (Pine) vole (*Microtus pinetorum*)
Raccoon (*Procyon lotor*) - wet areas
Long-tailed weasel (*Mustela frenata*)
Striped skunk (*Mephitis mephitis*)
Red fox (*Vulpes vulpes*)
Gray fox (*Urocyon cinereoargentus*)
White-tailed deer (*Odocoileus virginianus*)

Birds

Northern bobwhite (*Colinus virginianus*)
Mourning dove (*Zenaida macroura*)
Eastern screech owl (*Otus asio*)
Great horned owl (*Bubo virginianus*)
Chuck-will's-widow (*Caprimulgus carolinensis*)
Whip-poor-will (*Caprimulgus vociferus*)
Ruby-throated hummingbird (*Archilochus colubris*) - suburban edge
Red-headed woodpecker (Melanerpes erythrocephalus) - in suburban areas
Downy woodpecker (*Picoides pubescens*)

Northern flicker (*Colaptes auratus*)
Eastern wood-pewee (*Contopus virens*)
Great crested flycatcher (*Myiarchus crinitus*) (1 ha.) - groves and residential woodlots
Blue jay (*Cyanocitta cristata*)
Carolina chickadee (*Poecile carolinensis*)
Tufted titmouse * (*Baeolopus bicolor*) (2 ha.)
White-breasted nuthatch * (*Sitta carolinensis*) (8 ha.)
Brown-headed nuthatch (*Sitta pusilla*) - mature, relatively open pine woods
Carolina wren (*Thryothorus ludovicianus*)
Wood thrush * (*Hylocichla mustelina*) (3 ha.) - can be in dense, rich suburban forests
American robin (*Turdus migratorius*)
Brown thrasher (*Toxostoma rufum*)
Gray catbird (*Dumetella carolinensis*) - in wet thickets, especially along stream edges
Prairie warbler (*Dendroica discolor*)
Pine warbler * (*Dendroica pinus*) - some suburban pine forests
Common yellowthroat (*Geothlypis trichas*) - usually moist thickets
Yellow-breasted chat (*Icteria virens*)
Summer tanager (*Piranga rubra*) - dry, large mixed pine woods in suburban areas
Eastern towhee (*Pipilo erythropthalmus*)
Chipping sparrow (*Spizella passerina*)
Field sparrow (*Spizella pusilla*)
Song sparrow (*Melospiza melodia*) - shrubby edges
Northern cardinal (*Cardinalis cardinalis*)
Blue grosbeak (*Guiraca caerulea*)
Indigo bunting (*Passerina cyanea*)
Common grackle (*Quiscalus quiscula*) - pine in wood edges of residential areas
Brown-headed cowbird (*Molothrus ater*) - open wood edges
Orchard oriole (Icterus spurius)
House finch (*Carpodacus mexicanus*) - primarily urban and suburban areas
American goldfinch (*Carduelis tristis*) - moist shrubby edges especially near water

Reptiles

Eastern box turtle * (*Terrapene carolina*) - may venture into moist grasslands seasonally
Eastern fence lizard (*Sceloporus undulatus*)
Green anole (*Anolis carolinensis*) - sometimes common in suburban areas
Southeastern five-lined skink (*Eumeces inexpectatus*)
Six-lined racerunner (*Cnemidophorus sexlineatus*) - dry sites
Eastern worm snake (*Carphophis amoenus*)
Northern black racer (*Coluber constrictor*)
Ringneck snake (*Diadophis punctatus punctatus/edwardsii*)
Corn snake (*Elaphe guttata*)
Black rat snake (Elaphe obsoleta)
Eastern hognose snake (*Heterodon platirhinos*) - sandy, porous soils
Mole kingsnake (*Lampropeltis calligaster*)
Eastern kingsnake (*Lampropeltis getula*)
Rough green snake (*Opheodrys aestivus*)
Northern redbelly snake (*Storeria occipitomaculata*)

Southeastern crowned snake (*Tantilla coronata*)
Eastern garter snake (*Thamnophis sirtalis*)
Eastern earth snake (*Virginia valeriae*)

Amphibians

Northern red salamander (*Pseudotriton ruber*) - under leaves in forest, meadow, and pasture

Open Habitat Species

Species included in this habitat type use fields, old fields (early successional), farm ponds, open wet meadows, suburban ponds, and open suburban areas. They are not normally associated with forest areas for foraging or breeding, but may require individual scattered trees or shrubby thickets for breeding.

Mammals

Short-tailed shrew (*Blarina brevicauda/carolinensis*)
Least shrew (*Cryptotis parva*)
Eastern mole (*Scalopus aquaticus*)
Eastern cottontail (*Sylvilagus floridanus*)
Woodchuck (*Marmota monax*)
Eastern harvest mouse (*Reithrodontomys humulis*) - wet and dry areas
Old field mouse (*Peromyscus polionotus*) - not yet confirmed in Gaston County
Hispid cotton rat (*Sigmodon hispidus*)
Meadow vole (*Microtus pennsylvanicus*) - usually wet areas
Muskrat (*Ondatra zibethicus*) - areas around ponds
Meadow jumping mouse (*Zapus hudsonius*) - usually wet areas
Striped skunk (*Mephitis mephitis*) - dry areas only
Coyote (*Canis latrans*)
Red fox (*Vulpes vulpes*)

Birds

Canada goose (*Branta canadensis*) - introduced as breeding species
Mallard (*Anas platyrhynchos*) - near water
American kestrel (*Falco sparverius*)
Eastern phoebe (*Sayornis phoebe*) - nests on bridges, buildings, ledges
Eastern kingbird (*Tyrannus tyrannus*)
Horned lark (*Eremophila alpestris*) - not yet documented breeder, bare ground nester
White-eyed vireo (*Vireo griseus*) - densely vegetated wet meadows and pastures
Purple martin (*Progne subis*) - breeds mostly in artificial cavities erected in open fields
Barn swallow (*Hirundo rustica*) - barns, road bridges
House wren (*Troglodytes aedon*) - cavity nester
Eastern bluebird (*Sialia sialis*) - cavity nester
Northern mockingbird (*Mimus polyglottos*)
Brown thrasher (*Toxostoma rufum*)
Yellow warbler (*Dendroica petechia*) - nest shrubs and saplings in around farm ponds
Prairie warbler (*Dendroica discolor*)
Common yellowthroat (*Geothlypis trichas*) - usually moist thickets

Yellow-breasted chat (*Icteria virens*)
Eastern towhee (*Pipilo erythropthalmus*) - brushy, overgrown fields and shrubby areas
Chipping sparrow (*Spizella passerina*)
Field sparrow (*Spizella pusilla*)
Grasshopper sparrow (*Ammodramus savannarum*) - grassy fields
Song sparrow (*Melospiza melodia*)
Blue grosbeak (*Guiraca caerulea*) - predominately dry brushy areas
Indigo bunting (*Passerina cyanea*) - prefer some scattered trees
Dickcissel (*Spiza americana*) - rare breeder in Gaston grassy, weedy, or agricultural fields
Red-winged blackbird (*Agelaius phoeniceus*) - edges of wet, grassy fields and ponds
Eastern meadowlark (*Sturnella magna*) - grass fields
Common grackle (*Quiscalus quiscula*) - farmyards
Brown-headed cowbird (*Molothrus ater*) - farmyards
Orchard oriole (Icterus spurius)
American goldfinch (*Carduelis tristis*) - moist shrubby edges especially near water

Reptiles

Common snapping turtle (*Chelydra serpentina*) - ponds, wet meadows
Eastern painted turtle (*Chrysemys picta*) - ponds
Yellowbelly slider (*Trachemys scripta*) - farm and suburban ponds with basking sites
Eastern mud turtle (*Kinostrenon subrubrum*) - ponds, ditches, wet meadows
Common musk turtle (*Sternotherus odoratus*) - ponds
Ground skink (*Scincella lateralis*) - occasional in grassy fields and suburban habitats
Six-lined racerunner (*Cnemidophorus sexlineatus*) - dry areas
Eastern worm snake (*Carphophis amoenus*)
Northern black racer (*Coluber constrictor*)
Ringneck snake (*Diadophis punctatus punctatus/edwardsii*)
Corn snake (*Elaphe guttata*)
Black rat snake (*Elaphe obsoleta*)
Eastern hognose snake (*Heterodon platirhinos*)
Mole kingsnake (*Lampropeltis calligaster*)
Eastern kingsnake (*Lampropeltis getula*)
Northern water snake (*Nerodia sipedon*) - suburban and farm ponds
Brown snake (*Storeria dekayi*)
Eastern ribbon snake(*Thamnophis sauritus*) - wet habitat edges, not confirmed in Gaston
Eastern garter snake (*Thamnophis sirtalis*)
Eastern earth snake (*Virginia valeriae*) - grassy meadows

Amphibians

Fowler's toad (*Bufo woodhouseii*) - near ponds and in residential areas
Northern cricket frog (*Acris crepitans*) - open, grassy borders along ponds
Gray treefrog (*Hyla chrysoscelis*) - shrubby borders along ponds
Northern spring peeper (*Pseudacris crucifer*)) - shrubby borders along ponds
Upland chorus frog (*Pseudacris triseriata*) - wet meadows, semi-permanent pools
Bullfrog (*Rana catesbeiana*) - requires permanent water, farm ponds, etc.
Green frog (*Rana clamitans*) - semi-permanent water, ditches, wet meadows, ponds, etc.

Southern leopard frog (*Rana utricularia*)
Pickerel frog (*Rana palustris*) - in summer only

Wildlife Habitat Locations in Gaston County

This section identifies areas important to the long-term survival of native wildlife species in Gaston County. Natural habitats in this area have been destroyed, fragmented, and otherwise affected by years of extensive agriculture, industrial activities, forestry practices, and urban development. Habitat loss remains the single biggest threat to the survival of the county's wildlife species. Few large areas of wildlife habitat remain intact. It is imperative that these remaining areas be maintained, with functioning ecosystems, in order to ensure the diversity, health and continued viability of Gaston County's wildlife populations.

Habitats important for wildlife, are now scattered in isolated patches throughout the county. These habitat patches are like islands within a sea of development. Currently, many of these patches are still able to support a good diversity of animal species. However, without long-term protection, species richness will decline over time and existing populations will become even more isolated. Continued degradation and attrition of habitat will allow opportunistic species (habitat generalists) to invade, and the natural diversity of native wildlife species will be altered forever.

Animal species often primarily use a core area of quality habitat, but they may use other existing habitat patches to meet both resource and reproductive needs. Corridors connecting patches encourage movement and interaction between isolated populations, allowing them to become functional metapopulations. Therefore, for long term conservation planning, the entire landscape matrix should be considered, not just core areas of existing or proposed reserves. It is also important to remember that habitats in Gaston County are not isolated by political boundaries and to recognize areas where wildlife habitat in this county connects to existing habitat in surrounding counties. Suggestions for the creation of corridors and buffer zones to help reduce habitat isolation are included in the discussion of some of the sites below.

Interstate highway I-85 bisects Gaston County horizontally into two regions. U.S. Highway 321 vertically bisects the northern half of the county. These highways are significant because they are virtually impenetrable barriers to the movement of most terrestrial wildlife species. Bridges spanning the Catawba and the South Fork Rivers allow some movement of wildlife below the interstate, along the river corridors, but there are few other places (mostly, relatively small stream culverts) where animals can cross. In areas where natural habitat still remains intact on both sides, wildlife overpasses or underpasses could be constructed to allow the movement of animals across these barriers.

Maintaining core wildlife areas of sufficient size, providing connections between habitat patches, and insuring an unpolluted environment, are the key ingredients required for the long-term continued existence of Gaston County's wildlife heritage.

Most wildlife regions identified below are directly connected to a river or creek corridor. Therefore, preservation of natural areas along these corridors will help benefit the greatest diversity of wildlife species. Support of ongoing conservation initiatives along river and creek corridors in the county should be a high priority.

Note: Specific species that might be expected within a particular type of natural community are listed in the preceding pages under the heading Wildlife Species – Habitat Areas.

The Catawba River Corridor

This area is composed of two sections, the Mountain Island Lake section, and the Lake Wylie section.

Mountain Island Lake Section

Many areas along Mountain Island Lake are slated for development, or have already been developed. There are however, areas of quality wildlife habitat still present along this stretch of the river. There is still time to protect these areas both for the preservation of the region's water quality and for the benefit of local wildlife species.

A tremendous opportunity exists in this area for the creation of a single large, interconnected wildlife region that would incorporate preserved wildlife habitats on both sides of the Catawba River and potentially into Cabarrus County. The "east-west corridor" identified in Mecklenburg County's *Natural Heritage Inventory* connects natural areas in Gaston County to similar areas in Cabarrus County. If managed properly, this corridor can link the Catawba and Yadkin-PeeDee watersheds. (Citizens' Environmental Advisory Council, 1998.) Connection of the areas noted below would provide an eastern anchor for this "east-west" wildlife corridor concept.

To develop a single, functional wildlife habitat, existing land reserves must be augmented and connected by the purchase of new tracts of habitat land. Preservation of these tracts must be initiated soon because development pressures continue to increase along the lake border. The following information describes areas currently making up the majority of the wildlife region around Mountain Island Lake.

Mountain Island Lake Conservation Area. This wildlife area was recently purchased from Crescent Resources with monies from the Clean Water Trust Fund. It is approximately 1300 acres in total size (including the connected habitat area set aside in Lincoln County). Some quality bottomland forest community patches still exist along the river here.

A large portion of this site has been intensively managed as a pine monoculture for timber resources. Compared with natural communities, these heavily managed stands provide little benefit to most native wildlife species. From a wildlife perspective, the wisest use of this area would be to slowly restore the managed parcels back to their original, natural community types. This action would both preserve the water quality of the lake and provide a solid core area of quality habitat for use by native wildlife species.

Additional quality wetland wildlife habitat is still present along Johnson Creek from the Catawba River into Lincoln County. Extensive patches of switchcane and cattails provide a riparian corridor usable by many wildlife species.

Duke Power Riverbend Steam Plant. Natural areas bordering this site and the adjacent habitat surrounding the boat landing harbor are usable by wildlife. Areas bordering the river include Mesic Forest habitat. Planted pine forests make up the bulk of the habitat. A good diversity of waterfowl has been documented on the tailing ponds. Development has continued within the Duke Power village peninsula, but a series of connected habitat parcels could still potentially be linked here.

Cowan's Ford Waterfowl Refuge. This is an area of rich bottomland hardwood habitat owned by Crescent Resources along the high water mark below the Lake Norman dam. This is a critical area to maintain for wildlife. It is currently managed as a waterfowl refuge in conjunction with the N.C. Wildlife Resources Commission, and it is closed to hunting. The Stephen's Road Nature Preserve and the Cowan's Ford Wildlife Refuge, owned by Mecklenburg County, border the western edge of this property.

Cowan's Ford Wildlife Refuge. This area is officially part of Mecklenburg County, but it is surrounded by Gaston County on three sides. Birds using the Catawba corridor during migration fly along and over this riverbend site.

Data from recent research on migrating birds moving through this area are included in this report (Beckstrom, 1998). Species documented during this study also use stopover habitat along the Gaston County side of the Catawba River, especially in areas with intact bottomland hardwood forest habitat.

Some undeveloped habitats still exist along the river below the Riverbend peninsula. Development is rapidly occurring in this section. More land should be preserved along the river here if at all possible, especially portions across the river from the Gar Creek water intake. At a minimum, a 100-meter buffer zone of natural habitat along the shoreline should be required to protect water quality and to provide some usable resources for wildlife in the area.

Lake Wylie Section

Most areas along the shore of the Catawba River from below the Mountain Island Lake Dam to the confluence of the Catawba and South Fork Rivers have been developed. Riparian habitat can still be found in a few patches, one just north of the I-85 bridge over the Catawba and a few others scattered along the river north of the Plant Allen site.

Duke Power Plant Allen Site. Here, Duke Power protects a relatively large tract of wildlife habitat along both the Catawba and South Fork Rivers. The Gaston Audubon Society has documented 127 species of birds here (D. Flynn and D. Crane, pers. comm.). The site contains Upland Forest habitat, Riparian habitat, and Mesic Forest habitat along with lots of forest edge, some planted pine forests and some open areas. Part of this area would be affected by the proposed connector between highways 74 and 321. The

construction of this roadway would further reduce the amount of available habitat for wildlife species in the county.

South Point. The area known as South Point is a peninsula jutting south between the South Fork of the Catawba River and the main river channel. The southern tip of this peninsula contains late successional, second-growth Upland Forest habitat patches and two areas of relatively steep slopes still harbor Mesic Mixed Hardwood communities. Some Riparian habitat is found here as well.

South Fork River Corridor

Several quality wildlife habitat areas still exist along or close to the South Fork River. Like the Catawba River corridor, habitats along the South Fork corridor are broken into two parts. These are separated into northern and a southern sections by the developed areas of Cramerton, McAdenville, and Lowell.

Northern Section

The northern section contains the highest quality areas along this corridor. Habitat types include primarily Mesic Mixed Hardwood and Bottomland Forests. The following locations make up the majority of the wildlife areas in the South Fork River Corridor.

Rankin-Redlair Area. The Rankin-Redlair Farm and Forest protects almost a mile of river corridor buffer (S. Perillo, pers. comm.). The family has worked with the Catawba Lands Conservancy to protect this forested riparian habitat through conservation easements. The Catawba Lands Conservancy has initiated a project to help other landowners protect corridor habitat for water quality and wildlife along the South Fork River. Buffer zones of 300 feet are recommended. Programs like this are vital to the long term health and survival of wildlife habitats in Gaston County.

Spencer Mountain. Spencer Mountain is a significant wildlife habitat area just west of the South Fork River. It has Dry Upland Forest and Rock Outcrop habitats. Several potential populations of interesting wildlife species are found on this mountain. Nearby Long Creek also contains quality wildlife habitat with steep slopes of Mesic Mixed Hardwood Forest dropping to Bottomland Forest along the South Fork River. Another habitat patch along the river north of Long Creek, also contains steep slopes with a rich Mesic Mixed Hardwood Forest, grading down slope into a Piedmont Bottomland Forest.

Stanley Basic Forest. The Stanley Basic Forest, a site identified by the N.C. Natural Heritage Program, is found further north off the South Fork River near Hoyle Creek. This forest is a Basic Oak-Hickory Forest (dry variant). If preserved, this habitat, along with additional patches, could connect Hoyle Creek with lands along the South Fork River. This could create one long, interconnected, high quality wildlife habitat region. Also, a connection linking South Fork buffer habitats and reserves in Gaston County with the recently preserved Paul and Agnes Rhyne Conservation Preserve in Lincoln County, would extend this wildlife region even further. This should be a priority.

Southern Section

The southern section of the South Fork River corridor is more developed than its northern counterpart. Only a few undeveloped, forested tracts still exist here. One remaining patch lies between Nixon and Gaither roads on the east side of the river.

Another site is found on the west side of the river just north of the Armstrong Road bridge. This area contains a pine forest grading into a mixed deciduous forest. It connects with Forest Cove, a residential community. Providing habitat for both wildlife and people, this community is an excellent example of how residential development and forest habitats can coexist. The existing farmland along Armstrong Road behind the Forest Cove community extends the wildlife area across the road and down to the river. Forest edge and open space wildlife species can use this patchy mosaic of forests and open space.

Bog Turtle Sites

In Gaston County, there are two documented sites containing Bog turtles. Both Bog turtle sites should receive the highest priority for permanent protection. Without these particular wet meadow habitat sites, the federally listed, disjunct Bog turtle population would become extirpated from this area. For more information on Bog Turtles, see page 4-23.

Crowders Mountain State Park

Crowders Mountain State Park contains the largest, best quality, protected area of wildlife habitat in Gaston County. Wildlife habitat types existing in the park include Upland Forest, Rock Outcrop, and Mesic Mixed Hardwood forest areas. A great diversity of wildlife species is found in this park. The area contains populations of some species that have not been found anywhere else in the county. For more information on rare species see page 4-18.

The park however, cannot stand alone as a wildlife reserve. Without connections to other habitat patches and wildlife populations, species richness will deteriorate. This will happen more quickly if development is allowed to surround the park. National parks many times the size of Crowders, have experienced this problem after development surrounded the park borders.

Recent land acquisitions have created a corridor connecting the existing park to topographic high points along the ridge line across Sherrar's gap, Stepp's Gap and Dixon Gap and down to Kings Mountain State Park and Kings Mountain National Military Park. This corridor will probably be wide enough to allow for the movement of wildlife species without forcing them to move only along a connector trail that will likely be well-traveled by human visitors to the park. The corridor also incorporates habitats along the base of the ridge. Another corridor linking the park to wildlife corridors along South Crowders Creek and down to Crowders Creek would provide additional connected space for wildlife species.

Pasour Mountain – Long Creek Corridor

The Pasour Mountains harbor quality Upland Forest habitat. This habitat is connected to Riparian habitat along Long Creek. Further buffer habitat could be added by connecting undeveloped tracts along Long Creek, thus creating a wildlife corridor reaching all the way down to Rankin Lake. Both the upland habitat on South Pasour Mountain and the wetland habitat around Rankin Lake are owned by the City of Gastonia.

Dutchmans Creek and Stanley Creek Corridors

Much of the area along these creeks has been affected by agriculture, including cattle grazing. However, both of these creek corridors still contain good quality patches of Mesic Mixed Hardwood Forest, Bottomland and Wetland habitat. Non-forested habitat patches currently found along the creeks provide resources for forest edge and open space wildlife species.

Catawba Creek

Gaston County is very fortunate to have the Daniel Stowe Botanical Garden. The garden has already made a commitment to preserving part of its property as a natural area for native wildlife. Along with the traditional focus on ornamentals, Daniel Stowe Botanical Garden personnel have started a program to collect data regarding native wildlife species. Although this property lacks extensive core forest areas, it provides forest edge and open space habitats, and the gardens attract numerous butterfly species.

Additional undeveloped, forested habitat also exists on the north end of the Catawba Creek cove area. However, residential development may prevent the creation of a wildlife corridor in this area.

Gaston County Agricultural Lands

The northwest part of Gaston County contains farmland with habitat areas for forest edge and open-space species. Acreage of farmland within the county has been declining rapidly over the past two decades, however. From 1982 to 1992, farmland acreage dropped 28%. Large farms are increasingly rare.

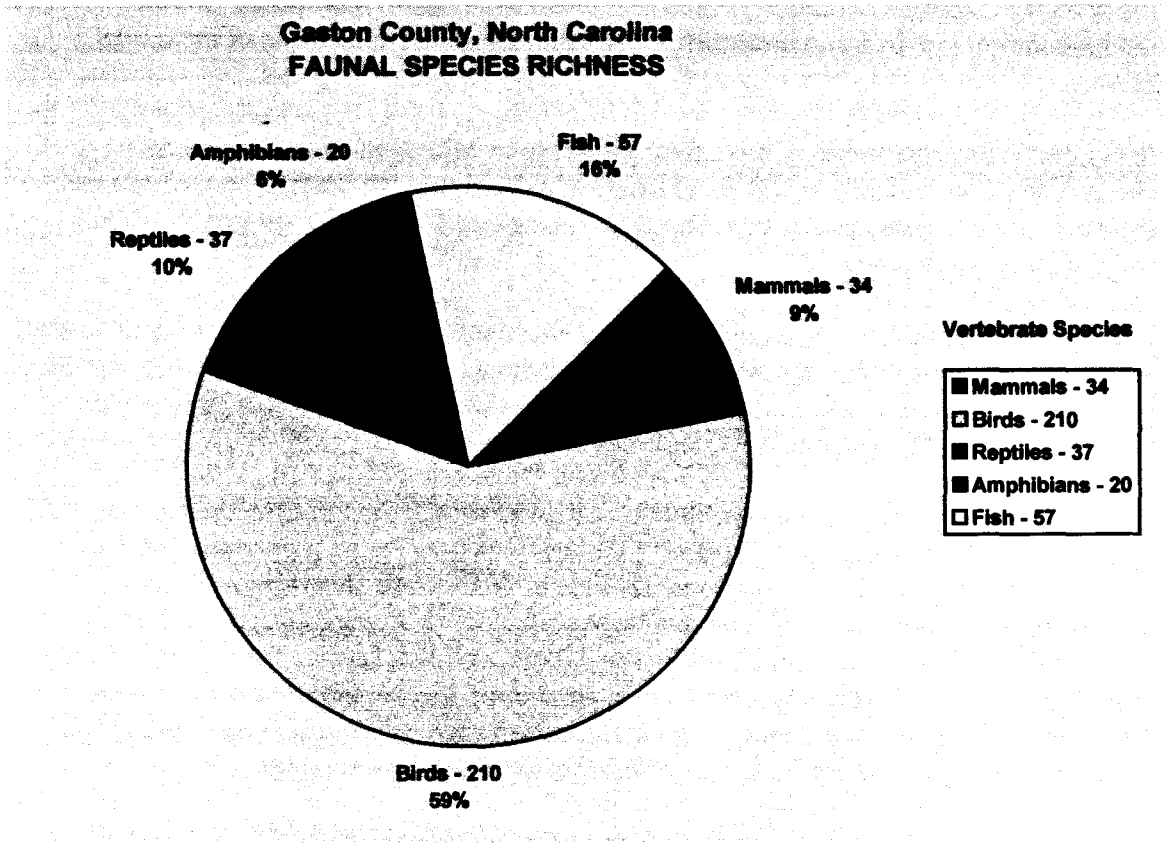
Wildlife species in farm areas are primarily habitat generalists, but these areas also provide habitat for migrating shorebirds and grassland bird species. Protection of open space and farmlands is important for rapidly developing areas such as Gaston County. Farmers can make their lands even more productive for many wildlife species by participating in the Wildlife Habitat Incentives Program (WHIP). This federal program, sponsored by the Natural Resources Conservation Service, provides financial incentives to farmers who develop more wildlife habitat areas on their farms.

Wildlife Species Lists

Figure 8 shows the distribution of faunal species in Gaston County. Appendices 2 and 3 contain detailed lists of mammal, bird, reptile, amphibian, fish, butterfly and benthic

macro-invertebrate species documented in Gaston County. Introductory discussions help highlight some specific information on species within each list. Sources for taxonomic nomenclature are cited individually on each list.

Figure 8. Faunal Species Richness in Gaston County, North Carolina.



Voucher Specimens

A voucher specimen is an organism that is collected and preserved for official verification. It indicates that the organism is correctly identified as cited in a report or used in a scientific study. Detailed information is collected along with the voucher specimen allowing for future comparisons to be made, or allowing for studies to be repeated for scientific accuracy. Photo documentation, audio recordings, or video documentation are, in some instances, substitutes for actual specimens of an animal species.

In conducting faunal surveys, it is often necessary to collect voucher specimens as taxonomic or biological support specimens. This helps ensure that the occurrence and distribution of animal species or subspecies throughout a particular geographic area has been adequately documented.

The North Carolina State Museum of Natural Sciences is the official repository of faunal voucher specimens within the state of North Carolina. Collection permits issued by the N.C. Wildlife Resources Commission stipulate that collected specimens be deposited with the N.C. State Museum.

Information regarding voucher specimens collected within Gaston County and deposited with the N.C. State Museum of Natural Sciences was used in the preparation of this report. The reptile and amphibian species lists in this section show the voucher specimens from these species that have been collected. In many cases, the collection of voucher specimens of mammal, reptile, amphibian, and fish species from Gaston County is still warranted. Voucher specimens of a number of species have not been collected from Gaston County. For example, no mammal voucher specimens from Gaston County are in the collections at the N.C. State Museum (M. Clark, pers. comm.).

Collection of voucher specimens from Gaston County could help to fill gaps in the existing literature regarding the documented occurrence and distribution of numerous animal species or subspecies in this part of the western Piedmont. Detailed written sight accounts submitted by reliable observers are suitable for documentation of bird species within the county. Birds are well documented and there is no longer a need for voucher specimens of birds unless they are being used for a specially authorized scientific study.

Note: State permits are required prior to the collection of most vertebrate animal species. Voucher specimens of rare animal species, of species with limited local population size, or of species whose rarity or population size is unknown should never be collected.

Rare Species

Many types of rare animals have been found in Gaston County. The tables in Appendix 4 show 31 species documented in Gaston that are listed as rare animals by the N.C. Natural Heritage Program, or N.C. Animal Watch List (LeGrand and Hall, 1997). Twenty of these animals species are vertebrates and eleven species are invertebrates.

Four additional mammal species are listed as being "hypothetical" species, animals that may occur in the county or may be occasional transients, but whose presence has not been documented. Three rare bird species have been documented as transients. Two mussel species that historically have been documented within the Catawba River system, but have not been documented in Gaston County, have also been included for general interest. Figure 9 shows the breakdown of rare species in Gaston County.

Rare Mammals

No mammal species listed on the N.C. Natural Heritage Program's Rare Animal List or Watch List are documented as being breeding residents in Gaston County. The long-tailed weasel (*Mustela frenata*) is believed to be an uncommon resident in appropriate woodland and old field habitats in the county, but a voucher specimen needs to be collected for verification. Long-tailed weasels are listed on the Watch List.

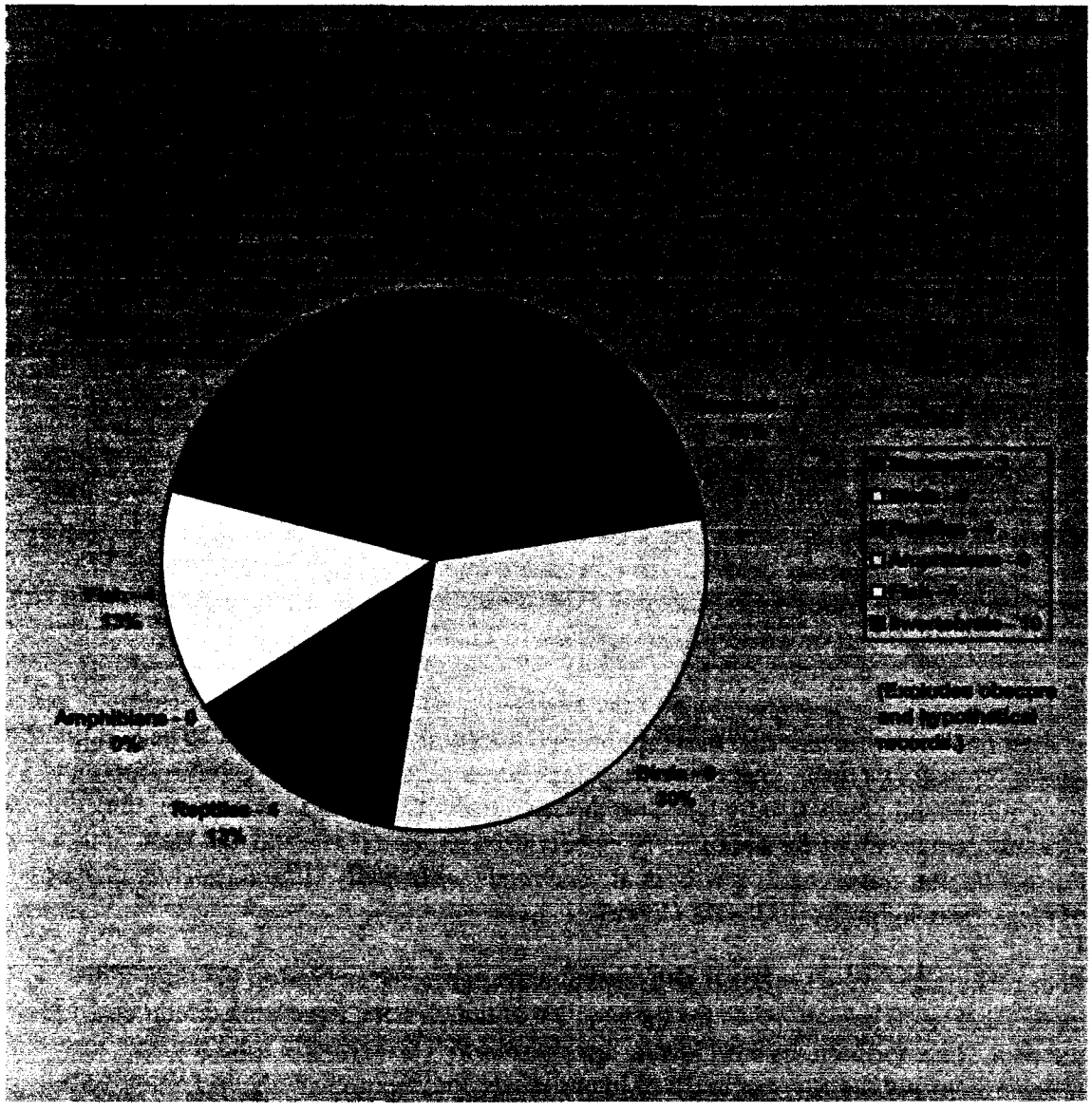
Not much is known about the presence and distribution of bat species in Gaston County. Little brown bats (*Myotis lucifugus*) have been seen feeding over the pond at Crowders Mountain State Park (D. Sarver, pers. comm.) and over Robinwood Lake (S. Tracy, pers. comm.), but no maternity colonies have been documented. Little brown bats are also listed on the state Watch List. Attics of old houses, barns and other structures should be surveyed for resident or wintering bat species.

Black bears (*Ursus americanus*) are very rare transients to this part of the Piedmont, but at least one bear was reported moving through the county within the last 15 years (J. Moore Sr. and D. Crane, pers. comm.). Black bears are classified as game animals and as such, they cannot be officially listed on the N.C. Rare Animal List. However, they do meet the requirements for listing as being significantly rare (LeGrand and Hall, 1997). Further habitat fragmentation will, in all likelihood, eventually eliminate future chances of black bear sightings in Gaston County.

Four mammal species are listed as hypothetically occurring in Gaston County. This means that good habitat exists for the species, although none have been documented in the area. The northern myotis (*Myotis septentrionalis*) and the Old field mouse (*Peromyscus polionotus*) are listed as hypothetical for Gaston County on species lists prepared by the N.C. Wildlife Resources Commission's Non-game Division The Old field mouse has expanded its range from South Carolina and should be looked for in southern Gaston County.

Good habitat exists in Gaston County for the Meadow jumping mouse (*Zapus hudsonius*), although none have been documented here. They prefer moist, open areas near running water. Gaston County is near the southern limit of the range of this species. This mouse has been documented in Mecklenburg County. There is also a documented record for Seminole bat (*Lasiurus seminolus*) in Mecklenburg County, but none in Gaston. The status of this and most other bat species within the region is unknown.

Figure 9. Rare Animal Species in Gaston County, North Carolina.



Rare Birds

There are six bird species listed on the North Carolina Rare Animal List or Watch List that breed or potentially breed in Gaston County. These include the following species:

Black vulture (*Coragyps atratus*)
Loggerhead shrike (*Lanius ludovicianus ludovicianus*)
Barn owl (*Tyto alba*)
American kestrel (*Falco sparverius*)
Cooper's hawk (*Accipiter cooperi*)
Great blue heron (*Ardea herodias*)

Black vultures have nested for years in a mixed roost with Turkey vultures on Buzzard's Roost and Kings Pinnacle at Crowders Mountain State Park. Park employees manage these nest sites. While visitors have had little impact on the site on Kings Pinnacle, impact is evident on Buzzard's Roost. Park employees have implemented measures to help isolate the Buzzard's Roost nest site from visitors (NCDENR, 1993). These measures include posting trail/area closed signs, covering existing trails with vegetation and dropping trees to prevent further visitor access.

Black vultures are listed as Species of Special Concern in the state. Other sites, like Spencer Mountain, may be used by black vultures for nesting. Breeding season reports should be followed up to determine if new nesting sites can be located. Approximately forty black vultures were seen at the mouth of Johnson Creek off Killian Road in September of 1998 (D.Seriff, pers. obs.). These birds were apparently feeding on the ground at the edge of the marsh and flushed when approached. The marsh vegetation prevented access to the site for determination of the food item. Black vultures roost in large numbers at Cowan's Ford Wildlife Refuge and forage throughout the area on both sides of the Catawba River during the winter (D. Seriff pers. obs., B. O'Leary, pers. comm.).

Loggerhead shrikes (*Lanius ludovicianus ludovicianus*) have been seen during the breeding season within the past two years (D. Crane, pers. comm.). They were formerly an uncommon breeder in the region, but breeding populations of this bird are rapidly declining. They are listed as a Species of Special Concern in North Carolina. Suitable field habitat for nesting shrikes continues to be lost to development. Confirmed shrike breeding locations should be documented and the information should be forwarded to Wayne Irvan (shrike researcher) or John Gerwin at the N.C. State Museum of Natural Sciences. The migrant Loggerhead shrike (*Lanius ludovicianus migrans*) can be found here in the winter but it migrates northward by May.

Barn owls (*Tyto alba*) have been placed on the North Carolina Watch List. Marek K. Smith has recently completed a research study of this species in Gaston and surrounding counties. Barn owls can nest at any time of the year. Nests were documented in 1989 off Highway 27 near Mount Holly, in 1992 off Carmel Road in High Shoals, in 1996 off Weaver Dairy Road, and in 1998 off Benton Street in Stanley. This owl has been sighted

off Miss Ellie Lane in Gastonia, in 1998, off Meek Road near Crowders Mountain in 1991, and off Kendrick Road in Gastonia in 1991 (M. Smith, pers. comm.).

American kestrels (*Falco sparverius*) are also on the N.C. Watch List. They have bred within Gaston County in the past, and probably still do so, but no recent records are available. There are recent breeding season records for Mecklenburg and Lincoln Counties (BBS Route #63218, D. Seriff, pers. obs.) This species is probably declining in this region. Habitats which would be suitable for nest and perch sites aswell as fields for foraging, are continually being destroyed by development. A nest box program could be implemented to help this species breed more successfully in the county. A large female kestrel was seen hawking insects from the tower guy lines on top of Spencer Mountain on September 7, 1998 (D. Seriff & J. Green, pers. obs.). American kestrels are fairly common winter residents and transients throughout the region.

Cooper's hawks (*Accipiter cooperi*) are listed as Species of Special Concern in North Carolina. The N.C. Wildlife Resources Commission has listed them as potential year-round residents that may breed in Gaston County. This hawk currently breeds in Mecklenburg County. It should still breed in Gaston County, but current breeding documentation needs to be collected. This hawk (often called the blue darter) was formerly persecuted throughout its range. Now, even with protection, it appears to be in decline. Confirmed sightings during breeding season should be followed up by attempts to identify nesting locations.

The Great Blue heron (*Ardea herodias*) is listed on the N.C. Watch List. These birds have expanded their breeding range within the region during the past few years. One nesting colony was documented on the Cabarrus-Mecklenburg line and another has been found on an island in the southern end of Lake Norman. Areas like the Johnson Creek Wetlands and islands in Mountain Island Lake should be surveyed for Great Blue heron nest colonies.

Three migrant or transient bird species have been listed as rare species in North Carolina out of general interest, and because of their Federal protection status. Bald eagles (Haliaeetus leucocephalus) are occasionally seen along the Catawba River. They have been seen from Duke Power's Plant Allen Site (D. Crane, pers. comm.) and from Mountain Island Lake near the Cowan's Ford Wildlife Refuge (L. Barden, pers. comm.). Peregrine falcons *(Falco peregrinus)* migrate through this area. They have been documented at Cowan's Ford Wildlife Refuge (D. Seriff, pers. obs.). Both the Bald eagle and the Peregrine falcon are listed as endangered in N.C. Peregrine falcons, however, are scheduled to be de-listed at the Federal level, in the near future.

The Cerulean warbler (*Dendroica cerulea*) is a neotropical migrant that is being monitored because its populations have plummeted. These birds have been documented at Crowders Mountain State Park and recently during fall migration at Cowan's Ford Wildlife Refuge (L. Beckstrom and M. Smith, pers. comm.). There is a survey underway to document the current breeding status of Cerulean warblers in North Carolina.

Rare Reptiles

The single most significant rare animal species surviving within Gaston County is the Bog turtle (*Clemmys muhlenbergii*). This turtle species has recently been listed as Threatened under the U.S. Endangered Species Act of 1973 (Federal Register: November 4, 1997 Vol. 62, No. 213, Rules and Regulations). The southern populations of Bog turtles (including those in N.C.) have been included under the decision because they are "threatened by similarity of appearance" to the severely depleted northern populations. Therefore, all Bog turtles now receive full Federal protection. Habitat destruction and illegal collection of these turtles for the pet trade, have decimated the northern populations.

The first Bog turtle in Gaston County was discovered, in 1991 by Scott Williams. He brought the turtle to the Schiele Museum for identification. There it was identified by Jim Green and the find was reported to Dennis Herman, founder of Project Bog Turtle. In 1992, Dennis Herman and Jim Green located a Bog turtle site on private property in Gaston County. Jim Green located a second site in 1993. These sites are thought to make up one of the largest and most viable populations of Bog turtles in the Piedmont

These colonies are very isolated from the other Bog turtle colonies in the state. They represent a critically important disjunct population which may be of genetic significance to the species. The landowners of the sites in question have provided a great service by allowing access to the property for field surveys and research. Jim Green has implemented a mark/recapture research project at these sites and he is managing the sites to prevent erosion. Snapping turtles and Mud turtles compete with the Bog turtles at both sites. Continued long-term management will be required. Permanent protection of this population is imperative.

Two species of rattlesnakes have been documented in Crowders Mountain State Park. These are the Carolina pygmy rattlesnake (*Sistrurus miliarius miliarius*) and the timber rattlesnake (*Crotalus horridus*). These snake species are both listed as being significantly rare on the N.C. Rare Animal List. Their populations are protected by law both on and off the park property. Two Carolina pygmy rattlesnakes, one dead and one alive, were collected by Paul Hart from the park in 1981 and 1984. They were sent to the N.C. State Museum of Natural Sciences. The living animal is still on display at the museum at this time (P. Hart, pers. comm.).

Records from southeastern Cleveland County and from Kings Mountain State Park in South Carolina suggest that one extended population of Pygmy rattlesnakes may have existed in this region prior to fragmentation. It is doubtful that sufficient corridors currently exist to maintain adequate gene flow between these populations. Dr. Wayne Van Devender of Appalachian State University, has searched unsuccessfully in recent years to find these rattlesnakes at Kings Mountain State Park (J. Sox, pers. comm.). Further research needs to be done to determine the status and distribution of Pygmy rattlesnakes in this area.

Timber rattlesnakes are still seen each year in and around Crowders Mountain State Park, though the number of reports appears to be declining (J. Sox, pers. comm.). In 1998, park staff members reported seeing around six snakes (D. Sarver and J. Sox pers. comm.). Both yellow and black phase rattlesnakes have been seen and sightings have occurred in both sections of the park. Timber rattlesnakes have been reported from May through October with sightings being most common June through August. For the protection of the snakes, park employees have relocated any snakes encountered in high-use public areas to more remote areas of the park.

Spencer Mountain also has habitat suitable for Timber rattlesnakes. The caretaker on top of the mountain has mentioned sightings of rattlesnakes in the area. This location should be searched and the possible existence of a second disjunct population of timber rattlesnakes here should be verified.

The Gulf Coast spiny softshell turtle (*Apalone spinifera aspera*) is found in Lake Wylie. They have become more difficult to find in recent years (D. Seriff, pers. obs.). This species is listed on the N.C. Animal Watch List (LeGrand and Hall, 1997). In September, 1998, Catawba Riverkeeper D. Lisenby reported finding a dead, gravid female of this species weighing an estimated 35 pounds (D. Lisenby, pers. comm.). This species is also occasionally found in Mountain Island Lake (K. Garrett, pers. comm.).

Rare Amphibians

No amphibian species currently listed on the N.C. Rare Animal or Animal Watch Lists have been documented in Gaston County. It is possible, however, that Four-toed salamanders (*Hemidactylium scutatum*), a species of special concern, exist in sphagnum bog habitats in the county. Gaston is within the range of this species. Areas with bog habitat, like the Bog turtle sites, should be surveyed in February or early March for this salamander species.

The distribution of Gray treefrog (*Hyla versicolor*) in North Carolina is unclear. This species cannot be distinguished with certainty from Cope's Gray treefrog (*Hyla chrysocelis*) in the field. The two species can only be separated by analysis of tape recordings of calls or by examination in the lab. *Hyla versicolor* is listed on the N.C. Animal Watch List.

Rare Fish

Four species of rare fish have been documented in Gaston County waterways. A single sighting record of a River carpsucker (*Carpiodes carpio*) was documented in Lake Wylie in 1979 (Cloutman and Olmsted, 1979). River carpsucker are not native to this part of the state. This sighting may have been a misidentification or it may represent a failed attempt to introduce the animal in this area. The River carpsucker is currently listed as a species of special concern.

A Highfin carpsucker (*Carpiodes velifer*) was found in Lake Wylie prior to 1991. It was not found, however, during aquatic surveys conducted there from in 1992 through 1996

(Citizens' Environmental Advisory Council, 1998.). The Highfin carpsucker is also listed as a species of special concern.

Two rare species of chub historically ranged within the Catawba River system in this area. They are the Santee chub (*Cyprinella zanema*) which is currently listed as significantly rare and the Thicklip chub (*Cyprinella labrosa*) which is on the N.C. Animal Watch List. Both of these species are believed to be extirpated from this region due to the damming of the Catawba River.

Rare Invertebrates

The four butterfly species noted below are currently on the N.C. Animal Watch List. All have been documented in Gaston County (LeGrand and Hall, 1997). The current status of these species needs to be determined.

Brown elfin (*Callophyrs augustinus*)
Confused cloudywing (*Thorybes confusis*)
Cobweb skipper (*Hesperia metea*)
Carolina roadside skipper (*Amblyscirtes carolina*

Five butterfly species listed as being significantly rare have been documented in Gaston County. The current status of these species also needs to be determined. Three of these records are historical records collected from within Gaston County many years ago. If these species still exist, their populations should be monitored. These three species are the Reversed roadside skipper (*Amblyscirtes reversa*), Golden-banded skipper (*Autochton cellus*), and Mottled duskywing (*Erynnis martialis*).

One record of the Long dash butterfly (P*olistes mystic*) is listed as an obscure record because it is well away from its closest known range in the mountains of southern Virginia (LeGrand and Howard, 1998). This record is listed as confirmed, however, on the National Biological Survey internet web site.

The Fourth of July butterfly count conducted at Daniel Stowe Botanical Garden in 1998 (J. Nottke, pers. comm.) recorded a sighting of the significantly rare Southern hairstreak (*Satyrium liparops*). This record, however, is also well out the animal's normal range. Either further documentation or a voucher specimen is needed before this record is accepted.

The county-wide arthropod inventory being conducted by Duane Flynn of the Schiele Museum will be extremely important in clarifying the current status of these rare butterflies as well as the status of other arthropod species.

Three species of millipedes have been recorded in Gaston County. Each of these millipede species is currently on the N.C. Animal Watch List. *Deltotaria lea* was documented in Crowders Mountain State Park at both Crowders Mountain and Kings Pinnacle, during the initial park site survey (Taggert, 1981). *Croatania catawba* and *Pachydesmus crassicutus incursus* were listed as being present in Gaston and/or

Cleveland County by the April 1992 N.C. Natural Heritage program. A current survey should be conducted to relocate these species.

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Chapter 5 – Crowders Mountain State Park

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Topography and Geology

Crowders Mountain State Park currently covers nearly 5,000 acres of land in Gaston and Cleveland counties. The park includes a low ridge and two prominent Piedmont monadnocks, Crowders Mountain and Kings Pinnacle. These peaks are actually remnants of a broad geologic peneplain that weathered away by erosion more than 100 million years ago. These two mountains are the highest points in a resistant ridge that is now called the Kings Mountain range.

Elevations in the park vary from a low point of around 800 feet to highs of 1,625 feet at the top of Crowders Mountain and 1,705 feet at the top of Kings Pinnacle. Topographic relief of over 800 feet occurs in some spots. The heights of cliffs on top of Crowders Mountain vary from around 100 to150 feet. On the top of Kings Pinnacle, the terrain is flatter and the cliff faces are not as steep. Just north of Crowders Mountain is a smaller peak known as Little Mountain. The two peaks are separated by a low topographic saddle of around 1,200 feet. The elevation at the top of Little Mountain is approximately 1,300 feet.

These rock formations are part of the Kings Mountain Belt, a group of rock formations approximately 400-500 million years old. The tops and ridges of these mountains are primarily composed of highly resistant quartzite, a metamorphosed sandstone. Secondary rock types include gneiss and seracite schist.

Kyanite, an aluminum silicate mineral, is abundant here. Frequently found in the form of large, bladed crystals embedded within a gneiss and schist matrix, this valuable mineral is often mined. It is primarily used as a component in heat resistant porcelains that are later used in the manufacture of spark plugs and high temperature brick, and in the production of electrical insulators. The Draytonville conglomerate, a slightly metamorphosed, coarse, quartz pebble conglomerate, is exposed on the southwestern flank of Crowders Mountain (Butler et. al., 1975). In some spots, the dip of the resistant strata of Crowders Mountain is extremely steep, leading regional geologists to designate it as possibly the finest example of a geologic hogback found in the state (Taggert, 1981).

Land Use in This Area Before Formation of the Park

Humans have been active in the park area for many hundreds of years. Archaeological evidence suggests the presence in the area of a prehistoric campsite that was once actively used by Native Americans (*Statewide Plan for the North Carolina Parks System*, 1988). It is believed that a Cherokee trading route once led over the mountain. The battle of Kings Mountain was fought nearby during the American Revolution.

A gold mine called Crowders Mountain mine was opened nearby during the late 1800's. The mountain was even used as a target for artillery practice during World War I (CMSP General Management Plan, 1993).

During the 19th century, agriculture was the primary use of the lands surrounding these mountains. Food crops, cotton, and livestock were raised nearby. Over the years, the forests on the mountain were subject to some logging and to regular disturbance by lightning-induced fires. Some of the lower areas at the base of the slopes were converted to fields.

In the 1890s botanist John Small surveyed both Crowders Mountain and Kings Pinnacle. This is the earliest known botanical survey of this land. He published his findings in two papers in the botanical journal *Torreya* (Barden, 1998; Radford and Martin, 1975). In his writings, Small discusses the presence of the unique Bear oak ecosystem, "the shrubby condition of the normally large forest trees" on the summits, and the presence of various species of both rare and common plants (Barden, 1998).

In the early 20th century, the springs flowing out of the mountain became famous for their supposed health giving and healing properties. A resort known as "All Healing Springs" was built at the base of Crowders Mountain and was visited by thousands of health-conscious tourists. The Linwood Realty Company published a pamphlet in 1926 stating that, "Tradition says the Indians used the healing waters of the springs. But whether that be true or not the white people have known of these qualities for generations."

Years later the resort hotel was converted into a school financed by local cotton mill businessmen. The school later closed and the property went up for sale in 1926, just prior to the onset of the Great Depression. At this point, the natural beauty of Crowders Mountain was first threatened with destruction. Local realtors proposed that the area be developed even though the it was known for its healthful waters and natural beauty. The Linwood Realty Company itself stated in the property advertisement, "On its slopes are a luxuriant growth of mountain forest, rhododendron and azalea comprising much of the shrubbery undergrowth. Crowders Mountain is one of the beauty spots of western North Carolina."

The Linwood Realty pamphlet also noted that the present owners were businessmen who did not care to develop the property as it "rightfully" should be developed, and that the property could be easily subdivided and sold to persons who desired to build summer homes on the mountain. The major part of Crowders Mountain, about 320 acres was offered for development. This development never took place, however, possibly because of the onset of the Great Depression.

Park Acquisition

In the 1970s the unique geology, flora, and fauna of Crowders Mountain faced destruction once again. This time the threat was not of residential summer home development, but from the mining industry. Henry's Knob, in nearby York County, South Carolina, had been recently razed by a kyanite mining operation and exploratory drilling on Crowders Mountain resulted in finds of substantial kyanite deposits. It was a prime target for mining interests.

Local citizens, fearing the permanent loss of the mountains, formed a coalition that petitioned the state to create a state park to preserve the area. The citizen's group was successful in its endeavor and in 1973, the first land for the new park was purchased using a portion of $11.5 million that had been appropriated by the North Carolina legislature for purchasing new park lands. The park officially opened in 1974.

The new park was named Crowders Mountain State Park, for Ulrick Crowder, a German merchant who settled the area in the 1780s (*Statewide Plan for the North Carolina Parks System*, 1988)

It was not until 1977, however, that the summit of Crowders Mountain itself was purchased by the state. The Kings Pinnacle area was added in 1987. A 320-acre natural area on top of Crowders and Little Mountain was later dedicated as a state nature preserve providing even more protection for the natural communities. A 620-acre dedicated nature preserve is proposed for the Kings Pinnacle area to provide protection for its rare plant communities.

In December, 2000, Crowders Mountain State Park purchased an additional 2,061 acres of adjoining land. Approximately 400 acres of this tract are in Gaston County. The remaining portion is in Cleveland County. This purchase was made with funding from the N.C. Natural Heritage Trust Fund and the N.C. State Parks and Recreation Trust Fund.

The new acquisition includes the significant ridge line that runs from the existing Crowders Mountain Park to the South Carolina State line, where it connects with the Kings Mountain State Park and Kings Mountain National Military Park. This provides a corridor for movement of animal species and preserves additional plant communities.

The portion of the new acquisition that is of the most natural heritage significance is located on Juniper Ridge, just southwest of Pinnacle Road. Here, there is a mature Piedmont Monadnock Forest community that shows little or no human disturbance. The area contains an abundance of Dwarf juniper (*Juniperus communis)*, a species of concern for North Carolina.

Flora

Six types of natural plant communities are found at Crowders Mountain State Park. Each of these plant communities occupies subtly different environments that are the result of

variations in substrate, slope, aspect, elevation (temperature), and available moisture. Each type of community harbors a different, often distinct, assembly of dominant plant species. The presence of these diverse natural communities, along with the mix of plant species found in the developed areas of the park, results in an unusually rich diversity of plants for an area located in this area of North Carolina.

The following information lists the types of natural communities found in the park. Each of these community types is described in detail in Chapter 3 of this document. These community type designations follow Schafale and Weakley (1990). Discussion of the distribution of these types is adapted from Edwards (1976) and Barden (1998) and the Crowders Mountain State Park General Management Plan (NCDENR, 1993).

The six types of plant communities in the area include the following:

- Piedmont Monadnock Forest
- Pine-Oak/Heath
- Low Elevation Rocky Summit
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Mesic Mixed Hardwood Forest.

In some areas it is difficult to delineate the specific natural community type present because community types often grade into one another due to the gradient of abiotic factors influencing them.

Higher Elevation Communities

The xeric (extremely dry) forests and rock outcrops in the dedicated nature preserve at the top of Crowders Mountain and Little Mountain represent some of the best examples of Pine-Oak/Heath, Low Elevation Rocky Summit and Piedmont Monadnock Forest community types remaining in North Carolina. For this reason, the N.C. Natural Heritage Program has given the site a B site designation, meaning that it has statewide significance because it contains ecological resources of the "highest quality."

The area around Kings Pinnacle has been proposed as a dedicated nature preserve because it too contains significant examples of these habitat types. The preservation of large buffer areas surrounding each of these peaks is critical to the preservation of their biological integrity for the future.

The Low Elevation Rocky Summit community is the most unique plant community found in the park. Examples of this community type are found on Crowders Mountain, Little Mountain, and Kings Pinnacle. This community contains a relict population of Bear oak (*Quercus ilicifolia*). A relect is an organism or species surviving from an earlier time, in an environment that has undergone considerable change. This Bear oak population is at the southern edge of its known range in North America and it is most likely genetically significant (Barden, 1998). Stunted Virginia pine, Catawba rhododendron, and Mountain laurel are also common in some patches here.

In addition to the Bear oaks, other rare plants documented in the Low Elevation Rocky Summit communities on Crowders Mountain, Little Mountain and Kings Pinnacle include the following:

- Bradley's spleenwort
- Ground juniper,
- Kings Mountain liatris
- Biltmore carrion-flower
- Appalachian golden-banner
- Silverling
- Piedmont indigo bush.

This type of plant community requires periodic disturbance by fire in order to thrive. Past suppression of natural fires in the area has resulted in the decline of the overall integrity of the habitat (Barden, 1998). Active management with prescribed burns will be needed in order to maintain this rare ecosystem. The Low Elevation Rocky Summit community grades into Piedmont Monadnock forest and Pine Oak/Heath communities.

Piedmont Monadnock Forest communities exist on Crowders Mountain, Little Mountain, and Kings Pinnacle. The dominant canopy tree is Chestnut oak. Other trees found interspersed in this community include Scarlet oak, Blackjack oak, Black oak, Mockernut hickory, Pignut hickory, Virginia pine and some Black gum. Several American chestnut tree stump sprouts and small trees can still be found in this habitat and also nearby in some of the more exposed Pine-Oak/Heath and Low Elevation Rocky Summit areas. Numerous specimens as large as six inches in diameter were still found as recently as the early 1980's. A tall (~15 ft./ 8 in. diameter) American chestnut sapling bearing many prickly fruit burs is still present on Kings Pinnacle, but it is obvious that chestnut blight (*Endothia parasitica*) is already affecting the bark on the trunk of this tree.

Areas of Pine-Oak/Heath assemblages also occur on each of the three mountain summits. These areas are best identified by the presence of Mountain laurel, Catawba rhododendron, Sourwood, Chestnut oak, Virginia pine and some persistent American chestnut. Mountain witch-alder and Black huckleberry have been documented here. Bear oak is also present in this fire-dependent type of community.

Down Slope Communities

The community types described above grade into Dry Oak-Hickory Forest and Dry-Mesic Oak-Hickory Forest communities as you move down slope. White oak, Scarlet oak, Black oak, Blackjack oak, Virginia pine, Short-leaf pine, and Southern red oak, become dominant canopy trees in conjunction with or replacing Chestnut oak in the Dry Oak-Hickory Forest.

In the Dry-Mesic Oak-Hickory Forest communities, White oak, Northern red oak, Shagbark hickory, and the fast-growing Tulip poplar, Sweetgum and Red maple species are dominant. Most of these areas appear to have been high-graded (the best quality trees cut and the poorer trees left to grow) in the years before the park was created.

Ravines, stream banks, steep north facing slopes, and the lower, wetter natural areas of the park harbor Mesic Mixed Hardwood Forest communities. American beech, Tulip poplar, Northern red oak, Red maple, and Flowering dogwood predominate here. Trout lily can be found blooming above the banks of some streams in the early spring. A lush groundcover of ferns and herbaceous plants carpet some of the lowest areas throughout spring and summer.

In the developed areas of the park, natural forest community types have been heavily altered. Many areas were once converted into fields. This disturbance aided the spread of a number of exotic plant species. These non-native plants have thrived and now are out competing with native plant species in many areas. One of the most pervasive of these invasive exotics is Microstegium, a grass that is now abundant along streamsides and in wet areas in the lower elevations of the park. Other exotic species profoundly affecting the park flora include: Autumn olive, Privet, Japanese honeysuckle, Mimosa and Kudzu. A comprehensive exotic plant control program would help prevent further spread of these plants throughout the park.

Areas that were fields in the 1970s have been allowed to slowly convert into late successional old field habitats where Virginia pine, Short-leaf pine, Sweetgum, Winged elm, Eastern red cedar and Red maple now predominate. These developed areas, altered areas and forest edges harbor many common and weedy plant species not found in the park's natural communities.

Fauna

Habitats preserved at Crowders Mountain State Park support a good diversity of wildlife species. Some of the animals documented in the park have not been found elsewhere in Gaston County. Twenty-three species of mammals, one hundred sixty five species of birds, twenty nine species of reptiles, fourteen species of amphibians, and at least forty species of butterflies are documented within the boundaries of the park

Natural Habitats

There are two primary types of wildlife habitat found in the natural areas of the park. These are the Upland Forest/Rock Outcrop, and the Mesic Mixed Hardwood Forest. These types of habitats are described in detail in Chapter 4 of this document. Many of the rare or uncommon animal species rely primarily on these forested or rock outcrop habitats. Large, unfragmented examples of these wildlife habitat types, however, are not common in the county. The preservation of these park areas is therefore important to the long term existence of some these animal species within Gaston County.

Animal Species

Examples of some animal species found in the park habitats include the following:

- Bobcat,
- Southern flying squirrel
- Mink

- Wild turkey
- Queen snake (along streambanks)
- Copperhead,
- Ringneck snake
- Southern two-lined salamander
- Gemmed saytr
- Common wood nymph.

Bird Species

Breeding bird species in the park include the following:

- Broad-winged hawk
- Pileated woodpecker
- Yellow-billed cuckoo
- Ovenbird
- Rred-eyed vireo
- Scarlet tanager
- Louisiana waterthrush
- Black and white warbler
- Hairy woodpecker

About 120 of the 165 five bird species documented in the park are not permanent year-round residents. These birds use the park's natural resources as vital stopover habitat during migration, or for breeding, or wintering only. Over 25 species of neotropical migrant warblers move through each spring and fall. During fall migration, migrant raptors such as ospreys, merlin, broad-winged hawks, sharp-shinned hawks, Cooper's hawks, and Northern harriers use updrafts created from the presence of the mountain peaks.

Wintering bird species that rely on the forests include the brown creeper, winter wren, red-breasted nuthatch, yellow-bellied sapsucker, dark-eyed juncos, golden and ruby-crowned kinglets. Occasionally, blue-headed vireos and irruptive species like pine siskins, evening grosbeaks and purple finches are sighted.

Migratory Invertebrates

Large numbers of monarch butterflies have been documented in the park. These are seen using the rock outcrops and mountaintop trees for night time resting during the fall migration (Burney, 1974).

Rare Animal Species

Several rare animal species have been found in the park's natural areas. Both Long-tailed weasels and Little brown bats have been documented. Each of these mammals is listed on the N.C. Animal Watch List (LeGrand and Hall, 1997). Black vultures, also on the Watch List, have nested for many years on Buzzard's Roost and on Kings Pinnacle. Blue-headed (formerly Solitary) vireos are believed to have nested in the park in the mid-

nineteen eighties (T. Piephoff, pers. comm.). This vireo is a very uncommon breeder in this part of the Piedmont. The current nesting status of this species here is unknown.

Both Timber rattlesnake and Carolina pygmy rattlesnake populations have been documented in the park. The Timber rattlesnake population is apparently stable while the status of the significantly rare Carolina pygmy rattlesnake population is unknown. It is possible that the population of this small rattlesnake has been extirpated from the park.

A significantly rare butterflyspecies , the Long dash (*Polistes mystic*), has been recorded in Crowders Mountain State Park (CMSP General Management Plan, 1993 and the National Biological Survey). A rare millipede, *Deltotaria lea*, was documented in the park in the late 1970s. It is also currently listed on the N.C. Animal Watch List. See Chapter 4 of this document for more details on rare animal species in Gaston County.

Altered and Developed Areas

Animals associated with Forest-Edge Habitat and Open Habitat, as described in the Chapter 4 of this document, are found in the developed areas of the park and in the forest edge zones along the park boundaries. These habitats, including the park's manmade pond, support many of the park's more ubiquitous wildlife species. Consequently, these are the areas of the park where wild animals are most often seen.

Mammal species common in these habitats include: White-tailed deer, Opossum, Gray fox and occasionally Red fox, Eastern cottontail, Eastern chipmunk, Gray squirrel, White-footed mouse, and Raccoon. Several reptile and amphibian species are commonly found in and around the pond or in nearby wet areas and adjacent feeder streams. These include Eastern painted turtle, Yellowbelly slider, Snapping turtle, Mud turtle, Musk turtle, Northern watersnake, Five-lined skink, Green anole, American toad, Fowler's toad, Bullfrog, Green frog, Upland chorus frog, Spring peeper, Northern cricket frog, Southern leopard frog and Northern dusky salamander.

Many common bird species, including Northern cardinal, Carolina wren, Tufted titmouse and Carolina chickadee use the edge habitat around the pond and visitor center for nesting. Sightings of the Northern bobwhite, an edge species that is declining in many areas of the state, have been increasing at Crowders Mountain State Park during the past few years (D. Sarver, pers. comm.). Breeding was confirmed in 1998 when young were observed.

Little is known about the native fish and macro-invertebrate animal species inhabiting the park's streams. A detailed survey should be performed to document the creatures found here. The fish in the park's pond are common, non-native, stocked game fish species.

As part of a countywide arthropod survey, Duane Flynn of the Schiele Museum has constructed a number of pitfall traps in the park to collect arthropods. Other collection techniques are being used as part of this survey as well. Data collected on species occurrence will undoubtedly provide many interesting surprises and a wealth of

previously undocumented information about invertebrate species in the park. Beetle, dragonfly and moth species may prove to be of particular interest.

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Chapter 6 - Preservation Efforts and Options

Written by Dr. Jim Matthews, HARP, and Kimberley Lough, N.C. Cooperative Extension

Preservation Efforts

Several natural features of Gaston County make it unique for the Piedmont and should be considered in future Natural Heritage inventory work. These features include those noted below.

- The monadnocks and associated communities need to be preserved. Additional field work is needed to completely catalog the organisms in these areas.
- The relationship of flora in the monadnock areas to the montane flora should be recognized, so that biologists pursuing field work will be on the lookout for these species.
- The importance of the county as a center for the natural occurrence of *Magnolia macrophylla* could, and should be, recognized by the county from both preservation and public relations aspects. Through the work of the Daniel Stowe Botanical Gardens, Gaston County is becoming a well-known botanical center, and the recognition of the Bigleaf magnolia can be an asset.

Gaston County has a diverse and interesting series of habitats and species that provide a reason for considering protection measures. Development continues, however, and there are no organizations in the county that are oriented specifically toward protection.

The Catawba Lands Conservancy is a regional non-profit conservation organization. It is important that strong ties continue between Gaston County government bodies, the Gaston QNRC, and the Catawba Lands Conservancy (or other such groups) to protect areas before they are destroyed. Ignorance could destroy such special natural features as the monadnocks and the last remaining populations of several species of plants or animals. It is vital to locate these areas, and be aware of their special features and important populations of organisms.

The work of the Natural Heritage inventory should continue, and efforts should be made to work toward protection of the biological diversity still present in the county. Because the quality of a habitat determines the long-range survival of the species it supports, it is more important to preserve whole, intact habitats than to save individual species. Moving plants to safe sites, for example, is the last resort in conservation efforts, and in many instances these plants cannot survive in an artificial environment.

Residents of Gaston County who are interested in nature and conservation are encouraged to contact the Gaston County QNRC or the Catawba Lands Conservancy in Charlotte if a question arises regarding a potential area or species of concern.

Progress

It is important to recognize that efforts are being made and some successes are evident. These include the following:

- Crowders Mountain State Park, has recently been expanded toward the southwest to include the Pinnacle Road site. The park now totals approximately 5,000 acres. The new acquisition provides a corridor connecting Crowders Mountain State Park with the Kings Mountain State Park and the Kings Mountain National Military Park.

- The conservation easement obtained by the Catawba Lands Conservancy for the Forney Rankin/Redlair Preserve. This area consists a 630-acre tract along the east bank of the South Fork River. The agreement preserves three community types: the Mesic Mixed Hardwood Forest (with an excellent representation of *Magnolia macrophylla*), the Dry Mesic Oak-Hickory Forest, and the Dry Oak-Hickory Forest on the ridge tops. Although some areas of the preserve have been disturbed, many of the slopes have trees with a diameter of more than 24 inches.

- Preservation discussions that are in process with the owner of the Stagecoach Road Granitic Outcrop and Wetland. This site is the largest relatively undisturbed outcrop of its type known in the southern Piedmont of North Carolina, west of Rowan County. Hopefully, this outcrop and the wetland at the base of the outcrop, along with a sufficient buffer, can be preserved.

- Discussions that are also in progress with other landowners. An example is the Laurel Hill Nursery on Spencer Mountain. This site has relatively undisturbed vegetation on north-facing slopes above Long Creek and a good population of *Magnolia macrophylla*.

- The City of Gastonia is discussing preservation options for a portion of the South Pasour Mountain monadnock. The Catawba Lands Conservancy is discussing preservation options with other interested landowners along the South Fork River and its tributaries.

Assistance for Landowners

Landowners interested in preserving or restoring the natural heritage of their property have many options. The following information provides an overview of some commonly recognized possibilities. See Appendix 1 for other resources and agencies available to landowners.

Land Trusts

Land trusts are private, nonprofit conservation organizations that help landowners to protect their land using tools such as agricultural conservation easements, purchase of development rights, and life estates. Before making any estate planning decisions, a landowner should consult his or her attorney, tax adviser or estate planner. The land trust can work with the landowners and their advisers to find the tool best suited for the situation involved.

North Carolina has some two dozen local and regional land trusts, and new trusts continue to form. The Conservation Trust for North Carolina (CTNC), for example, is a statewide land trust dedicated to educating citizens. It also supports other land trusts in efforts to protect resources by referring landowner to land trusts in this area. See Appendix 1 for a list of other land trusts currently working in Gaston County.

Public Agencies

Gaston Natural Resources Conservation District (NRCD) and the Natural Resources Conservation Service (NRCS) are able to arrange conservation easements and other farm conservation management agreements. Landowners can contact these agencies or the N.C. Cooperative Extension for further program information. Also, the Gaston County Quality of Natural Resources Commission (QNRC) educates and refers Gaston County citizens regarding recognized private and non-profit agencies and resources.

Conservation Easements

A conservation easement is a document in which the landowner does the following:

- Agrees to a series of restrictions on certain uses and development rights on his or her land.
- Grants certain affirmative rights, including the right to enforce the restrictions, to a second party, usually a non-profit conservation organization or a government agency involved in park or natural area protection.

Conservation easements are tailored to the particular characteristics of the land and interests of the landowner. Generally, the landowner continues to manage the land. Exceptions occur if there are special management needs such as controlled burns or removal of non-native species. In such cases, the second party is either authorized to be directly involved in management and must be consulted on, or grant approval for, management undertaken by the landowner.

Typically, conservation easements are granted to the second party at no cost. However, administrative costs for holding and monitoring the easement property, and possibly management costs, will be incurred by the grantor of the easement. Thus, grantors are advised to establish an endowment sufficient to generate income for estimated annual expenses.

The following tax incentives apply to grantors of conservation easements.

Federal Income Tax Incentives
Donations of conservation easements that qualify as conservation contributions to qualified holders under Section 170 (h) of the Internal Revenue Code are deductible itemized contributions.

State Income Tax Incentives
The North Carolina taxing scheme follows the Internal Revenue Code. Thus, donations of conservation easements are also eligible for itemized deductions against North Carolina taxable income.

Federal and State Estate Tax Incentives
Donations of easements also operate as a significant estate planning tool by reducing the value of the property. Property can then be passed from one generation to the next with decreased estate tax liability.

State Property Tax Incentives
Tax assessors in North Carolina counties are required "to consider" value reductions that occur when property is dedicated to nature preserve. Landowners should apply for a change in the tax assessment of land placed under conservation easement. However, the county tax assessor is not bound by the appraisal of the owner, even if the federal tax authorities have allowed an income tax deduction in the amount of the appraisal.

Federal Programs

The following Federal programs are potential options for landowners wishing to preserve land.

Conservation Reserve Program (CRP)
CRP allows farmers to enroll large or small acreage for a specified contract period. During this period, farmers cease production and establish covers of grass, trees or water for preservation of soil, water and wildlife. Farmers receive a rental fee, 50% cost share for conservation practices and 25% of the cost for restoring wetlands in return. *{U.S. Department of Agriculture (USDA)}*

Environmental Quality Incentives (EQUIP)
EQUIP focuses on conserving and enhancing important soils, water and other natural resources often found on farms. EQUIP participants receive incentive payments for up to three years for improved land management practices, as well as up to 75% cost share for conservation practices. *{USDA}*

Wildlife Habitat Incentives Program (WHIP)
WHIP protects free-ranging wildlife habitat with a focus on field margins and riparian buffers. Money available is based on North Carolina's WHIP plans and national, regional and state habitat priorities. WHIP provides up to $10,000, or 75% of the average

cost of wildlife-enhancing activities, for each five to ten year contract. *{Gaston NRCD, NRCS, NC Cooperative Extension, Farm Service Agency}*

Wetlands Reserve Program (WRP)
WRP provides cost-share funding to restore wetlands and riparian areas. The following enrollment options are available:

1. Permanent conservation easements with payment of 100% of agricultural value or established area cap, 100% of restoration costs paid by USDA

2. 30-year conservation easements with typical payment of 75% of agricultural value or area cap, 75% of restoration costs paid by USDA

3. Restoration cost-share agreement with no incentive payment and 75% of restoration costs paid by USDA
   {USDA, NRCS}

State Programs

The following state programs are available to qualified landowners:

Conservation Reserve Enhancement Program (CREP)
CREP focuses on protection and restoration of stream buffers on agricultural lands. Rent is paid for land enrolled in 10-year, 15-year, 30-year and permanent conservation easements. Implementation of best management practices may be cost shared, depending on the contract's length. *{USDA, Gaston NRCD}*

North Carolina Agricultural Cost share Program
This program reimburses up to 75% of the average cost of implementing best management practices. Practices include vegetative, structural and management systems. *{Division of Soil and Water Resources, Gaston NRCD}*

Section 6 References

"An Overview of Conservation Easements." 1992. Prepared for N.C. Natural Heritage Foundation, Seminar for Land Trusts. N.C. Botanical Garden. Chapel Hill, NC.

Protecting Your Legacy: Conservation Options for Agricultural Lands. Conservation Trust for North Carolina, in partnership with N.C. Department of Agriculture and Consumer Services. Raleigh, NC.

Chapter 7 – Site Descriptions for A and B Sites

Site Examination

During the Gaston County Natural Heritage Inventory project, 111 county sites were examined. Determination of site biological significance draws on the raw data collected from field surveys and the experience of professional biologists. Site significance is primarily influenced by the following:

- quality, condition, and rarity of natural community types and rare species present
- size of the site
- ecological integrity or long-term viability of the site

Other considerations may include overall floral and animal diversity, presence of species that are uncommon or that are ecological indicators of special habitats, potential animal habitat, and degree of connectivity with other natural areas. The biological significance rating is meant to be as objective as possible. Ownership or prospects for conservation of a site do not influence the evaluation of site significance.

Site Significance

Site biological significance has four designated levels. The Gaston County Natural Heritage Inventory evaluated the 111 sites included in the study and created three categories based on those levels. The four designated levels include the following:

- **National** – The natural area is considered to be of national importance. The site is one of the best (in the top 5 or 6) natural areas of its kind in the country. It contains an exemplary natural community or rare species population. Such a site is usually in relatively undisturbed condition and is often extensive in size, or the population sizes of the significant plants and animals present are large and healthy. Such a natural area is given an extremely high priority for protection.

- **State** – The natural area is considered to be of statewide importance. The site contains one of the best (in the top 5 or 6) natural areas of its kind in the state and contains an exemplary natural community or rare species population. However, there are other natural areas with similar ecological features that are more significant elsewhere in the state or in the country. Usually, the natural communities present are relatively undisturbed and the populations of the rare species present are fairly large. Such a natural area is given a high priority for protection.

- **Regional** – The natural area is considered to be of regional (the county where the site is located and all bordering counties) importance. The site contains one of the best (in the top 5 or 6) natural areas of its kind in the region and features an exemplary natural community or rare species population. For this report, a site of regional importance is one of the most significant sites in the four counties of

Cleveland, Lincoln, Mecklenburg, and Gaston. There are other natural areas with similar ecological features that are more significant elsewhere in the Piedmont of North Carolina (or elsewhere in the region if they are of National or State significance). Such a natural area is given a high priority for protection.

- **County** – The natural area is considered to be of county importance. The site contains one of the best (in the top 5 or 6) natural areas of its kind in the county and features an exemplary natural community or rare species population. However, there are other natural areas with similar ecological features that are more significant elsewhere in the county or in surrounding counties. Also included are extensive sites with only fair to moderate quality forests but which may be important for providing habitat for wildlife populations. Such a natural area is given a moderate priority for protection.

The Gaston County Natural Heritage Inventory designated A, B, and C site categories according to the following criteria:

- A sites are those that have national, state or regional significance
- B sites are those with county significance
- C sites are not judged to be significant at this time

The inventory resulted in the designation of 12 sites in category A, 25 sites in category B and 74 sites in category C. The following tables list the A and B sites. Detailed information for each of these sites is contained in this chapter. The map in Figure 10 illustrates site locations.

A Sites

The following table lists the Gaston Natural Heritage sites in the A category (National, State or Regional significance).

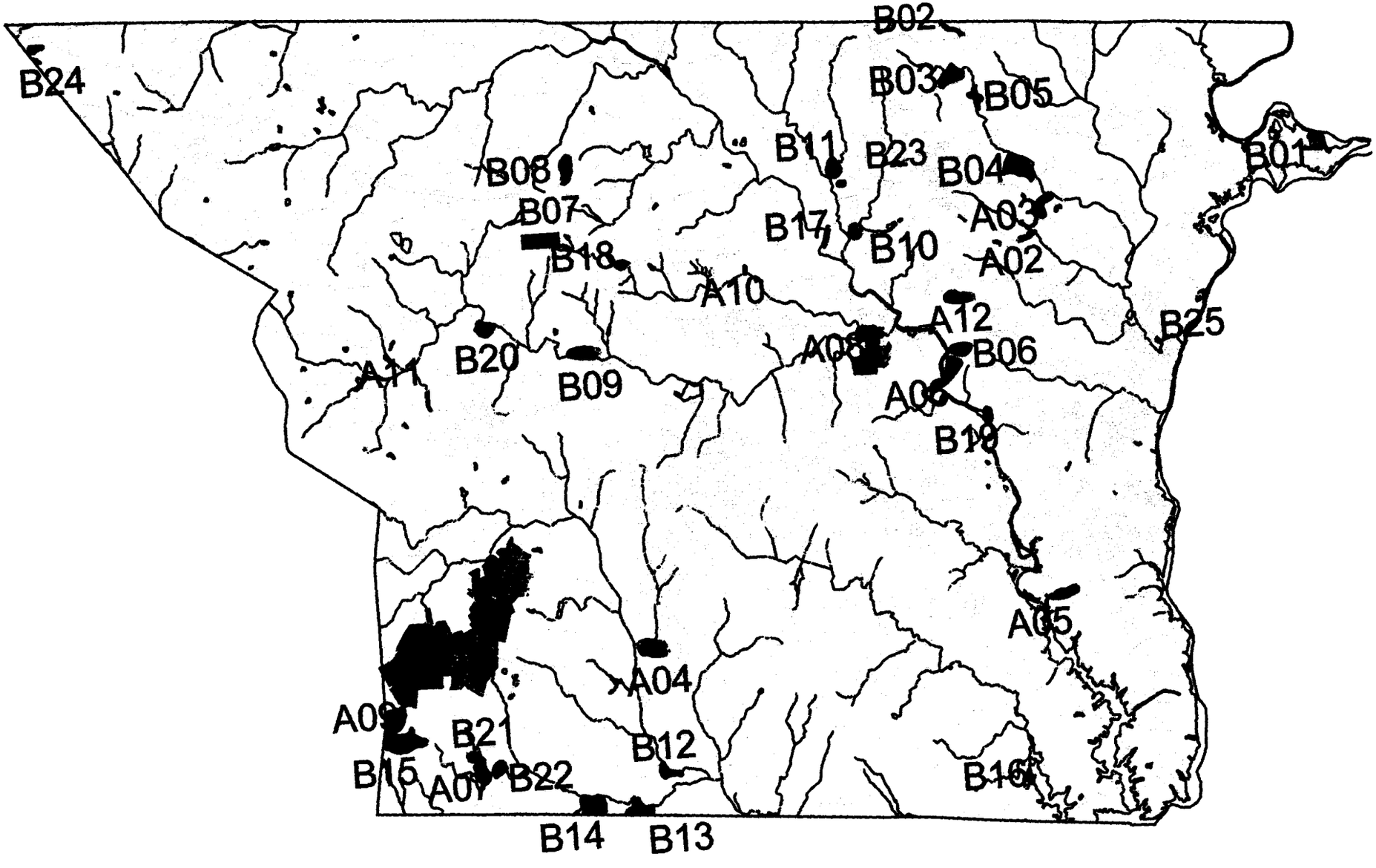
SITE NUMBER	SITE LOCATION
A 01	Crowders Mountain State Park
A 02	Twin Brooks – Stanley Basic Forest
A 03	Richard Rankin Complex
A 04	Stagecoach Road Granitic Outcrop and Wetland
A 05	Armstrong Ford
A 06	Jean Rankin Forest
A 07	Kenneth Oates Farm Forest (Area B)
A 08	Laurel Hill Nursery Forest
A 09	Pinnacle Road
A 10	Friday Sites # 1-1 and 1-2 (primary site and annex)
A 11	Jenkins Site
A 12	Forney Rankin/Redlair Preserve

B Sites

The following table lists the Gaston Natural Heritage sites in the B category (County significance).

SITE NUMBER	SITE LOCATION
B 01	Riverbend Peninsula Forest
B 02	Saddler Road
B 03	Airport Road East
B 04	Rhyne Farm
B 05	Stanley Creek
B 06	Spencer Mountain Dam
B 07	South Pasour Mountain – Piedmont Monadnock Forest
B 08	Middle Pasour Mountain
B 09	Long Creek Gauging Station
B 10	Mauney Creek
B 11	Mike Moore Hill
B 12	Penegar, Gastonia South
B 13	Ferguson Ridge
B 14	Ferguson's Knob
B 15	Unity Church Road
B 16	Catawba Cove
B 17	Rhyne Bluffs
B 18	Thornburg Shoals Granitic Flatrock, Bottomland Forest
B 19	Sumner Road
B 20	Grant Hill
B 21	Kenneth Oates Farm Forest (Area A)
B 22	Kenneth Oates Farm Forest (Area C)
B 23	Jack Moore Forest
B 24	Falston Road
B 25	Johnson Creek and Side Catawba

Gaston County Significant Natural Heritage Site



SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: A01 **NAME OF SITE:** Crowders Mountain State Park

Size: 3,000 acres **Quadrangle:** Kings Mtn.
Province: PIEDMONT **Watershed:** Crowders Creek

Site Significance:
STATE (Excellent plant communities and a large area.)

Special Status Species (attach EORs): Asplenium bradleyi, Juniperus communis var. depressa, Smilax biltmoreana, Quercus ilicifolia, Fothergilla major, Thermopsis mollis, Helianthus laevigatus, Amorpha schwerini

Potential for other Special Status Species:

Other noteworthy species or features present: Asplenium montanum, Paronychia argyrocoma, Rhododendron minus, Liatris regimontis, Vaccinium constablaei, Leiophyllum buxifolium, Xerophyllum asphodeloides

PHYSICAL DESCRIPTION

A large topographically, botanically and zoologically diverse area.

Locations and Directions:

Main entrance is off Sparrow Springs Rd.

Landscape Description:

Aspect: N, S, E, W **Slope:** All **Elevation (ft above MSL):** 800-1705

Topographic Position: Crest, Upper/Mid/Lower Slopes, Alluvial Flat

Hydrology: Terrestrial **Moisture:** Mesic, Dry Mesic, Xeric

Geology: Kings Mountain Belt - Quartzite, metamorphosed sandstone, gneiss, biotite-muscovite schist

Soils: Uwharrie stony loam, Tatum gravelly loam

Comments on Physical Description:

BIOLOGICAL DESCRIPTION

A. Piedmont Monadnock Forest, Pine-Oak/Heath, Low Elevation Rocky Summit, Dry Oak-Hickory Forest, Dry-Mesic Oak-Hickory Forest, Mesic Mixed Hardwood Forest.
B. Open rock outcrops to varying amounts of stunted canopy trees to forests with well-developed canopy, subcanopy, shrub and herb layers.
C. Dominants vary according to habitat.
D. Crowders Mountain (including Kings Pinnacle) rises from the surrounding Piedmont landscape as part of the Kings Mountain Range. Many of the surrounding habitats of past similarity have been destroyed by mining or development.
E. Several communities (Piedmont Monadnock Forest, Pine-Oak/Heath and Low Elevation Rocky Summit) are some of the best preserved in NC.
F. 3,000 acres.

Site Integrity: Excellent to disturbed **Fire regime:** Past, recent and localized but now being planned as part of management.

Maximum DBH of canopy trees: Habitat specific **Average DBH of canopy trees:** Habitat specific

Logged (y/n): Yes **Stream channelized (y/n):** No

Even-aged canopy (y/n): No **Dredging/filling (y/n):** No

Non-native / weedy species present (y/n): Yes **Understory cleared (y/n):** No

Ditched/drained (y/n): Yes **Grazing (y/n):** No

Comments on Biological Description:

Many observers have contributed data. Don Seriff compiled as much information as could be located.

ADJACENT LAND USE: Agriculture, Housing, Mining

PROTECTION / MANAGEMENT NEEDS:

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: A01 **NAME OF SITE:** Crowders Mountain State Park

Use fire in Bear Oak habitats (See Barden, 1998).

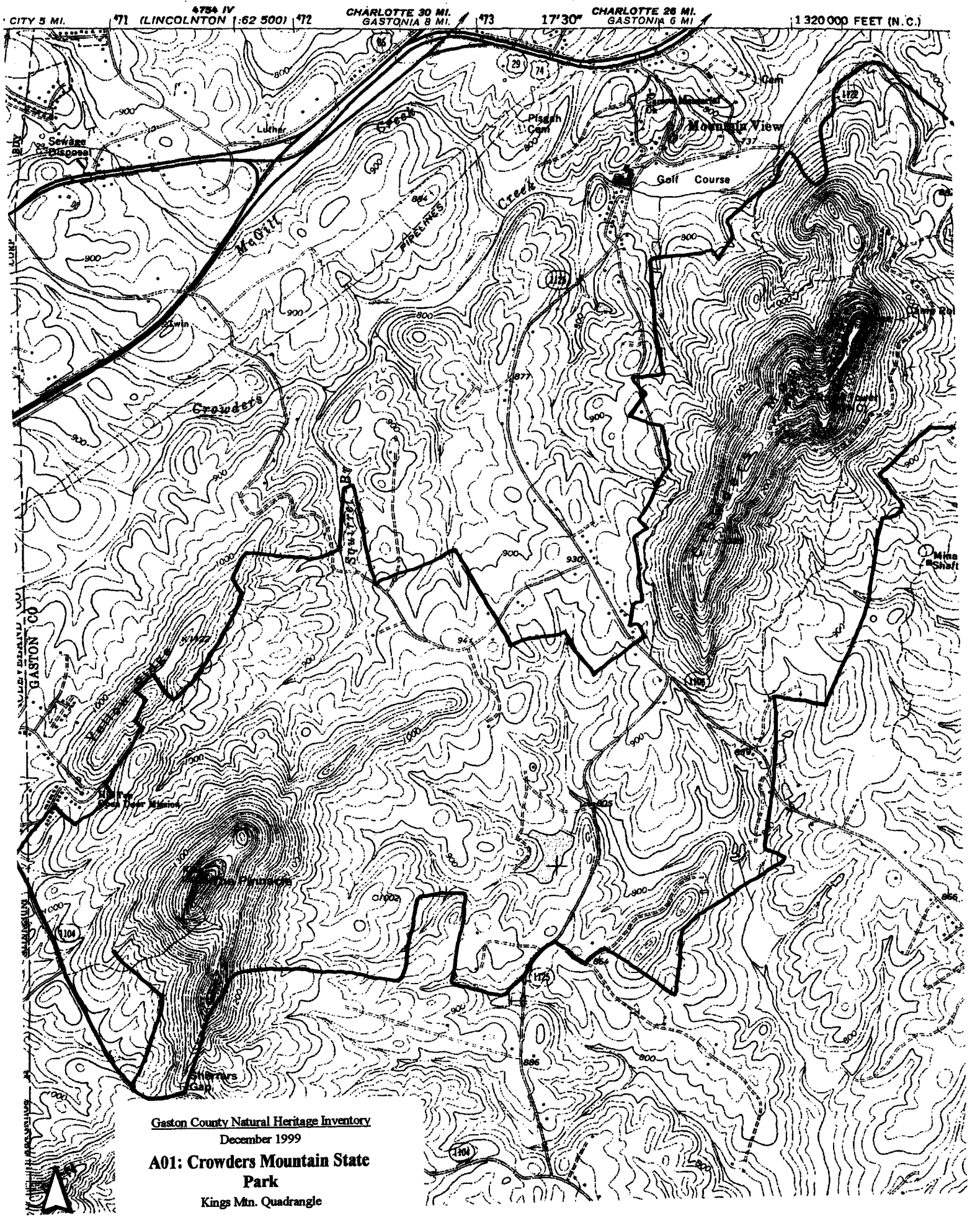
DOCUMENTATION:
UNCC

PLANT SPECIES LIST:
See Appendices 5 and 6.

ANIMAL SPECIES LIST:
See Chapter 4

DATE: 16-Mar-99 **UPDATES:**

OWNER NAME: NC State Parks and Recreation



Gaston County Natural Heritage Inventory

December 1999

A01: Crowders Mountain State Park

Kings Mtn. Quadrangle

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: A02 **NAME OF SITE:** Twin Brooks - Stanley Basic Forest

Size: 70 acres **Quadrangle:** Mt. Holly
Province: PIEDMONT **Watershed:** Dutchmans Creek

Site Significance:
REGIONAL (Excellent, diverse Basic Forest.)

Special Status Species (attach EORs): Magnolia macrophylla

Potential for other Special Status Species: Nestronia was not present in this study area but does occur along NC 27.

Other noteworthy species or features present: Asimina parviflora, Styrax, Itea virginica

PHYSICAL DESCRIPTION

Site includes the slopes on both sides of the tributary.

Locations and Directions:

Highway 27 between Stanley and Mt. Holly.

Landscape Description:

Aspect: N **Slope:** 0-10% **Elevation (ft above MSL):** 620-740

Topographic Position: Upper/Mid/Lower Slopes, Upland Flat

Hydrology: Terrestrial **Moisture:** Mesic to Xeric

Geology: Mgd - Metamorphosed quartz diorite

Soils: Winnsboro Series-WnB

Comments on Physical Description:

Located on a first order tributary.

BIOLOGICAL DESCRIPTION

A. Basic Mesic Forest (mafic variant).
B. Canopy, subcanopy, shrub and herb layers are well developed, with an excellent diversity of species at all levels.
C. Mixed oak and hickory species dominate the canopy, with Magnolia macrophylla and transgressives of the canopy species and the subcanopy. The shrub layer is diverse and includes Asimina parviflora, Itea virginica and Styrax americana. The herb layer is also very diverse.
D. It grades into the floodplain of Stanley Creek.
E. The site has high integrity and high species diversity.
F. ca. 23 acres.

Site Integrity: Good **Fire regime:**

Maximum DBH of canopy trees: 24" **Average DBH of canopy trees:** 19"

Logged (y/n): No **Stream channelized (y/n):** No

Even-aged canopy (y/n): No **Dredging/filling (y/n):** No

Non-native / weedy species present (y/n): No **Understory cleared (y/n):** No

Ditched/drained (y/n): No **Grazing (y/n):** No

Comments on Biological Description:

Originally taken from Natural Heritage Survey by S. Oakley and H. Legrand. This site small in size but rich in botanical diversity.

ADJACENT LAND USE: Industrial Park

PROTECTION / MANAGEMENT NEEDS:

Needs to be protected. Located on private industrial land that might not be disturbed for awhile.

DOCUMENTATION:

PLANT SPECIES LIST:

CANOPY: Quercus rubra, Q. alba, Liquidambar styraciflua, Liriodendron tulipifera, Fagus grandifolia, Carya

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

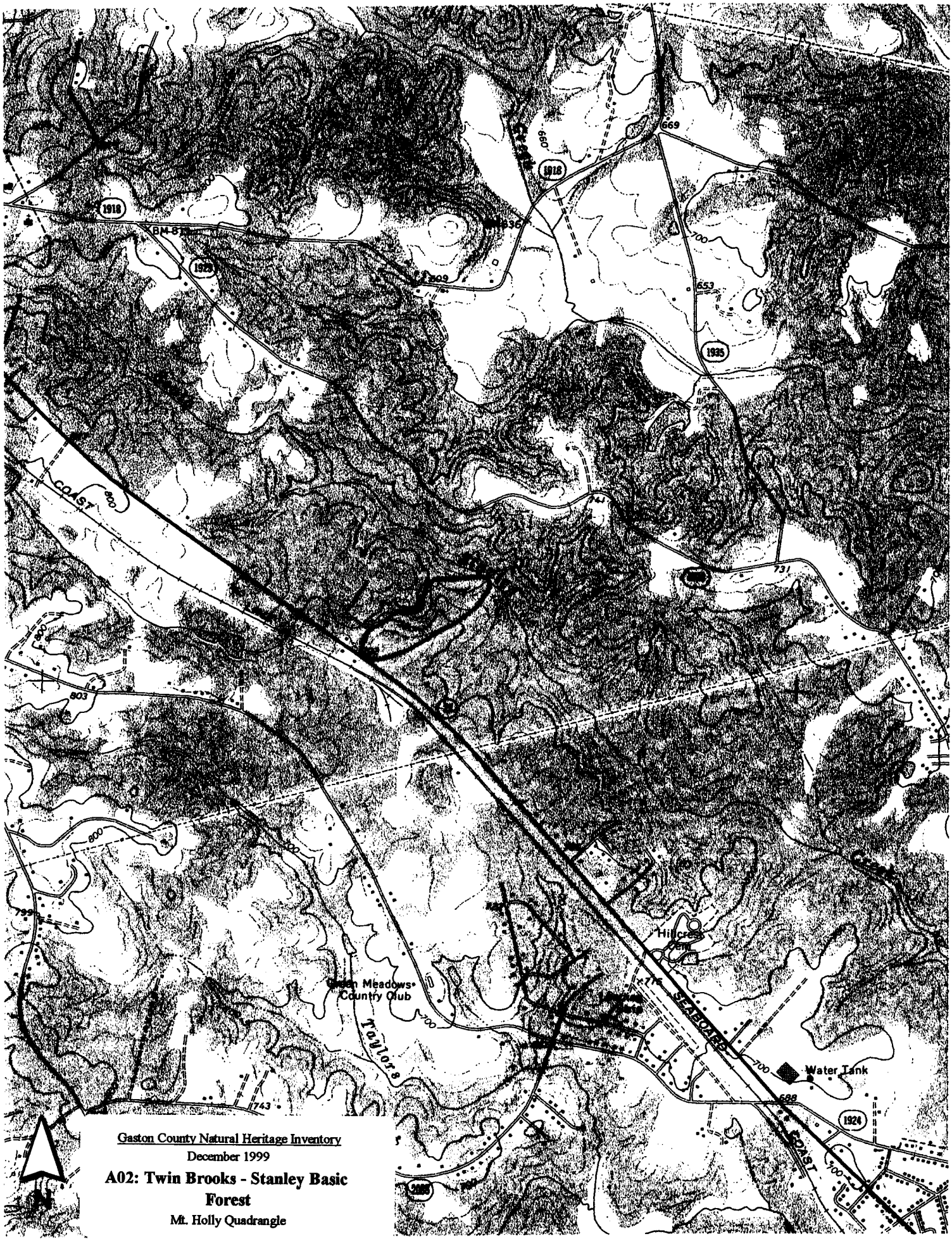
SITE NUMBER: A02 **NAME OF SITE:** Twin Brooks - Stanley Basic Forest

tomentosa, C. glabra, Fraxinus americana.
SUBCANOPY: Magnolia macrophylla, Ilex opaca, Morus rubra, Nyssa sylvatica, Cornus florida, Tilia americana, Ulmus alata, Acer rubrum.
SHRUBS: Amelanchier spp., Arundinaria gigantea, Asimina parviflora, A. triloba, Carpinus caroliniana, Castanea pumilla, Celtis tenuifolia, Ceanothus americanus, Chionanthus virginicus, Cornus amomum, Corylus americana, Crataegus spp., Hamamelis virginiana, Ilex decidua, Itea virginica, Lindera benzoin, Oxydendrum arboreum, Rhododendron nudiflorum, Sambucus canadensis, Sassafras albidum, Styrax americana, Vaccinium stamineum, Viburnum prunifolium, Xanthorhiza simplicissima.
VINES: Anisostichus capreolata, Dioscorea villosa, Parthenocissus quinquefolia, Toxicodendron radicans, Vitis rotundifolia.
HERBS: Amianthium muscaetoxicum, Amsonia tabernaemontana var. tabernaemontana, Anemone quinquefolia, Anthoxanthum odoratum, Arisaema triphyllum, Aristolochia serpentaria, Aureolaria virginiana, Boehmeria cylindrica, Chamaelirium luteum, Chimaphila maculata, Chrysogonum virginianum, Cimicifuga racemosa, Clematis ochroleuca, Collinsonia canadensis, Coreopsis auriculata, Cynoglossum virginianum, Epifagus virginiana, Eupatorium maculatum, Gillenia trifoliata, Goodyera pubescens, Hepatica americana, Heuchera americana, Hieracium venosum, Houstonia caerulea, H. purpurea, Hypericum tubulosum, Hypoxis hirsuta, Iris cristata, Ligusticum canadense, Lobelia cardinalis, Lysimachia quadrifolia, Medeola virginiana, Mitchella repens, Obolaria virginica, Oxalis violacea, Podophyllum peltatum, Polygonatum biflorum, Rudbeckia laciniata, Salvia lyrata, Sanguinaria canadensis, Sanicula spp., Scutellaria spp., Smilacina racemosa, Smilax herbacea, Thalictrum polygamum, T. thalictroides, Thaspium barbinode, Tipularia discolor, Trillium catesbaei, Uvularia perfoliata, Viola hastata.
FERNS: Adiantum pedatum, Asplenium platyneuron, Athyrium aspleniodes, Botrychuim virginianum, Osmunda regalis, Polystichum acrostichoides, Thelypteris hexagonoptera.

ANIMAL SPECIES LIST:

DATE: 04-Nov-92 **UPDATES:** 13-May-96, 01-May-96, 24-Sep-97

OWNER NAME: Private



Gaston County Natural Heritage Inventory

December 1999

A02: Twin Brooks - Stanley Basic Forest

Mt. Holly Quadrangle

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: A03 **NAME OF SITE:** Richard Rankin Complex

Size: A=28, B=11, C=11, Wetland = 18 **Quadrangle:** Mt. Holly
Province: PIEDMONT **Watershed:** Dutchmans Creek

Site Significance:
STATE (Areas A, B and C contain Magnolia macrophylla. Area A is the richest with hundreds (100's) of the Magnolias, some with DBH's of 10.5" & 8.2". Present also is Panax quinquefolium and Cypripedium calceolus!)

Special Status Species (attach EORs): Panax quinquefolium, Magnolia macrophylla

Potential for other Special Status Species:

Other noteworthy species or features present: Cypripedium calceolus

PHYSICAL DESCRIPTION

A: Steep sided cove draining to NW. B: NW facing slope. C: NW facing slope.

Locations and Directions:

Mt. Holly North on Woodlawn Ave, Old NC 27, SR 1923, to Lowland Dairy Road, SR 1935. Continue on SR 1923, (ca. 0.7mile). Turn Right onto Old Gravel Rd. Continue (ca. 0.15 mile) to old house. Site "A" is West of house (ca.1000ft). "B" is NW (ca.1000ft). "C" is (ca.1400ft) N-NE.

Landscape Description:

Aspect: All, NW **Slope:** 0-5-10-35 **Elevation (ft above MSL):** 640-710

Topographic Position: Upper/Mid/Lower Slopes

Hydrology: Terrestrial **Moisture:** Mesic

Geology: Mqd - Metamorphosed quartz diorite and tonalite

Soils: PaE-Pacolet sandy loam, 15-25% slopes

Comments on Physical Description:

Rock outcroppings

BIOLOGICAL DESCRIPTION

A. Sites A, B and C are a Dry-Mesic Oak-Hickory Forest, tending more toward Mesic. The Wetland (C Wetland) is a Piedmont/Low Mountain Alluvial Forest.
B. The canopy, subcanopy, shrub and herb layers are well developed, due to ravines with increased moisture levels. Area B has a large number of Magnolia macrophylla.
C. See the individual write-ups for species composition.
D. Each site is only part of a complex, which makes for a botanically diverse and rich forest.
E. The slopes and ravines are relatively undisturbed. The uplands have had disturbance in the past. There is indication of recent property line surveying and whether this indicates future logging is uncertain.
F. A=28 acres, B=11 acres, C=11 acres and Wetland=18 acres.

Site Integrity: Fair to Good **Fire regime:** None.

Maximum DBH of canopy trees: 38" **Average DBH of canopy trees:** 14"

Logged (y/n): No **Stream channelized (y/n):** No

Even-aged canopy (y/n): No **Dredging/filling (y/n):** No

Non-native / weedy species present (y/n): Yes **Understory cleared (y/n):** No

Ditched/drained (y/n): No **Grazing (y/n):** No

Comments on Biological Description:

Non-native species: Lonicera japonica, Elaeagnus umbellata, Albizia julibrissin. Large diversity of herbs. Kalmia in large diameters. Good integrity "cove" type forest.

ADJACENT LAND USE:

PROTECTION / MANAGEMENT NEEDS:

Survey lines, flagged property corners and paint marked trees are present. This may suggest future logging.

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: A03 **NAME OF SITE:** Richard Rankin Complex

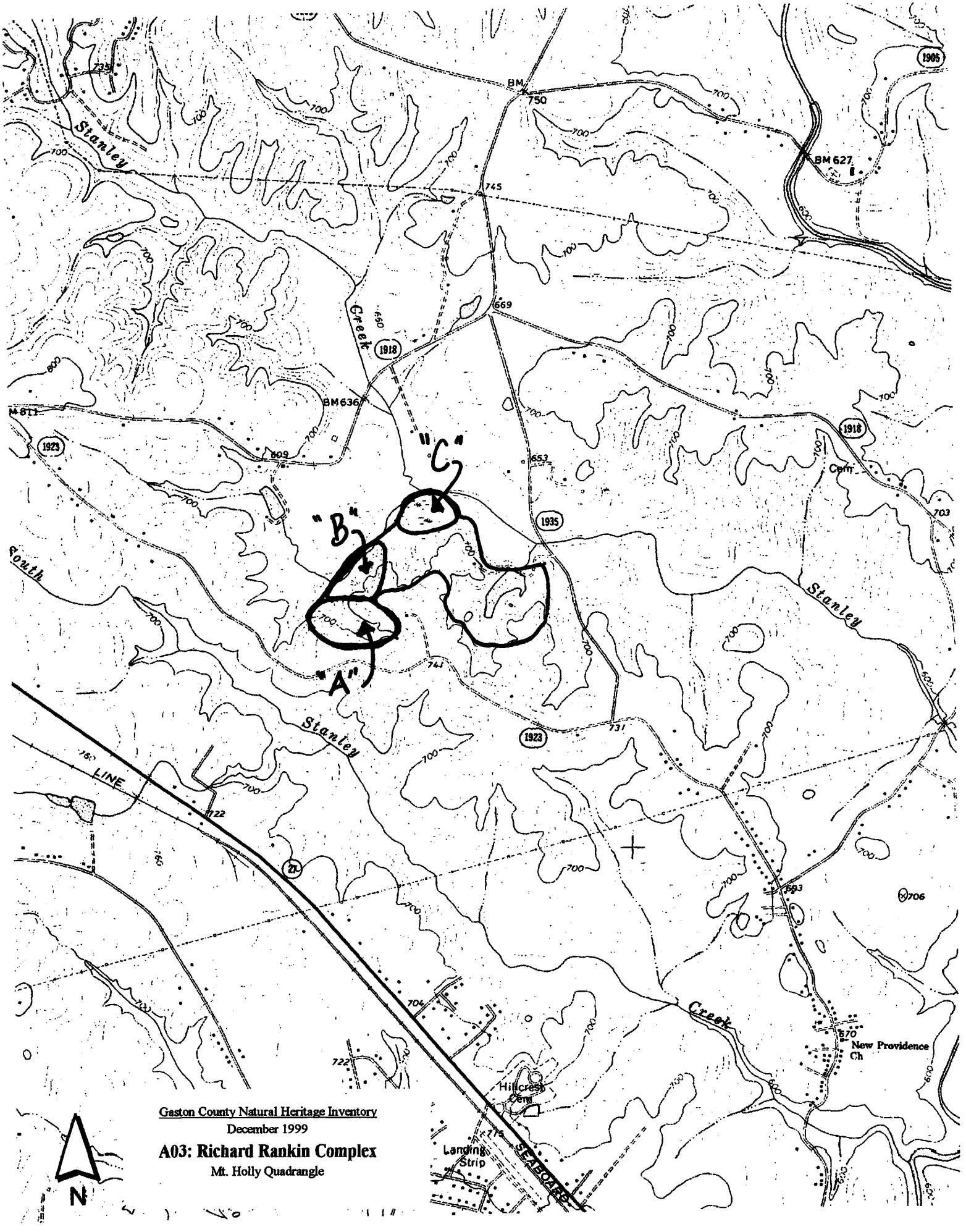
DOCUMENTATION:
UNCC

PLANT SPECIES LIST:
SITE A - Steep sided cove draining to the northwest. Very rich botanically.
CANOPY: Quercus alba, Fagus grandifolia, Liriodendron tulipifera, Carya tomentosa, Platanus occidentalis.
SUBCANOPY: Magnolia macrophylla, Fagus grandifolia, Acer rubrum, Ulmus rubra, Pinus virginiana, Tilia heterophylla, Cornus florida, Juniperus virginiana, Albizia julibrissin, Carpinus caroliniana, Asimina triloba.
SHRUBS: Euonymus americanus, Chionanthus virginicus, Hamamelis virginiana, Asimina triloba, Calycanthus floridus, Sambucus canadensis, Tilia heterophylla.
VINES: Vitis rotundifolia, Lonicera japonica, Parthenocissus quinquefolia, Dioscorea villosa, Campsis radicans, Toxicodendron radicans.
HERBS: Cypripedium calceolus, Panax quinquefolium, Amianthium muscaetoxicum, Collinsonia canadensis, Geranium maculatum, Iris cristata, Sanguinaria canadensis, Aristolochia serpentaria, Tiarella cordifolia, Cimicifuga racemosa, Desmodium nudiflorum, Medeola virginiana, Smilacina racemosa, Prenanthes spp., Polygonatum biflorum, Obolaria virginica, Salvia urticifolia, Trillium cernuum, T. catesbaei, Hepatica americana, Podophyllum peltatum, Viola tripartita, Monotropa uniflora, Phryma leptostachya, Smilax herbacea.
FERNS: Adiantum pedatum, Asplenium platyneuron, Polystichum acrostichoides, Botrychium virginianum, Thelypteris hexagonoptera, Lycopodium flabelliforme, L. lucidulum.

SITE B - Northwest facing slope.
CANOPY: Quercus alba, Q. rubra, Q. velutina, Fagus grandifolia, Betula nigra, Nyssa sylvatica, Carya tomentosa, Platanus occidentalis, Populus deltoides, Fraxinus pennsylvanica.
SUBCANOPY: Magnolia macrophylla, Cornus florida, Juniperus virginiana, Quercus rubra, Cercis canadensis, Carya cordiformis, Tilia heterophylla.
SHRUBS: Styrax grandifolia, Tilia heterophylla, Staphylea trifolia, Rhododendron nudiflorum, Amelanchier arborea, Euonymus americanus, Chionanthus virginicus, Hamamelis virginiana, Acer negundo, Arundinaria gigantea.
VINES: Vitis rotundifolia, Lonicera japonica, Smilax spp., Parthenocissus quinquefolia, Dioscorea villosa.
HERBS: Amianthium muscaetoxicum, Collinsonia canadensis, Geranium maculatum, Iris cristata, Sanguinaria canadensis, Arisaema triphyllum, Aristolochia serpentaria, Tiarella cordifolia, Cimicifuga racemosa, Desmodium nudiflorum, Medeola virginiana, Smilacina racemosa, Prenanthes spp., Polygonatum biflorum, Hepatica americana, Trillium catesbaei, Chamaelirium luteum, Heuchera americana, Ligusticum canadense, Uvularia perfoliata, Thalictrum thalictroides, Chimaphila maculata, Tipularia discolor.
FERNS: Adiantum pedatum, Woodwardia areolata, Polystichum acrostichoides, Botrychium virginianum.

SITE C - Northwest facing slope with a wetland at the base.
CANOPY: Liriodendron tulipifera, Quercus alba, Q. velutina, Fagus grandifolia, Acer rubrum, Nyssa sylvatica, Populus deltoides.
SUBCANOPY: Oxydendrum arboreum, Nyssa sylvatica, Morus rubra, Tilia heterophylla, Quercus michauxii, Acer negundo, Betula nigra, Platanus occidentalis, Liquidambar styraciflua.
SHRUBS: Staphylea trifolia, Euonymus americanus, Chionanthus virginicus, Hamamelis virginiana, Asimina triloba, Castanea pumila, Ilex opaca, Kalmia latifolia, Corylus americana, Carya cordiformis.
VINES: Vitis rotundifolia, Lonicera japonica, Smilax spp.
HERBS: Geranium maculatum, Sanguinaria canadensis, Arisaema triphyllum, Aristolochia serpentaria, Tiarella cordifolia, Cimicifuga racemosa, Desmodium nudiflorum, Medeola virginiana, Smilacina racemosa, Polygonatum biflorum, Trillium catesbaei, Chamaelirium luteum, Thalictrum thalictroides, Passiflora lutea, Cynoglossum virginianum, Scutellaria spp., Mitchella repens.
FERNS: Polystichum acrostichoides, Botrychium virginianum, Adiantum pedatum, Asplenium platyneuron.

SITE C WETLAND - Holds water much of the year.
CANOPY: Fraxinus pennsylvanica, Betula nigra, Acer rubrum, Platanus occidentalis, Liquidambar styraciflua, Liriodendron tulipifera, Juglans nigra, Quercus phellos.
SUBCANOPY: Liquidambar styraciflua, Fraxinus pennsylvanica, Acer negundo, Oxydendrum arboreum, Liriodendron tulipifera.



Gaston County Natural Heritage Inventory

December 1999

A03: Richard Rankin Complex

Mt. Holly Quadrangle

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: A04 **NAME OF SITE:** Stagecoach Road Granitic Outcrop and Wetland

Size: 30+ acres **Quadrangle:** Gastonia South
Province: PIEDMONT **Watershed:** Crowders Creek

Site Significance:
REGIONAL (Largest and best preserved granitic outcrop in county.)

Special Status Species (attach EORs):

Potential for other Special Status Species:

Other noteworthy species or features present: Sedum smallii, Hypericum gentianoides, Talinum teretifolium, Asimina parviflora

PHYSICAL DESCRIPTION

Adjacent to slope is an outcrop (ca. 2 acres). Vegetation islands separate the exposures. Many of the terraces have shallow pools with thin soil.

Locations and Directions:

From 321 South, the outcrop is west of Stagecoach Rd at Blackwood Creek. Approach from Stagecoach Rd at the entrance to a new sewer line along Blackwood Creek. Walk West along the construction r/w and creek, cross the flood plain. Proceed up the slope moving WSW. Outcrop is several hundred yards to the West.

Landscape Description:

Aspect: N, E, S, W **Slope:** Flat - 25' **Elevation (ft above MSL):** 610

Topographic Position: Upper/Mid/Lower Slopes, Alluvial Flat

Hydrology: Terrestrial, Palustrine **Moisture:** Mesic/Dry Mesic/Xeric (Dry), Seasonally Flooded

Geology: Massive granite rock outcrop from the Pennsylvanian to Permian (270-230my). Particularly meya crystic to equigranular High Shoals Granite

Soils: PaE-Pacolet sandy loam, 15-25% slopes; Ro-rock outcrop

Comments on Physical Description:

Remaining "Hugo" damage in some areas of the slope. Rich slope leading to outcrop area.

BIOLOGICAL DESCRIPTION

A. Sloping Granitic Flat Rock and Bottomland Forest.
B. Open rock areas: Vegetation dominated by distinct species that tend to thrive in thin soils and form small islands. The dominant species in these communities is Sedum smallii. Talinum teretifolium, Hypericum gentianoides, Sphagnum spp. and other mosses. Surrounding the outcrop is a rich woods slope dominated by Carya glabra and C. tomentosa in the canopy and subcanopy. Other understory species include Chionanthus virginicus, Calycanthus floridus, Viburnum nudum, Rhamnus caroliniana, Cornus alternifolia, Asimina parviflora, Castanea pumila and Sassafras albidum. Dominant vines include Matalea carolinensis, Campsis radicans and Vitis rotundifolia. The herbaceous layer becomes more diverse on the slopes, as is expected. Species include Aristolochia serpentaria, Cynoglossum virginianum, Commelina spp., Impatiens capensis, Ligusticum canadensis, Monotropa uniflora, Trillium catesbaei, Sanguinaria canadensis, Uvularia perfoliata, Polystichum acrostichoides and Woodwardia areolata. Along the edge of the granitic outcrop area there are lots of Agave virginica.
C. This site is unique due to the overwhelming dominance of Carya glabra and C. tomentosa.
D. The rock outcrop grades into a mesic Hickory dominated forest with rich slopes.
E. The quality of this site is good. There are some areas with remaining "HUGO" damage.
F. ca. 3000 x 1250 map feet, approx. 30+ acres.

Site Integrity: Good **Fire regime:**

Maximum DBH of canopy trees: 26" **Average DBH of canopy trees:** 13"

Logged (y/n): Yes **Stream channelized (y/n):** No

Even-aged canopy (y/n): Yes **Dredging/filling (y/n):** No

Non-native / weedy species present (y/n): No **Understory cleared (y/n):** No

Ditched/drained (y/n): No **Grazing (y/n):** No

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: A04 **NAME OF SITE:** Stagecoach Road Granitic Outcrop and Wetland

Comments on Biological Description:

Dominants are Carya spp. in canopy. Rich woods slope dominated by Carya glabra. Adjacent is an outcrop (ca. 2 acres) with vegetation islands separating the exposures. Many of the terraces have shallow pools with thin soil dominated by Sedum smallii.

ADJACENT LAND USE: 0

PROTECTION / MANAGEMENT NEEDS:

DOCUMENTATION:

We walked in the site through rich woods slopes which led to the (ca. 2 ac.) outcrop site. The rich slopes are a good buffer zone for the outcrop itself. Since the survey, this site has been timbered, except for a 50' buffer around the outcrop. Specimens collected for UNCC herbarium.

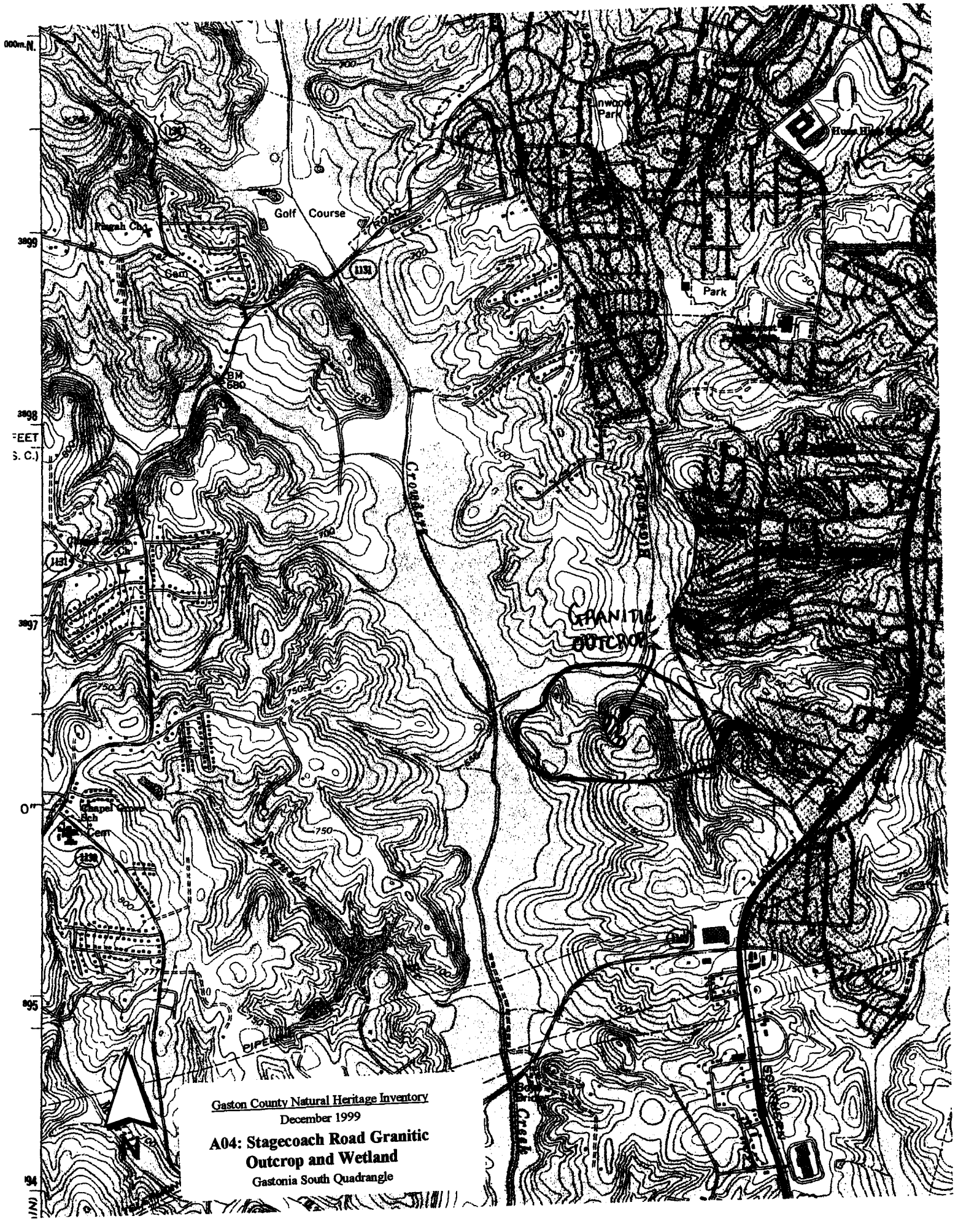
PLANT SPECIES LIST:

CANOPY: Carya tomentosa, C. glabra, Quercus alba, Juglans nigra.
SUBCANOPY: Carpinus caroliniana, Quercus velutina.
SHRUBS: Viburnum nudum, Rhamnus caroliniana, Cornus alternifolia, Asimina parviflora, Ilex decidua, Castanea pumila, Sassafras albidum, Corylus cornuta, Asimina triloba.
VINES: Matalea carolinensis, Campsis radicans, Vitis rotundifolia.
HERBS: Aristolochia serpentaria, Agave virginica, Aureolaria virginica, Cimicifuga racemosa, Collinsonia canadensis, Cynoglossum virginianum, Commelina spp., Epilobium coloratum, Hypericum gentianoides, Impatiens capensis, Ligusticum canadense, Medeola virginica, Monotropa uniflora, Polygonatum biflorum, Trillium catesbaei, Sanguinaria canadensis, Talinum teretifolium, Sedum smallii, Uvularia perfoliata.
FERNS: Polystichum acrostichoides, Woodwardia areolata, Asplenium platyneuron.

ANIMAL SPECIES LIST:

DATE: 18-Oct-96 **UPDATES:** 06-June-97

OWNER NAME: Private



Gaston County Natural Heritage Inventory

December 1999

A04: Stagecoach Road Granitic Outcrop and Wetland

Gastonia South Quadrangle

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: A05 **NAME OF SITE:** Armstrong Ford

Size: 45 acres **Quadrangle:** Belmont
Province: PIEDMONT **Watershed:** South Fork Catawba

Site Significance:
STATE (Species diversity.)

Special Status Species (attach EORs): Schizandra glabra, Magnolia macrophylla and Cornus alternifolia
Potential for other Special Status Species:
Other noteworthy species or features present: Magnolia macrophylla, Cornus alternifolia.

PHYSICAL DESCRIPTION

West to North facing hardwood slope above a tributary to South Fork Catawba River.

Locations and Directions:

From Belmont, South on Armstrong Rd, SR 2519, to upper Armstrong Bridge. Site is NE of South Fork Catawba River & SE of Armstrong Rd.

Landscape Description:

Aspect: All **Slope:** 5-10-35 **Elevation (ft above MSL):** 570-610

Topographic Position: Upper/Mid/Lower Slopes

Hydrology: Terrestrial **Moisture:** Mesic, Dry Mesic

Geology: Mod: Metamorphosed quartz diorite and tonalite within Charlotte Belt

Soils: GaE-Gaston loam, 15-25% slopes; GaD2-Gaston sandy clay loam, 8-15% slopes, eroded; CH-Chewacla loa frequently flooded; WKF-Wilkes loam, 15-30% slopes

Comments on Physical Description:

BIOLOGICAL DESCRIPTION

A. Mesic Mixed Hardwood Forest, Piedmont subtype that grades into a Piedmont Alluvial Forest.
B. The canopy, subcanopy, shrub and herb layers are well developed, with the N facing slope, the increased soil moisture supports a greater diversity of species.
C. The canopy is dominated by Fagus grandifolia, Liriodendron tulipifera, Quercus rubra and Carya tomentosa. The subcanopy includes Magnolia macrophylla, Nyssa sylvatica, Acer leucoderme and Oxydendrum arboreum. Shrubs include Elaeagnus umbellata, Euonymus americanus, Hamamelis virginiana, Ceanothus americanus, Cornus alternifolia and Corylus cornuta. Herbs include Tiarella cordiformis, Cimicifuga racemosa, Ligusticum canadense, Hexastylis minor, Botrychium virginianum, Hepatica americana and Hieracium venosum. The principal vine is Schizandra glabra.
D. The N facing slope community is the most important one. Another adjacent slope also was examined. This second site lies just South and has a NW exposure. It has been disturbed more and is less rich in species.
E. The primary site has high species diversity and includes a large population of Schizandra glabra. Magnolia macrophylla occurs on the lower parts of the slopes and ravines along the Western exposure.

Site Integrity: Good **Fire regime:**

Maximum DBH of canopy trees: 28" **Average DBH of canopy trees:** 10"

Logged (y/n): No **Stream channelized (y/n):** No

Even-aged canopy (y/n): No **Dredging/filling (y/n):** No

Non-native / weedy species present (y/n): No **Understory cleared (y/n):** No

Ditched/drained (y/n): No **Grazing (y/n):** No

Comments on Biological Description:

This large area has many different microhabitats.

ADJACENT LAND USE:

PROTECTION / MANAGEMENT NEEDS:

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: A05 **NAME OF SITE:** Armstrong Ford

DOCUMENTATION:
UNCC Herbarium

PLANT SPECIES LIST:
The list varies somewhat depending on exposure, however all the species noted are reported.
CANOPY: Quercus alba, Q. rubra, Q. phellos, Fagus grandifolia, Liriodendron tulipifera, Liquidambar styraciflua, Pinus echinata, Tilia americana, Platanus occidentalis, Carya glabra, C. tomentosa, Nyssa sylvatica.
SUBCANOPY: Magnolia macrophylla, Acer rubrum, Oxydendrum arboreum, Fraxinus pennsylvanica, Carpinus caroliniana, Juniperus virginiana, Cornus florida, Magnolia tripetela, Morus rubra, Rhamnus caroliniana, Betula nigra, Acer saccharum spp. leucoderme, Paulownia tomentosa, Asimina triloba, Ulmus rubra, Salix nigra, Celtis laevigata.
SHRUBS: Cercis canadensis, Corylus americana, C. cornuta, Castanea dentata, C. pumila, Ilex opaca, I. verticillata, Styrax grandifolia, Cornus amomum, C. alternifolia, Carpinus caroliniana, Viburnum dentatum, Symplocos tinctoria, Euonymus americanus, Hamamelis virginiana.
VINES: Schizandra glabra, Toxicodendron radicans, Parthenocissus quinquefolia, Smilax spp., Dioscorea villosa, Lonicera japonica, Vitis rotundifolia, Campsis radicans, Anisostichus capreolata.
HERBS: Tragia urticifolia, Liatris squarrosa, Prenanthes spp., Apocynum cannabinum, Epifagus virginiana, Conopholis americana, Hexastylis arifolia, H. minor, Chimaphila maculata, Goodyera pubescens, Uvularia perfoliata, Iris cristata, Mitchella repens, Aristolochia serpentaria, Amianthium muscaetoxicum, Polygonatum biflorum, Phryma leptostachya, Sanguinaria canadensis, Cimicifuga racemosa, Microstegium vimineum, Polymnia uvedalia, Tiarella cordifolia var. collina, Hepatica americana, Fragaria virginiana, Commelina communis, Scutellaria elliptica, Medeola virginiana, Trillium catesbaei, Lilum michauxii, Helianthus divaricatus, Geranium maculatum, Heuchera americana, Smilax ecirrhata, Cynoglossum virginianum, Podophyllum peltatum, Smilacina racemosa, Tipularia discolor, Hypoxis hirsuta, Thalictrum thalictroides, Houstonia purpurea, Ligusticum canadense, Arisaema triphyllum, Hieracium venosum, Asclepias tuberosa, Amsonia tabernaemontana var. tabernaemontana, Acorus calamus, Peltandra virginica, Sagittaria spp., Impatiens capensis, Typha latifolia.
FERNS: Onoclea sensibilis, Polystichum acrostichoides, Botrychium virginianum, Asplenium platyneuron, Dennstaedtia punctuloba, Adiantum pedatum, Thelypteris hexagonoptera.

ANIMAL SPECIES LIST:

DATE: 12-May-97 **UPDATES:** 5-Aug-1997, 15-Sep-1997, 18-Sep-1997

OWNER NAME: Private

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT, HEALTH AND NATURAL RESOURCES
RALEIGH, NORTH CAROLINA

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: A06 **NAME OF SITE:** Jean Rankin Forest

Size:
Quadrangle: Mt. Holly
Province: PIEDMONT
Watershed: South Fork Catawba

Site Significance:
REGIONAL (Site has good species diversity and has an archeological location on the floodplain. Also Magnolia macrophylla.)

Special Status Species (attach EORs): Magnolia macrophylla

Potential for other Special Status Species:

Other noteworthy species or features present: Magnolia macrophylla, Dennstaedtia punctilobula, Galax aphylla, Pyrularia pubera

PHYSICAL DESCRIPTION

N, NW facing slopes and rich areas at toe of slope along Catawba/S. Fork River. Area surveyed was from the treeline to the Catawba River.

Locations and Directions:

From Gastonia, take 279 N to Hwy 275 E (Dallas-Stanley Hwy). Continue towards Stanley, turning Right onto Hickory Grove Church Rd. Continue until you reach Rankin Rd (Right). This leads into the site.

Landscape Description:

Aspect: N, NW **Slope:** Flat, 0-5-10-35, 35+ **Elevation (ft above MSL):** 640-700

Topographic Position: Upper/Mid/Lower Slopes

Hydrology: Terrestrial **Moisture:** Seasonally Wet, Mesic

Geology: (Czfv) - Felsic metavolcanic dacitic to rhyolitic flows and tuffs. Light gray to greenish gray in color, minor mafic and intermediate form at metavolcanic rock

Soils: Co-Congaree loam, occasionally flooded; PaF-Pacolet sandy loam, 25-45% slopes; PaE-Pacolet sandy loam 25% slopes; CeBz-Cecil sandy clay loam, 2-8% slopes, eroded; PaDz-8-15% slopes

Comments on Physical Description:

Along the slope adjacent to the river, area full of Magnolia macrophylla, Galax aphylla and Pyrularia pubera.

BIOLOGICAL DESCRIPTION

A. Mesic Mixed Hardwood Forest (Piedmont subtype), Piedmont/Low Mt. Alluvial Forest.
B. The canopy is dominated by Quercus alba, Q. rubra and Fagus grandifolia. Other Quercus spp. and some Pinus spp. also are present. The subcanopy is dominated, in areas, by Magnolia macrophylla. Also in abundance are Oxydendrum arboreum, Cornus florida, Acer rubrum and Nyssa sylvatica. Shrubs include Carya spp., Viburnum dentatum, Corylus cornuta, Castanea dentata, Ilex opaca, Hamamelis virginiana, Kalmia latifolia, Rhododendron nudiflorum and Viburnum acerifolium. Vitis spp., Toxicodendron radicans, Parthenocissus quinquefolia and Smilax spp. are predominant vines. The herb layer is diverse, including Lilium michauxii, Hexastylis minor, Hydrangea arborescens, Arisaema triphyllum, Trillium catesbaei, Coreopsis major, Uvularia sessilifolia, Eupatorium spp., Salvia spp., Aureolaria spp., Tradescantia ohiensis, Pyrularia pubera, Galax aphylla, Gillenia trifoliata and Xanthorhiza simplicissima. Ferns include Adiantum pedatum, Polystichum acrostichoides, Pteridium aquilinum, Athyrium asplenioides, Thelypteris noveboracensis, Woodwardia areolata and Dennstaedtia punctilobula.
C. The presence of Magnolia macrophylla, in abundance, is a positive aspect of the site integrity. Other less common spp. occur as well: Dennstaedtia, Galax and Pyrularia.
D. This site is positioned with one long stretch between the Catawba River and access road (Rankin Rd). The remainder of the site follows the contours of the land, concentrating on the steeper slopes. Elevation ranges from 640-700 feet. At the toe of the slope, the site grades into Piedmont/Low Mtn. Alluvial Forest.
E. Disturbance (ie. timbering) is confined to a very small portion of the site which was probably damaged already due to natural occurrences. There are a few horse trails through the property allowing easy access to the M. macrophylla area.
F. ca. 2 miles in length.

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: A06 **NAME OF SITE:** Jean Rankin Forest

Site Integrity: Good **Fire regime:**

Maximum DBH of canopy trees: 30" **Average DBH of canopy trees:** 16"

Logged (y/n): Yes **Stream channelized (y/n):** No

Even-aged canopy (y/n): No **Dredging/filling (y/n):** No

Non-native / weedy species present (y/n): Yes **Understory cleared (y/n):** No

Ditched/drained (y/n): No **Grazing (y/n):** Yes

Comments on Biological Description:

In a confined area, probably damaged already by Hugo, tornadoes, etc. Non-native: Elaeagnus. Grazing: horses. Other: Several horse trails through property.

ADJACENT LAND USE: Agricultural Uses, Residential

PROTECTION / MANAGEMENT NEEDS:

DOCUMENTATION:
UNCC Herbarium. Topo map attached.

PLANT SPECIES LIST:
CANOPY: Quercus coccinea, Q. alba, Q. falcata, Q. prinus, Q. rubra, Pinus echinata, Pinus virginiana, Liriodendron tulipifera, Liquidambar styraciflua, Fagus grandifolia, Q. velutina.
SUBCANOPY: Cornus florida, Carpinus caroliniana, Acer rubrum, Oxydendrum arboreum, Magnolia macrophylla (DBH 4.7", 5.2", 5.8",7.0",7.9",9.8",10.2"), Nyssa sylvatica, Q. phellos, Halesia carolina, Fraxinus pennsylvanica, Tilia americana, Calycanthus floridus.
SHRUBS: Carya tomentosa, Calycanthus floridus, Viburnum dentatum, Diospyros virginiana, Corylus cornuta, Chionanthus virginicus, Castanea dentata, Elaeagnus umbellata, Ilex opaca, Hamamelis virginiana, Kalmia latifolia, Symplocos tinctoria, Leucothoe axillaris var. editorum, Viburnum acerifolium, Rhododendron nudiflorum, Hydrangea arborescens, Euonymus americana, Amelanchier spp., Xanthorhiza simplicissima, Rhus glabra, Arundinaria gigantea, Vaccinium spp.
VINES: Vitis rotundifolia, Parthenocissus quinquefolia, Toxicodendron radicans, Dioscorea villosa, Smilax spp.
HERBS: Lilium michauxii, Heuchera americana, Hexastylis minor, Thalictrum thalictroides, Iris cristata, Aruncus dioicus, Chimaphila maculata, Arisaema triphyllum, Medeola virginiana, Chamaelirium luteum, Tiarella cordifolia, Trillium catesbaei, Smilax ecirrhata, Smilacina racemosa, Polygonatum biflorum, Collinsonia canadensis, Hepatica americana, Sanicula canadensis, Mitchella repens, Aristolochia serpentaria, Epifagus virginiana, Tipularia cordifolia, Coreopsis major, Ligusticum canadense, Uvularia sessilifolia, Salvia spp., Eupatorium spp., Uvularia perfoliata, Aureolaria spp., Tradescantia ohiensis, Desmodium spp., Podophyllum peltatum, Amianthium muscaetoxicum, Cimicifuga racemosa, Geranium maculatum, Pyrularia pubera, Sanguinaria canadensis, Galax aphylla, Gillenia trifoliata.
FERNS: Adiantum pedatum, Polystichum acrostichoides, Pteridium aquilinum, Athyrium asplenioides, Thelypteris noveborecensis, Woodwardia areolata, Dennstaedtia punctilobula

ANIMAL SPECIES LIST:

DATE: 21-May-97 **UPDATES:**

OWNER NAME: Private

Gaston County Natural Heritage Inventory
December 1999

A06: Jean Rankin Forest
Mt. Holly Quadrangle

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: A07 **NAME OF SITE:** Kenneth Oates Farm Forest (Area B)

Size: 55 acres **Quadrangle:** Kings Mtn.
Province: PIEDMONT **Watershed:** Crowders Creek

Site Significance:
REGIONAL (Combines with other two for diversity.)

Special Status Species (attach EORs):

Potential for other Special Status Species:

Other noteworthy species or features present: Cypripedium calceolus var. pubescens (Yellow Lady's Slipper), Trillium cernuum

PHYSICAL DESCRIPTION

For South facing slope, S, SE, SW facing slopes.

Locations and Directions:

From Gastonia, take 321 S to SR 1103 (Crowders Creek Rd). Turn Right and continue to SR 1112 (Lewis Rd). Continue to Sparrow Springs Rd (still SR 1112) and turn Left. Cross the creek. Mr. Oates' property is on the Right.

Landscape Description:

Aspect: S **Slope:** 0-5-10-35 **Elevation (ft above MSL):** 700-800'

Topographic Position: Upper/Mid/Lower Slopes

Hydrology: Terrestrial, Palustrine **Moisture:** Seasonally Wet, Mesic

Geology: (Zbt) Battleground Formation. Quartz-sericite schist with metavolcanic rock, quartz-pebble metaconglomerate, kyanite-sillimanite quarzite and garnet-quartz rock

Soils: TaE-Tatum gravelly loam 15-25% slopes; TaD-Tatum gravelly loam, 8-15% slopes; TaB-Tatum gravelly lo 8% slopes

Comments on Physical Description:

Very rich slopes with rich drainage areas.

BIOLOGICAL DESCRIPTION

A. Mesic Mixed Hardwood Forest.
B. The canopy is dominated by mesophytic trees such as Fagus grandifolia, Liriodendron tulipifera, Quercus rubra, Acer rubrum and Quercus alba.
The understory trees include Asimina triloba, Cornus florida, Alnus serrulata and Oxydendrum arboreum.
Shrub species include Euonymus americana, Carya cordiformis, Magnolia tripetela, Lindera benzoin, Styrax spp., Rhododendron nudiflorum, Kalmia latifolia, Corylus americana, Salix sericea and Cornus amomum.
The herb layer is fairly dense including Arisaema triphyllum, Uvularia perfoliata, Viburnum prunifolium, Ligusticum canadense, Xanthorhiza simplicissima, Desmodium nudiflorum, Trillium cernuum and Cypripedium calceolus var. pubescens.
A variety of ferns were present, including Polystichum acrostichoides, Botrychium virginianum, Asplenium platyneuron, Woodwardia areolata, Onoclea sensibilis, Osmunda cinnamomea, Thelypteris noveboracensis, T. hexagonoptera, Athyrium asplenioides and Adiantum pedatum.
D. Grades down into a Piedmont/Low Mt. Alluvial Forest. Upland, the site grades into a drier Oak-Hickory Forest.
E. The quality of this site is good. It seems to be the least disturbed of all three areas we surveyed on this farm.
F. 55 acres.

Site Integrity: Good **Fire regime:**

Maximum DBH of canopy trees: 32" **Average DBH of canopy trees:** 18"

Logged (y/n): No **Stream channelized (y/n):** No

Even-aged canopy (y/n): No **Dredging/filling (y/n):** No

Non-native / weedy species present (y/n): No **Understory cleared (y/n):** No

Ditched/drained (y/n): No **Grazing (y/n):** No

Comments on Biological Description:

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: A07 **NAME OF SITE:** Kenneth Oates Farm Forest (Area B)

ADJACENT LAND USE: Dairy Farm

PROTECTION / MANAGEMENT NEEDS:

DOCUMENTATION:
UNCC

PLANT SPECIES LIST:
CANOPY: Quercus rubra, Q. falcata, Liriodendron tulipifera, Acer rubrum, Q. alba, Fagus grandifolia (32" DBH), Pinus echinata (18" DBH avg.).
SUBCANOPY: Asimina triloba, Cornus florida, Oxydendrum arboreum, Carpinus caroliniana, Morus rubra, Juniperus virginiana, Fraxinus pennsylvanica, Cornus alternifolia, Alnus serrulata SHRUBS: Carya spp., Cercis canadensis, Fraxinus spp., Euonymus americanus, Carya cordiformis, Magnolia tripetela, Sassafras albidum, Lindera benzoin, Corylus americana, Styrax grandifolia, Chionanthus virginicus, Rhododendron nudiflorum, Salix sericea, Cornus amomum, Sambucus canadensis, Ilex opaca, Kalmia latifolia, Xanthorhiza simplicissima.
VINES: Vitis rotundifolia, Smilax spp., Parthenocissus quinquefolia, Toxicodendron radicans, Campsis radicans, Dioscorea villosa.
HERBS: Cypripedium calceolus var. pubescens, Epifagus virginiana, Arisaema triphyllum, Collinsonia canadensis, Cimicifuga racemosa, Smilacina racemosa, Polygonatum biflorum, Podophyllum pedatum, Uvularia perfoliata, Mitchella repens, Goodyera pubescens, Geranium maculatum, Ligusticum canadense, Sanguinaria canadense, Arundinaria gigantea, Chimaphila maculata, Desmodium nudiflorum, Trillium cernuum, Impatiens capensis, Eupatorium spp., Microstegium vimineum, Medeola virginiana, Amianthium muscaetoxicum, Vaccinium spp.
FERNS: Polystichum acrostichoides, Botrychium virginianum, Asplenium platyneuron, Thelypteris noveboracensis, Adiantum pedatum, Thelypteris hexagonoptera, Athyrium asplenioides, Onoclea sensibilis.

ANIMAL SPECIES LIST:

DATE: 04-Jun-97 **UPDATES:**

OWNER NAME: Private

Gaston County Natural Heritage Inventory
December 1999

A07: Kenneth Oates Farm Forest
(Area B)
Kings Mtn. Quadrangle

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: A08 **NAME OF SITE:** Laurel Hill Nursery Forest

Size: ca. 215+ acres (under negotiation) **Quadrangle:** Mt. Holly,Gastonia N
Province: PIEDMONT **Watershed:** Long Creek

Site Significance:
REGIONAL (High species diversity. Many Magnolia macrophylla, some large. The presence of Panax quinquifolium.)

Special Status Species (attach EORs): Panax quinquefolium, 21 plants

Potential for other Special Status Species:

Other noteworthy species or features present: Species of algae - Chara

PHYSICAL DESCRIPTION

There is a nice wet area below the dam.

Locations and Directions:

Northeast of Ranlo, West of Spencer Mtn. Rd and South of Long Creek.

Landscape Description: A small drainage basin which flows North to Long Creek.

Aspect: N, E, W **Slope:** 0 to 35% **Elevation (ft above MSL):** 660-840

Topographic Position: Mid and Lower Slopes

Hydrology: Terrestrial, Palustrine **Moisture:** Xeric, Dry Mesic, Mesic

Geology: Zbs - Quartz-sericite schist, Ph-High Shoals Granite, Zbvf-Felsic metavolcanic rocks.

Soils: TaB, TaE, TaD, CeB2, CeD2, GaD2, PaE, UwF, CH

Comments on Physical Description:

This site has an interesting combination of moisture, hydrology and soils throughout.

BIOLOGICAL DESCRIPTION

A. Mesic Mixed Hardwood Forest, Dry-Mesic Oak-Hickory Forest, Piedmont Bottomland Forest.
B. Canopy, subcanopy, shrub and herb layers are well developed with excellent diversity of species at all levels.
C. The canopy is dominated by large Magnolia macrophylla, Fagus grandifolia and Liriodendron tulipifera. Twenty one Panax quinquefolium were counted, and some interesting submerged aquatics were found at the nearby lake.
D. This area is below a Dry-Mesic Oak-Hickory Forest and grades into a small Piedmont Bottomland Forest.
E. The site has fair to good integrity and good species diversity.
F. ca. 215+ acres.

Site Integrity: Good **Fire regime:** None noted.

Maximum DBH of canopy trees: **Average DBH of canopy trees:**

Logged (y/n): No **Stream channelized (y/n):** No

Even-aged canopy (y/n): No **Dredging/filling (y/n):** No

Non-native / weedy species present (y/n): Yes **Understory cleared (y/n):** Yes

Ditched/drained (y/n): No **Grazing (y/n):** No

Comments on Biological Description:

Discussions are underway with the Catawba Lands Conservancy. Due to family illness, the negotiations and the survey were not completed, but should be completed soon and the report will be updated. About 21 Panax quinquefolium plants were found. This area has some large DBH Magnolia macrophylla and Fagus grandifolia.

ADJACENT LAND USE: Nursery, Residential

PROTECTION / MANAGEMENT NEEDS:

DOCUMENTATION:
UNCC

PLANT SPECIES LIST:
CANOPY: Quercus alba, Q. rubra, Fagus grandifolia, Q. coccinea, Q. prinus, Liriodendron tulipifera, Carya spp., Pinus echinata, P. virginiana, Acer rubrum, Oxydendrum arboreum, Q. michauxii.

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: A08 **NAME OF SITE:** Laurel Hill Nursery Forest

SUBCANOPY: Magnolia macrophylla, Nyssa sylvatica, Cornus florida, Carpinus caroliniana, Morus rubra, Ulmus rubra, Juniperus virginiana, Quercus phellos, Fagus grandifolia, Acer rubrum, Halesia carolina, Cercis canadensis, Castanea dentata, Carya spp., Pinus virginiana, Oxydendrum arboreum, Liquidambar styraciflua, Populus deltoides, Prunus serotina, Fraxinus spp.
SHRUBS: Euonymus americanus, Vaccinium spp., Kalmia latifolia, Ilex opaca, Rhododendron nudiflorum, Xanthorhiza simplicissma, Asimina triloba, Corylus americana, Sassafras albidum, Viburnum prunifolium, Ilex decidua, Leucothoe axillaris, Rhus copallina Viburnum acerifolium, V. dentatum, Alnus serrulata, Nyssa sylvatica, Salix nigra, Symplocos tinctoria, Cornus amomum, Corylus cornuta.
VINES: Dioscorea villosa, D. batatas, Parthenocissus quinquefolia, Vitis rotundifolia, Toxicodendron radicans, Smilax herbacea, S. ecirrhata, Campsis radicans, Passiflora lutea, Lonicera japonica.
HERBS: Galax aphylla, Hexastylis minor, Mitchella repens, Polygonatum biflorum, Phytolacca americana, Hepatica americana, Desmodium spp., Cimicifuga racemosa, Elephantopus tomentosus, Goodyera pubescens, Oxalis spp., Arisaema triphyllum, Epifagus virginiana, Aruncus dioicus, Arundinaria gigantea, Collinsonia canadensis, Chimaphila maculata, Impatiens capensis, Chamaelirium luteum, Smilacina racemosa, Boehmeria cylindrica, Scutellaria elliptica, Sanguinaria canadensis, Galium spp., Ligusticum canadense, Panax quinquefolium (21p), Amianthium muscaetoxicum, Phryma leptostachya, Sanicula spp., Medeola virginiana, Aureolaria spp., Amsonia tabernaemontana var. tabernaemontana, Uvularia perfoliata, Tipularia discolor, Salvia lyrata, Trillium catesbaei, Helianthus atrorubens, H. microcephalus, Solidago odora, Silphium compositum, Tripsacum dactyloides, Ambrosia artemisiifolia, Fragaria virginiana, Tiarella cordifolia, Viola spp., Aristolochia serpentaria, Najas spp.(submersed), Eupatorium spp., Ludwigia peploides, Epigea repens, Polymnia uvedalia, Typha latifolia, Polygonum spp., Microstegium vimineum, Iris cristata, Hypericum spp., Monotropa hypopithys.
FERNS: Polystichum acrostichoides, Thelypteris noveboracensis, T. hexagonoptera, Athyrium asplenioides, Botrychium virginianum, Adiantum pedatum, Botrychium spp., Asplenium platyneuron, Osmunda regalis, O. cinnamomea, Woodwardia areolata, Dennstaedtia punctilobula.

ANIMAL SPECIES LIST:

Pond appears to have life, i.e. turtles.

DATE: 25-Aug-97 **UPDATES:** 16-Sep-97

OWNER NAME: Private

Gaston County Natural Heritage Inventory
December 1999

A08: Laurel Hill Nursery Forest
Mt. Holly, Gastonia N Quadrangle

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: A09 **NAME OF SITE:** Pinnacle Road

Size: 42 acres **Quadrangle:** Kings Mtn.
Province: PIEDMONT **Watershed:** Crowders Creek

Site Significance:
STATE (Xeric ridge near Crowders Mtn. State Park.)

Special Status Species (attach EORs): Juniperus communis var. depressa

Potential for other Special Status Species:

Other noteworthy species or features present: Xerophyllum asphodeloides

PHYSICAL DESCRIPTION

Locations and Directions:

Rocky ridge off of Pinnacle Rd, SR 1104, just past Mr. Waterman's House on Left, coming from Crowders Mtn. State Park.

Landscape Description: Monadnock Forest low rocky slope.

Aspect: NW, W, SE **Slope:** 0-35% **Elevation (ft above MSL):** 1300-1800

Topographic Position: Crest, Upper and Mid Slopes

Hydrology: Terrestrial **Moisture:** Xeric

Geology: Zbs - Quartz-sericite schist, Zbc-Quartz-pebble meteconglomerate, ZbKg-Kyanite quartzite

Soils: TaE, UwF, WoA, CH

Comments on Physical Description:

BIOLOGICAL DESCRIPTION

A. Piedmont Monadnock Forest, Low Elevation Rocky Summit.
B. Canopy, subcanopy, shrub and herb layers are well developed but contain a low species diversity.
C. Quercus prinus dominates a canopy which contains Pinus virginiana and Q. marilandica. The subcanopy is dominated by Oxydendrum arboreum and Nyssa sylvatica. The shrub layer contains Kalmia latifolia, Vaccinium spp., Asimina parviflora and Juniperus communis var. depressa. The herb layer is sparse but contains Xerophyllum asphodeloides, Manfreda virginica and Epigea repens.
D. This ridge is part of the Kings Mountain Belt and is located South of Crowders Mountain State Park.
E. A high quality example of a xeric woodland with large rock outcrops and boulders. There appears to be little disturbance to this area except for some Off Road Vehicle traffic.
F. ca. 42 acres.

Site Integrity: Good **Fire regime:**

Maximum DBH of canopy trees: 15" **Average DBH of canopy trees:** 11"

Logged (y/n): No **Stream channelized (y/n):** No

Even-aged canopy (y/n): No **Dredging/filling (y/n):** No

Non-native / weedy species present (y/n): No **Understory cleared (y/n):** No

Ditched/drained (y/n): No **Grazing (y/n):** No

Comments on Biological Description:

Very dry rocky ridge with a lot of interesting species unique to this area.

ADJACENT LAND USE: Hunting, Residential, Boy Scouts

PROTECTION / MANAGEMENT NEEDS:

Control of ORV traffic.

DOCUMENTATION:

PLANT SPECIES LIST:

CANOPY: Quercus prinus, Nyssa sylvatica, Oxydendrum arboreum, Acer rubrum, Quercus marilandica.
SUBCANOPY: Castanea dentata, Quercus rubra, Carya tomentosa, Acer rubrum, Amelanchier spp., Quercus marilandica, Pinus virginiana, Quercus phellos, Diospyros virginiana, Robinia pseudoacacia, Cornus florida.

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

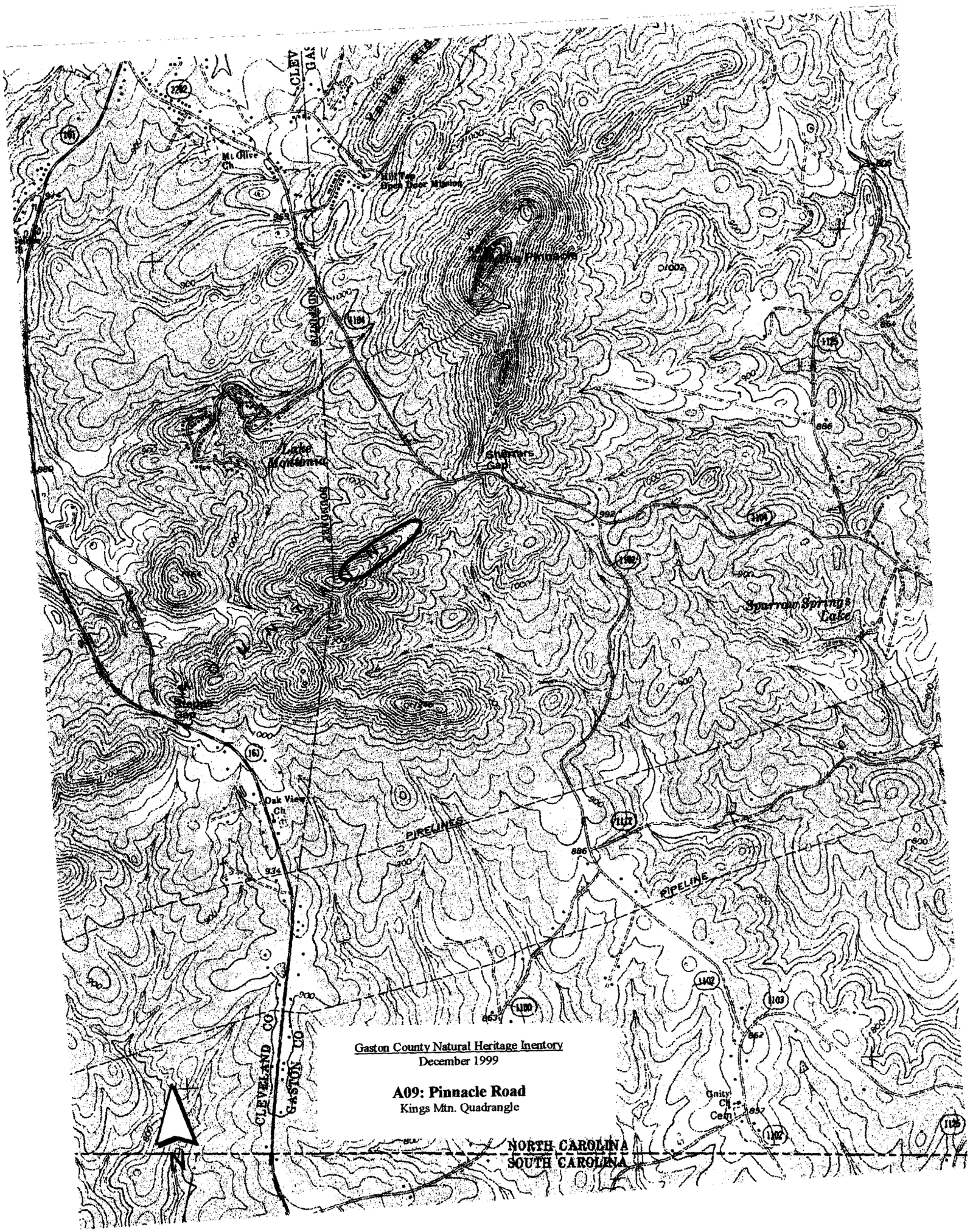
SITE NUMBER: A09 **NAME OF SITE:** Pinnacle Road

SHRUBS: Kalmia latifolia, Juniperus communis, var. depressa, Hamamelis virginica, Asimina parviflora, Sassafras albidum, Ilex opaca, Chionanthus virginicus, Ceanothus americanus, Rhus toxicodendron.
VINES: Toxicodendron radicans, Smilax herbacea, Smilax ecirrhata, Vitis rotundifolia.
HERBS: Xerophyllum asphodeloides, Chimaphila maculata, Coreopsis major, Epigea repens, Agave virginica, Desmodium spp., Galax aphylla, Scleria triglomerata, Phytolacca americana, Euphorbia spp., Solidago odora, Silphium compositum, Hexastylis minor, Euphorbia corollata var. corollata.
FERNS: Polypodium virginianum, Pteridium aquilinum.

ANIMAL SPECIES LIST:

DATE: 28-Aug-97 **UPDATES:** 05-Aug-97

OWNER NAME: Private



Gaston County Natural Heritage Inentory
December 1999

A09: Pinnacle Road
Kings Mtn. Quadrangle

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: A10 **NAME OF SITE:** Friday site, #1-1 & # 1-2 (primary site & annex)

Size: 2.5; 0.5 acres **Quadrangle:** Gastonia North
Province: PIEDMONT **Watershed:** Long Creek

Site Significance:
STATE
(This is the first of two Bog Turtle sites found in Gaston County, NC. Forty-six Bog turtles ages from hatchlings to mature adults of 20+ years reside there. It is a reproducing population.) Its location is not visually obvious to the general public. Owner is highly cooperative and chose not to drain the bog when informed of the turtles.

Special Status Species (attach EORs): Bog Turtle (Clemmys muhlenbergii)

Potential for other Special Status Species: None found; not likely to find others

Other noteworthy species or features present: None found; Not likely to find others

PHYSICAL DESCRIPTION

Cow Pasture

Locations and Directions:

From Dallas, travel North on Philadelphia Church Rd, SR 1001. Cross creek (Little Long Creek). Both sites are on Right side of road. After crossing the creek, turn Left into land owner's driveway & park out of the way. Cross road & barbed wire fence at mailboxes. # 1-1 to Left; # 1-2 cross trib. & to Right.

Landscape Description: Both sections are part of a cow pasture located north of Dallas, NC. Primary site # 1-1 is generally elliptical in shape and is enclosed on all sides by mixed hardwood-pine forest. An unnamed tributary (annual) flows into site from NW then, due to topography, some flow goes E to form a South flowing channel on East side which reconnects with main flow at Southern end of site. Much vegetative cover on both sides. Annex # 1-2 is smaller in size and is more open with some subterranean hydrology mid - to Easterly side.

Aspect: All **Slope:** 0-5% **Elevation (ft above MSL):** 720

Topographic Position: Lower Slope, Alluvial Flat

Hydrology: Terrestrial, Subterranean **Moisture:** Dry to Muddy All Year

Geology: Iphs, High Shoals Granite, Pennsylvanian (317 my)
Intrusive and Altered rocks, very light gray, coarse grained

Soils: Chewacla - Congaree (Ch - Co)

Comments on Physical Description:

Both sites at Friday Bog are in cow pasture. Has little animal traffic. Sites are connected by cow lane. # 1-1 is about 2.5 acres in size. # 1-2 is about 0.5 acres.
1-1 is more enclosed with mixed forest than # 1-2. A small unnamed perennial tributary feeds into # 1-1 on north side and flows south before partially channeling easterly and flowing across upper 1/4 of site to exit on east side into a channeled ditch. The stream continues to flow south where it reunites with main stream at south end. Confluence continues flowing in 4' deep ditch sided with vegetation into Long Creek. Tributary does not flow into # 1-2. # 1-2 has subterranean hydrology that eventually slowly flows into Long Creek several yards downstream of tributary of # 1-1. Both sites covered in thick vegetation - vascular and non-vascular. Both sites seem to be silting in, i.e. more solid ground is found now than 5 years ago. At # 1-1 vegetation is much thicker and taller than 5 years ago.

BIOLOGICAL DESCRIPTION

Friday Site Section # 1-1:
A. Western Piedmont Pasture/Meadow Bog; not in Schafale & Weakley; about 2-2.5 acres.
B & C. Site is surrounded by mixed pine-hardwood trees. Site where turtles are found is covered with pasture grasses, some Arundinaria gigantea, Juncus spp., Alnus serrulata and 2 small areas of Sphagnum moss. On short slope from forest to bog is blackberry, Smilax spp., Bull thistle and pasture grasses. Last spring the large clusters of tall Alnus serrulata were cut down by landowner with cuttings left in place. One multi-flora rose was cut also and does not seem to have returned.
D. Perennial unnamed tributary stream enters site on North end and flows South for several yards, then partially

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: A10 **NAME OF SITE:** Friday site, #1-1 & # 1-2 (primary site & annex)

divides with substream flowing easterly across upper 1/4 of site to channeled ditch on East side and then flows South. Main stream continues South and braids through lower 1/4 of site to reunite with eastern flow. Confluence then continues South to join with Long Creek. The ditch the confluence flows through has small hardwood trees on both sides and ditch is about 4' deep. It completely bypasses site # 1-2.

E. Increased growth and expansion of vegetation over the past two years has decreased the amount of actual wet areas and increased the amount of solid, dry ground. Vegetation is quite thick, which probably is of benefit to Bog Turtles but creates difficult monitoring situations. Suitable trapping areas no longer exist due to increases of vegetation and loss of mud flats. Cutting down of Alnus serrulata probably destroyed some nesting sites of Bog Turtles. Quality of site has deteriorated. Condition of site might be satisfactory for a Piedmont meadow bog.

F. Size of site is about 2.0 - 2.5 acres.

Friday Site # 1-2 (annex)

A. Same as above.

B & C. This section is in a more open environment than # 1-1. Vegetation structure is much the same as # 1-1; also with increased amount of vegetation and gain in dry solid ground accompanied by loss of wet areas. At both sites vegetation is thicker and taller. However, landowner did not cut down clusters of Alnus serrulata as at # 1-1. Vegetation is carpet-like and not vertically stratified.

D. Hydrology is subterranean with southeasterly flow into Long Creek downstream from confluence of tributary associated with
1-1.

E. Due to gain of dry ground and increased vegetation, quality of site has decreased. No Bog Turtles have been found there in 2-3 years.

F. Size of site is about 0.5 acres.

Site Integrity: Fair

Fire regime: Does not seem to be a problem, but a strong fire hazard probably exists considering the volume of vegetation there now. A controlled burn has been considered with inquiries about it to the local forest rangers and the landowner gave his permission but it was never acted on. A controlled burn might have held in check the now dominant vegetation.

Maximum DBH of canopy trees: NA

Average DBH of canopy trees: NA

Logged (y/n): No

Stream channelized (y/n): No

Even-aged canopy (y/n): No

Dredging/filling (y/n): No

Non-native / weedy species present (y/n): Yes

Understory cleared (y/n): No

Ditched/drained (y/n): Yes

Grazing (y/n): Yes

Comments on Biological Description:

Weeds present are Juncus spp., Arundinaria gigantea, Lonicera japonica, Rosa multiflora.
Ditch on east side of # 1-1
Cows

ADJACENT LAND USE: Continued pastureland on South and East sides. Small forest buffer on various perimeters.

PROTECTION / MANAGEMENT NEEDS:

Ron Altman of Catawba Lands Conservancy has met with landowner and introduced to him the idea of placing the sites into a land trust. No decision has been made yet by landowner. This idea should followed through on/continued with an additional offer to buy the sites. Recommend that the sites be continued as active pastureland. A controlled burn should be reconsidered in view of heavy vegetation now there. Erosion control measures might be in order at # 1-1 on South side where stream flow exits the site and continues to Long Creek.

DOCUMENTATION:

Bog Turtles found nowhere else in immediate vicinity. This based on walking surveys of property and immediate area.

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: A10 **NAME OF SITE:** Friday site, #1-1 & # 1-2 (primary site & annex)

Monitoring of both sites should continue indefinitely to monitor status of population.
No living individuals captured as specimens. Carapace of dead hatchling found and sent to N.C. State Museum of Natural History as voucher specimen. Isoetes spp. specimen collected and sent to UNCC.
Various general photo, slides, and video available at Schiele Museum.
Others knowledgeable about this site are Dennis Herman, Ann Somers, Jerry Reynolds, Jeff Beane, Bern Tryon, Tom Thorpe
Topo Map included with report.

PLANT SPECIES LIST:

CANOPY: Not applicable within sites.
SUBCANOPY: Not applicable.
SHRUBS: Alnus serrulata.
VINES: Lonicera japonica, Rosa multiflora, Smilax spp.
HERBS: Isoetes spp.

ANIMAL SPECIES LIST:

AMPHIBIANS: Two lined salamander, Rana spp., Bufo spp.
REPTILES: Queen snake, Northern water snake, Bog Turtle (Clemmys muhlenbergii), Mud Turtle (Kinosternon subrubrum), Box Turtle (Terrapene carolina), Snapping Turtle (Chelydra serpentina)
MAMMALS: tracks of raccoons

DATE: 08-Oct-98 **UPDATES:**

OWNER NAME: Private

Creek
Cem
Water Tank
Carr Sch
Dallas
City Hall
Lake
Cem
Gaston County Natural Heritage Inventory
December 1999
A10: Friday site, #1-1 & #1-2
(primary site & annex)
Gastonia North Quadrangle

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: A11 **NAME OF SITE:** Jenkins Site

Size: ca.1.5 ac. **Quadrangle:** Bessemer City
Province: PIEDMONT **Watershed:** Long Creek

Site Significance:
REGIONAL (This site is a second of two known Bog Turtle sites in Gaston County, NC. A known population of four adults has been found at this site. However, the population does not seem to be reproducing possibly due to estimated age of adults.

Special Status Species (attach EORs): Bog Turtle (Clemmys muhlenbergii)

Potential for other Special Status Species: None found

Other noteworthy species or features present: None found

PHYSICAL DESCRIPTION

Cow pasture

Locations and Directions:

From Bessemer City, travel North on NC 274; Left on SR 1405. Site is on Right immediately past 1st creek, which is a tributary to Long Creek. Site is in pasture area on Left side of creek about 100 yds from road. Turn into 1st residential driveway on Right (owner's house). Park near first building and walk through pasture. Site begins at hedgerow on Left near Alnus serrulata shrubs.

Landscape Description: The Jenkins Site is in a cow pasture/meadow on the West side of an unnamed tributary flowing into Long Creek NW of Bessemer City, NC. Annually, the pasture is mowed for hay. A short hedgerow marks the beginning of the site at which Bog Turtles #1 & #3 were found in 1993. Hedgerow runs generally E/W and is highlighted by a large dead tree. Site is wet to muddy throughout the year, with flooding during prolonged heavy rains.

Aspect: Flat, All **Slope:** Flat **Elevation (ft above MSL):** 780

Topographic Position: Alluvial Flat

Hydrology: Terrestrial, Subterranean **Moisture:** Wet to Muddy

Geology: Mcs, Intrusive & altered rocks, Muscovite-biotite granite; probably intrusive & a phase of altered rocks of the Cherryville Granite (Mc) Mississippian age? Geo. Map of the Charlotte 1x2 Quad., NC & SC, 1988, Goldsmith et al.

Soils: Chewacla - Congaree (Ch - Co), frequently to occasionally flooded

Comments on Physical Description:

Meadow is permanently wet with numerous mud flats & muddy pools found in grove of Alnus serrulata. Knee to hip high boots are required. During heavy rain, pasture can become flooded leaving behind silt. Small unnamed tributary flowing into Long Creek is clear with a sandy bottom and marks boundary with adjacent land owners. Fences are erected along the stream.

BIOLOGICAL DESCRIPTION

A. Western Piedmont pasture/meadow bog; not in Schafle & Weakley; ca. 0.5 acres.
B. Site is found in open cow pasture. Hedgerow has small variety of shrubs, Smilax, Alnus serrulata. Below (westward) hedgerow are found several clusters of tall Alnus serrulata, with some grasses & Smilax intermixed.
C. See B above.
D. Section where Alnus serrulata grows in abundance has subterranean hydrology that provides some water seepage into adjacent pasture between Alnus shrubs and hedgerow. A stream found only a few yards northward flows westerly to easterly. It is shallow with a sandy bottom. Some Alnus serrulata and a minor mixture of hardwoods grows along it. Stream floods during rain and deposits silt. Two Bog Turtles were discovered in the hedgerow; two others were found in the grove of Alnus serrulata, which is also muddy throughout the year. Mud flats within the Alnus are found during spring & early summer but become covered with vegetation in summer.
E. Quality of the site is satisfactory. With introduction of pasture an unknown number of years ago and its subsequent sowing of meadow grasses, the Bog Turtle population was probably profoundly interrupted. The closeness of the grasses as they grow probably acted as a barrier for turtle movement. This may have caused a severe decline in the population and eliminated a reproductive population. Subsequent use of tractors and

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: A11 **NAME OF SITE:** Jenkins Site

machinery to harvest the hay probably was also detrimental to the turtles. Future management may include building a fence to confine the hedgerow and Alnus grove. Subsequent removal of the grasses within that small area will allow free movement of the turtles. Constant maintenance of the clearing would be required.
F. Size ca. 0.5 acres or so.

Site Integrity: Good **Fire regime:** Fire probably not a problem due to wetness of area. No evidence of past burning.

Maximum DBH of canopy trees: Shrubs, 4"-6" **Average DBH of canopy trees:** Shrubs, 2"-3"

Logged (y/n): No **Stream channelized (y/n):** No

Even-aged canopy (y/n): No **Dredging/filling (y/n):** No

Non-native / weedy species present (y/n): Yes **Understory cleared (y/n):** No

Ditched/drained (y/n): No **Grazing (y/n):** Yes

Comments on Biological Description:

Weeds present are various pasture/meadow grasses, Smilax spp., some blackberry, Alnus serrulata.
Cows.

ADJACENT LAND USE: Pastureland

PROTECTION / MANAGEMENT NEEDS:

Recommend that landowners be contacted about putting the site into some type of protective/conservation status such a land easement or outright purchase.
Recommend that site be continued as an active part of the cow pasture with continued periodic mowing of grass for hay on its traditional schedule per landowners.

DOCUMENTATION:

Adjacent land investigated for other Bog Turtle. None were found.
Monitoring of site needs to continue to ascertain status of known turtles and to determine reproductive status.
Due to the endangered status of Bog Turtles, no specimens have been collected nor have body parts of dead turtles been found.
Color slides of the site have been made and are available at Schiele Museum.
Others knowledgeable about the site are Dennis Herman, Ann Somers
Topo map attached.

PLANT SPECIES LIST:

CANOPY: Not applicable to this site.
SUBCANOPY: Not applicable.
SHRUBS: Alnus serrulata.

ANIMAL SPECIES LIST:

REPTILES: Unidentified snake, E. Painted Turtle, E. Mud Turtle (Kinosternum subrubrum)
AMPHIBIANS: locally typical, Rana & Bufo spp.

DATE: 08-Oct-98 **UPDATES:**

OWNER NAME: Private

Gaston County Natural Heritage Inventory
December 1999

A11: Jenkins Site
Bessemer City Quadrangle

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: A12 **NAME OF SITE:** Forney Rankin/Redlair Preserve

Size: 630 acres **Quadrangle:** Mt. Holly
Province: PIEDMONT **Watershed:** South Fork Catawba

Site Significance:
REGIONAL (Mesic Mixed Hardwood Forest contains Magnolia macrophylla, and the land is wholly under a conservation easement with the Catawba Lands Conservancy.

Special Status Species (attach EORs): Magnolia macrophylla

Potential for other Special Status Species:

Other noteworthy species or features present:

PHYSICAL DESCRIPTION

Locations and Directions:

W of Hickory Grove Rd (SR 2000), S of Jct. with Spargo St.

Landscape Description: A rolling landscape of pines, hardwoods and cultivated fields situated in a wide bend of the South Fork River.

Aspect: All **Slope:** Flat, 0-5-10-35 **Elevation (ft above MSL):** 620-800

Topographic Position: Alluvial Flat, Upland Flat, Upper/Mid/Lower Slopes, Crest

Hydrology: Terrestrial, Palustrine **Moisture:** Dry Mesic, Mesic, Wet Mesic

Geology: Mvf - Felsic metavolcanic rock; Zbs - Quartz-sericite schist

Soils: CeB2, CfB, CfD, CH, Co, GaB2, GaD2, PaD2, PaE, PaF, TaD, TaE

Comments on Physical Description:

BIOLOGICAL DESCRIPTION

A. Mesic Mixed Hardwood Forest, Dry Oak-Hickory Forest, Dry-Mesic Oak-Hickory Forest.
B. Typical canopy trees include Quercus alba, Q. rubra, Fagus grandifolia and Liriodendron tulipifera. The understory has Magnolia macrophylla, Cornus florida, Acer rubrum and Ilex opaca. Further investigation is needed.
C. Dominants vary according to habitat. Further investigation is needed.
D. The landscape rises from the South Fork River, a wet mesic area containing a Mixed Mesic Hardwood Forest into a mesic and dry mesic area with the Dry Oak-Hickory and Dry-Mesic Oak-Hickory Forest.
E. These areas have been selectively timbered and impacted over the years. However, further investigation is needed to determine quality and condition.
F. 630 acres.

Site Integrity: Good **Fire regime:**

Maximum DBH of canopy trees: Unknown **Average DBH of canopy trees:** Unknown

Logged (y/n): Yes **Stream channelized (y/n):** No

Even-aged canopy (y/n): No **Dredging/filling (y/n):** No

Non-native / weedy species present (y/n): Yes **Understory cleared (y/n):** Yes

Ditched/drained (y/n): No **Grazing (y/n):** Yes

Comments on Biological Description:

ADJACENT LAND USE: Agricultural, Residential

PROTECTION / MANAGEMENT NEEDS:

Conservation easement with the Catawba Lands Conservancy.

DOCUMENTATION:
UNCC

PLANT SPECIES LIST:
CANOPY: Quercus alba, Q, rubra, Fagus grandifolia, Liriodendron tulipifera. (Further investigation is needed.)
SUBCANOPY: Magnolia macrophylla, Cornus florida, Acer rubrum, and Ilex opaca. (Further investigation is

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

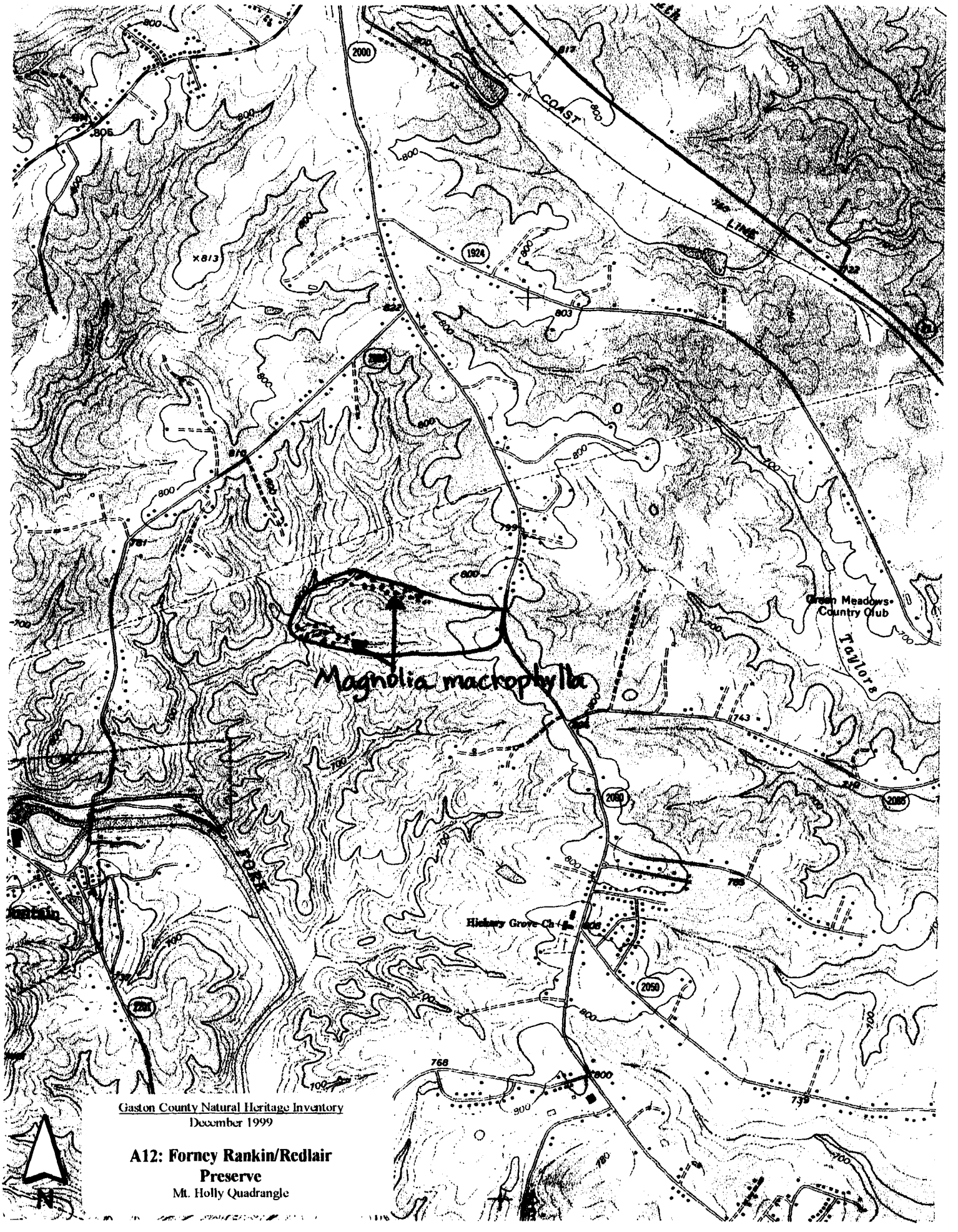
SITE NUMBER: A12 **NAME OF SITE:** Forney Rankin/Redlair Preserve

needed.)
SHRUBS: Further investigation is needed.
HERBS: Further investigation is needed.
VINES: Further investigation is needed.
FERNS: Further investigation is needed.

ANIMAL SPECIES LIST:

DATE: 07-Jun-96 **UPDATES:**

OWNER NAME: Private



Gaston County Natural Heritage Inventory
December 1999

A12: Forney Rankin/Redlair Preserve
Mt. Holly Quadrangle

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B01 **NAME OF SITE:** Riverbend Peninsula Forest

Size: 4 acres **Quadrangle:** Mtn. Island Lake
Province: PIEDMONT **Watershed:** Johnson Creek & W Side Catawba

Site Significance:
COUNTY (This site has a large American chestnut, Castanea dentata, (ca. 12" DBH), which is producing fruit. It shows evidence of blight, but must have resistance to be of such a size.)

Special Status Species (attach EORs):

Potential for other Special Status Species: Poor

Other noteworthy species or features present: Castanea dentata (ca. 12" DBH flowers, fruits

PHYSICAL DESCRIPTION

Steep, NE facing slope.

Locations and Directions:

From Rozzelle bridge over Catawba River, N on Lucia River Hwy, SR 16, to Horseshoe Bend Beach Rd, SR 1912. Proceed E (ca. 2.0 miles) to sharp Right bend in road. Site is (ca. 1000 map Ft. NE).

Landscape Description:

Aspect: NE **Slope:** 10-35+ **Elevation (ft above MSL):** 650-750

Topographic Position: Upper/Mid/Lower Slopes

Hydrology: Terrestrial **Moisture:** Dry Mesic

Geology: Mqd - Metamorphosed quartz diorite & tonalite

Soils: PaF-Pacolet sandy loam, 25-45% slope

Comments on Physical Description:

This is a NE facing slope along the shores of Mtn. Island Lake between 650-750 ft. in elevation.
Update from Jim Green on 28-Aug-98:
-A new 2-rail split fence has been put into place around at least a good portion of the land; some roads had been cut into the property with their surface graveled over.
-Some men with trucks and equipment were chopping and spraying straw over one of the bulldozed areas.
-Another man with a tractor and blade or something, was scraping the "beach area" at the bottom of the hill. Sand had been brought in and dumped there to expand the area of the beach.
-A water pump with 2" piping had been set up to irrigate other parts of the land where grass had been sown.
-The hillside where the American Chestnut tree grows had not been tampered with and still looked good.

BIOLOGICAL DESCRIPTION

A. This site is a mixture of a Mesic Mixed Hardwood Forest and Dry-Mesic Oak-Hickory Forest of the Piedmont subtype.
B. Fagus grandifolia, Quercus rubra and Acer rubrum are typical canopy trees of a Mesic Mixed Hardwood Forest. Carya spp. and Liquidambar styraciflua are common Dry-Mesic Oak-Hickory Forest canopy species. A mixed shrub layer exists with mesic species such as Hamamelis virginiana, Cornus amomum and Rhododendron nudiflorum; and xeric species like Ilex opaca. The herbaceous layer present suggests a moist slope with the presence of Viola tripartita, Sanguinaria canadensis, Galium spp. and Cardamine concatenata.
C. Dominant canopy tree was Fagus grandifolia, probably due to its low timber value. Halesia carolina, Amorpha glabra, Hibiscus moscheutos and the relatively large Castanea dentata add value to the site's integrity. This site also has a fairly diverse and interesting herbaceous layer.
D. The relative position of this site is downhill form a Dry-Mesic Oak-Hickory Forest and uphill from the much more mesic environment of the Mtn. Island Lake Floodplain.
E. Uphill from the site along the crest of the hill has been logged in the past. Evidence of ORV traffic exists. Otherwise this site has good integrity and diversity. Crescent Resources may be willing to negotiate parts of this site for preservation.
F. The site is (ca. 900 map ft. x 200 map ft.) approx. 4 acres.

Site Integrity: Fair to good **Fire regime:**

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B01 **NAME OF SITE:** Riverbend Peninsula Forest

Maximum DBH of canopy trees: 17" **Average DBH of canopy trees:** 13"

Logged (y/n): Yes **Stream channelized (y/n):** No

Even-aged canopy (y/n): No **Dredging/filling (y/n):** No

Non-native / weedy species present (y/n): No **Understory cleared (y/n):** No

Ditched/drained (y/n): No **Grazing (y/n):** No

Comments on Biological Description:

ORV damage. Many herbs present, indicative of a good, rich, moist forest.

ADJACENT LAND USE: Power Generation & Transmission (Duke Power Co.).

PROTECTION / MANAGEMENT NEEDS:

Site's steep slope is not likely to be developed, but is available for sale.

DOCUMENTATION:

Priority for further survey: Needs survey during fall season. Specimens collected - UNCC Herbarium.

PLANT SPECIES LIST:

CANOPY: Quercus rubra, Q. alba, Carya spp., Fagus grandifolia, Liquidambar styraciflua.
SUBCANOPY: Oxydendrum arboreum, Castanea dentata, Cornus florida, Halesia carolina, Cercis canadensis, Juniperus virginiana, Acer rubrum.
SHRUBS: Amorpha glabra, Ilex opaca, Hamamelis virginiana, Cornus amomum, Rhododendron nudiflorum, Sassafras albidum, Prunus serotina.
VINES: Matalea spp.
HERBS: Cardamine concatenata, Galium spp., Aquilegia canadensis, Hepatica americana, Lamium purpureum, Stellaria pubera, Conopholis americana, Antennaria spp., Sanguinaria canadensis, Smilacina racemosa, Viola tripartita var. glaberrima, Linaria canadensis, Fragaria virginiana, Narcissus poetica, Amsonia tabernaemontana, Hibiscus moscheutos.
FERNS: Polystichum acrostichoides, Asplenium platyneuron.

ANIMAL SPECIES LIST:

DATE: 17-Mar-96 **UPDATES:** 03-April-96, 10-April-96, 16-April-96, 21-April-96, 01-Ma

OWNER NAME: Private

Gaston County Natural Heritage Inventory

December 1999

B01: Riverbend Peninsula Forest

Mtn. Island Lake Quadrangle

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B02 **NAME OF SITE:** Saddler Road

Size: ca. 23 ac. **Quadrangle:** Lowesville
Province: PIEDMONT **Watershed:** Leepers Creek

Site Significance:
COUNTY (Good species diversity and presence of Panax quinquefolium.)

Special Status Species (attach EORs): Panax quinquefolium (15+ plants)

Potential for other Special Status Species:

Other noteworthy species or features present:

PHYSICAL DESCRIPTION

A NE facing slope above a small drainage.

Locations and Directions:

From Stanley, take Mariposa Rd, SR 1902, then Left on Alexis-Lucia Rd, SR 1820. Site is North of Alexis-Lucia Rd and West of Saddler Rd.

Landscape Description:

Aspect: NE **Slope:** 15-45% **Elevation (ft above MSL):** 720-800

Topographic Position: Upper/Mid/Lower Slopes

Hydrology: Terrestrial **Moisture:** Mesic, Dry Mesic

Geology: Zbs - Quartz-sericite schist

Soils: CH, PaE, PaF

Comments on Physical Description:

BIOLOGICAL DESCRIPTION

A. Mesic Mixed Hardwood Forest.
B. Canopy, subcanopy, shrub and herb layers are well developed, with a good diversity of species at all levels.
C. The canopy is dominated by Liriodendron tulipifera, Fagus grandifolia, Quercus rubra and Q. alba. The subcanopy has Acer rubrum, Cornus florida, Oxydendrum arboreum, Carpinus caroliniana and Tilia heterophylla. The shrub layer contains Asimina triloba, Rhododendron nudiflorum, Kalmia latifolia, Lindera benzoin and Styrax grandifolia. The herb layer is notable for the presence of Panax quinquefolium.
D. This area is below a hill crest which has been disturbed and is in succession and grades into a Piedmont Bottomland Forest.
E. The site has fair to good integrity and a good species diversity.
F. ca. 23 acres.

Site Integrity: Fair to good **Fire regime:** None noted.

Maximum DBH of canopy trees: 23" **Average DBH of canopy trees:** 15"

Logged (y/n): No **Stream channelized (y/n):** No

Even-aged canopy (y/n): No **Dredging/filling (y/n):** No

Non-native / weedy species present (y/n): Yes **Understory cleared (y/n):** No

Ditched/drained (y/n): No **Grazing (y/n):** No

Comments on Biological Description:

Crests of slopes previously disturbed, i.e. successional forest, presence of Pinus spp. Previous land use probable farmland or pastures. Presence of Panax quinquefolium adds significance to this site. 11-50 Panax individuals in 3 patches (shown on map). The site as a whole has good species diversity: 8 or more ferns, many herbs etc.

ADJACENT LAND USE: Residential

PROTECTION / MANAGEMENT NEEDS:

DOCUMENTATION:

Should this site be investigated further? Yes, perhaps to extend the boundaries of the site.

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B02 **NAME OF SITE:** Saddler Road

Additional Comments: Map and Species list attached.

PLANT SPECIES LIST:

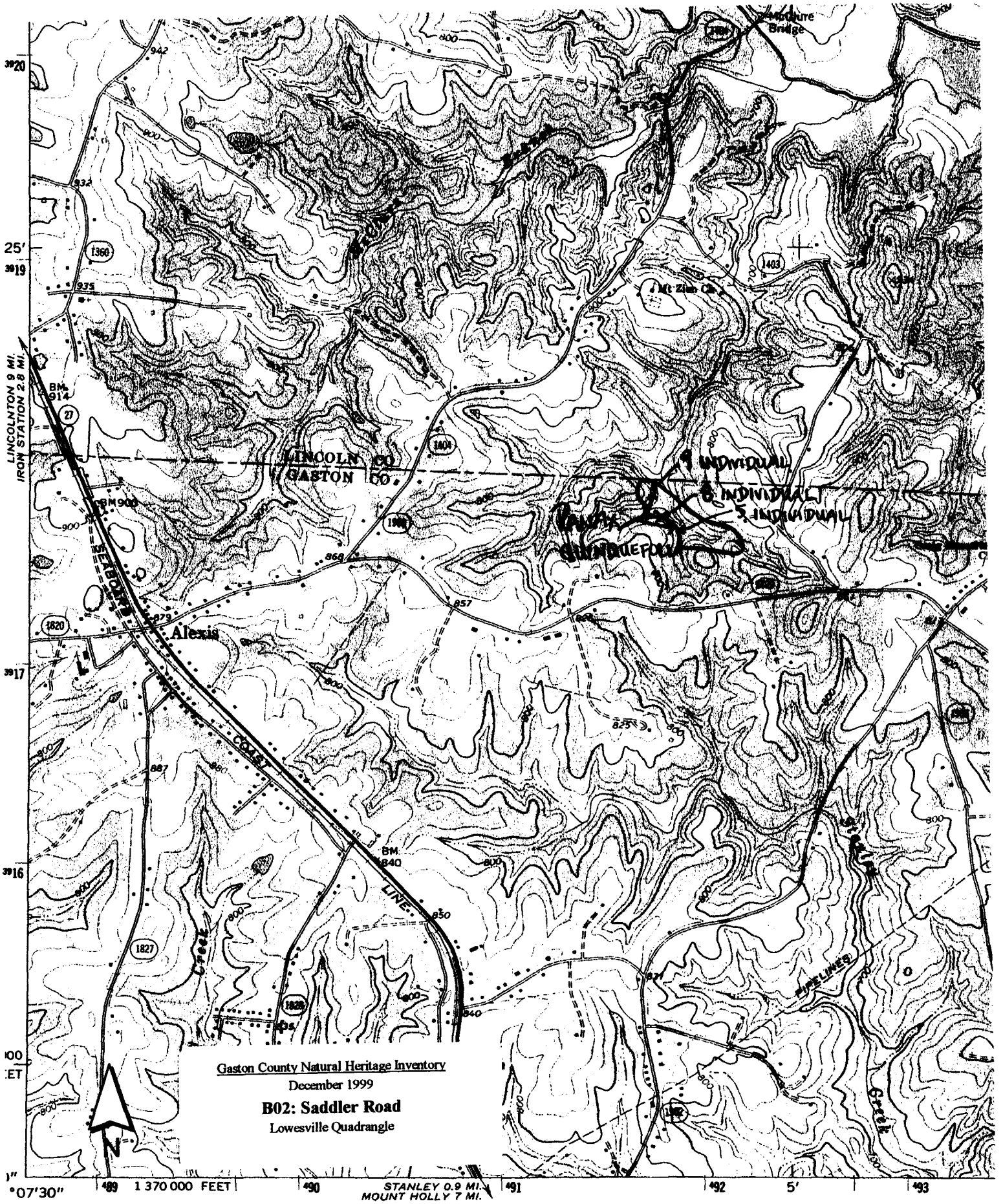
CANOPY: Liriodendron tulipifera, Liquidambar styraciflua, Pinus echinata, P. virginiana, Nyssa sylvatica, Fagus grandifolia, Quercus rubra, Q. alba.
SUBCANOPY: Acer rubrum, Cornus florida, Liquidambar styraciflua, Liriodendron tulipifera, Carpinus caroliniana, Oxydendrum arboreum, N. sylvatica, Tilia heterophylla.
SHRUBS: Ilex opaca, Euonymus americanus, Asimina triloba, Cercis canadensis, Morus rubra, Castanea dentata, Rhododendron nudiflorum, Styrax grandifolia, Viburnum prunifolium, Cornus amomum, Kalmia latifolia, Xanthorhiza simplicissima, Lindera benzoin, Elaeagnus umbellata, Chionanthus virginicus.
VINES: Vitis rotundifolia, Smilax spp., Parthenocissus quinquefolia, Dioscorea villosa, Toxicodendron radicans.
HERBS: Polygonatum biflorum, Microstegium vimineum, Acorus calamus, Sagittaria spp., Galium spp., Hepatica americana, Sanguinaria canadensis, Tiarella cordifolia var. collina, Thalictrum thalictroides, Cimicifuga racemosa, Smilacina racemosa, Aristolochia serpentaria, Trillium catesbaei, Collinsonia canadensis, Desmodium spp., Oxalis grandis, Podophyllum peltatum, Goodyera pubescens, Prenanthes spp., Mitchella repens, Arisaema triphyllum, Chamaelirium luteum, Iris cristata, Impatiens capensis, Cynoglossum virginianum, Geranium spp., Panax quinquefolium , Medeola virginiana, Aruncus dioicus, Ranunculus recurvatus, Epifagus virginiana, Heuchera americana.
FERNS: Thelypteris noveboracensis, T. hexagonoptera, Athyrium asplenioides, Polystichum acrostichoides, Woodwardia areolata, Asplenium platyneuron, Botrychium virginianum, Adiantum pedatum, Lycopodium flabelliforme, L. lucidulum.

ANIMAL SPECIES LIST:

Ovenbird nest, Many "hanging flies" (order Mecoptera), Dark Wing Damselfly

DATE: 30-May-96 **UPDATES:**

OWNER NAME: Private



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Topography by photogrammetric methods from aerial

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B03 **NAME OF SITE:** Airport Road East

Size: 70 acres **Quadrangle:** Lowesville
Province: PIEDMONT **Watershed:** Dutchmans Creek

Site Significance:
COUNTY (Large population of Magnolia macrophylla.)

Special Status Species (attach EORs): Magnolia macrophylla (Large population)

Potential for other Special Status Species:

Other noteworthy species or features present: Kalmia (old in years), Corylus cornuta, Styrax

PHYSICAL DESCRIPTION

Locations and Directions:

SR 27 in Stanley, N on Mariposa Rd, SR 1902. Site is N of Junction of Mariposa Rd and Airport Rd. From Stanley, take SR 1902 (Mariposa Rd.). Site is on Left approx. 1/2mile past SR 1903.

Landscape Description: Steep to moderate slopes and flood plain, and a sheltered cove. General Description: This is a diverse site. The Eastern portion is highly disturbed with Kudzu and has had some timbering. Beginning NE of the hayfield the integrity improves with stands of old growth Kalmia and fairly large trees on the slope. SW of the hayfield is a cove that again has old growth, Kalmia and a large population of Magnolia macrophylla.

Aspect: N, E, W **Slope:** Flat, 0-5-10-35 **Elevation (ft above MSL):** 720-800

Topographic Position: Upper/Mid/Lower Slopes, Alluvial Flat

Hydrology: Terrestrial **Moisture:** Mesic, Dry Mesic

Geology: Zbs - Quartz-sericite schist

Soils: PaE-Pacolet sandy loam, 15-25% slopes; CH Chewacla loam

Comments on Physical Description:

Good NW facing slope.

BIOLOGICAL DESCRIPTION

A. Mesic Mixed Hardwood Forest.
B. A well-developed canopy, subcanopy, shrub and herb layer with a lot of species diversity. The slopes and cove are of particular interest.
C. The dominant canopy species include: Quercus alba, Q. falcata, Fagus grandifolia, Liriodendron tulipifera, Liquidambar styraciflua, Acer rubrum and Pinus echinata. The subcanopy consists of a large population of Magnolia macrophylla. The shrub layer is very diverse, as is the herb layer.
D. The site is nestled in a ravine between agricultural and residential areas.
E. The site integrity is good due to the topography, but it is isolated vegetatively. However, the population of M. macrophylla is very large.
F. 70 acres.

Site Integrity: Good **Fire regime:** None observed.

Maximum DBH of canopy trees: 24" **Average DBH of canopy trees:** 19"

Logged (y/n): No **Stream channelized (y/n):** No

Even-aged canopy (y/n): No **Dredging/filling (y/n):** No

Non-native / weedy species present (y/n): No **Understory cleared (y/n):** No

Ditched/drained (y/n): No **Grazing (y/n):** No

Comments on Biological Description:

Good fern and herb diversity. One of nicest groves of Magnola macrophylla in the county.

ADJACENT LAND USE: Residential, Timber

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B03 **NAME OF SITE:** Airport Road East

PROTECTION / MANAGEMENT NEEDS:

This site soon might be bound for real estate development.

DOCUMENTATION:

UNCC Herbarium

PLANT SPECIES LIST:

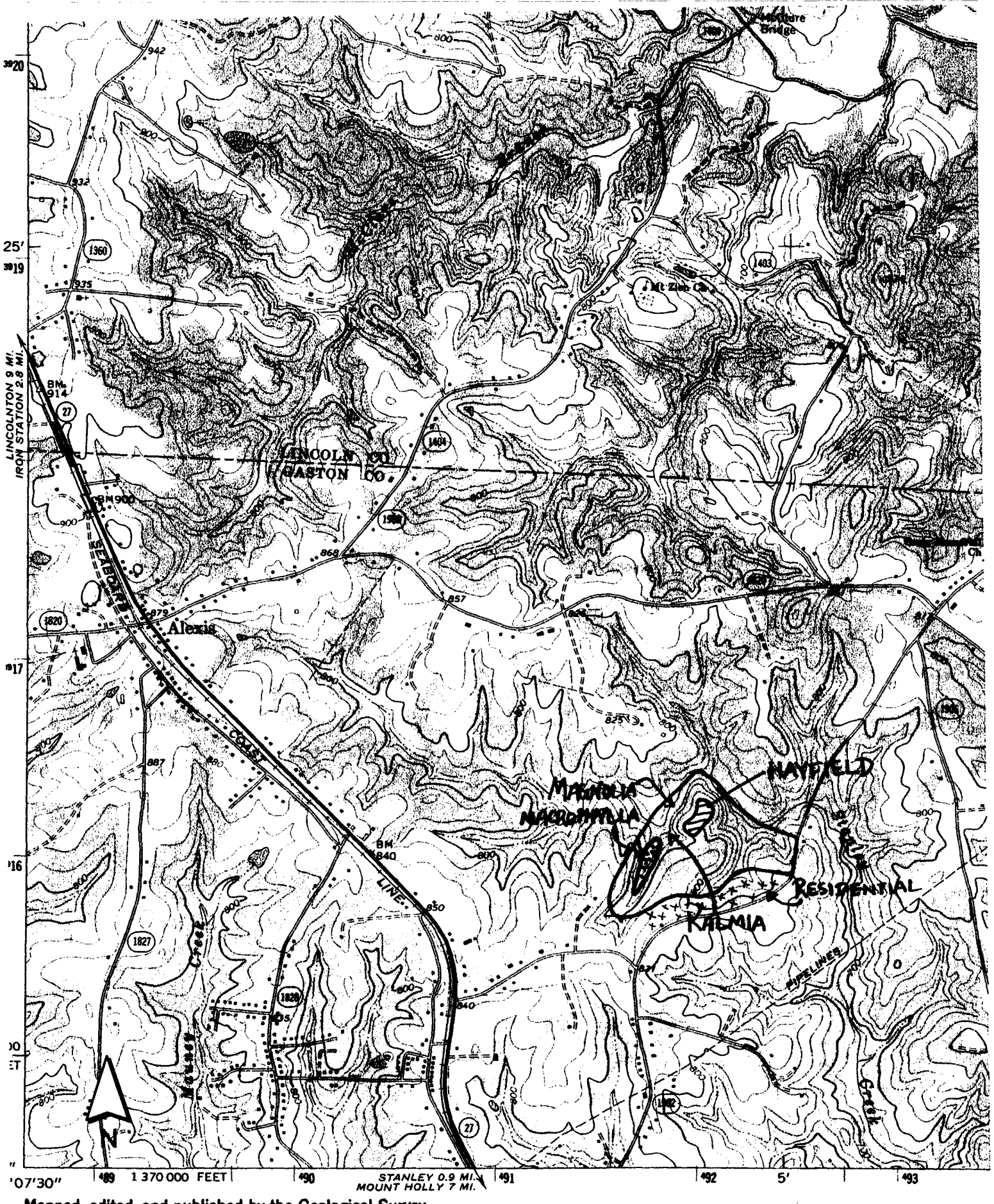
CANOPY: Quercus alba, Q. falcata, Liriodendron tulipifera, Liquidambar styraciflua, Pinus echinata, Fagus grandifolia, Acer rubrum, Carya ovata.
SUBCANOPY: Carpinus caroliniana, Oxydendrum arboreum, Morus rubra, Cornus florida, Magnolia macrophylla.
SHRUBS: Kalmia latifolia, Nyssa sylvatica, Euonymus americanus, Styrax americana, Xanthorhiza simplicissima, Castanea dentata, Sambucus canadensis, Sassafras albidum, Asimina triloba, Magnolia macrophylla, Rhododendron nudiflorum, Amelanchier spp., Symplocos tinctoria, Vaccinium spp., Ilex opaca, Lindera benzoin, Corylus cornuta.
VINES: Smilax ecirrhata, Vitis rotundifolia, Dioscorea villosa, Parthenocissus quinquefolia, Toxicodendron radicans, Campsis radicans.
HERBS: Smilacina racemosa, Tiarella cordifolia, Hexastylis arifolia, Hexastylis minor, Impatiens capensis, Sagittaria latifolia, Eupatorium fistulosum, Hepatica americana, Geranium maculatum, Collinsonia canadensis, Medeola virginiana, Goodyera pubescens, Microstegium vimineum, Cimicifuga racemosa, Galium spp., Sanguinaria canadensis, Trillium catesbaei, Desmodium spp., Prenanthes spp., Thalictrum thalictroides, Mitchella repens, Chimaphila maculata, Chamaelirium luteum, Houstonia spp., Sisyrinchium angustifolium, Hypoxis hirsuta, Polygonatum biflorum, Uvularia perfoliata, Amianthum muscaetoxicum, Aureolaria spp., Scutellaria integrifolia, Heuchera americana, Thalictrum revolutum, Pedicularis canadensis, Coreopsis auriculata, Chrysogonum virginianum, Elephantopus tomentosus, Hieracium venosum, Asclepias spp., Penstemon laevigatus.
FERNS: Polystichum acrostichoides, Athyrium asplenioides, Thelypteris noveboracensis, Adiantum pedatum, Osmunda cinnamomea, Thelypteris hexagonoptera, Botrychium virginianum, Osmunda regalis, Lycopodium flabelliforme.

ANIMAL SPECIES LIST:

Slimy salamander, Scorpion fly (specimen)

DATE: 30-May-96 **UPDATES:**

OWNER NAME: Private



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Topography by photogrammetric methods from aerial

Gaston County Natural Heritage Inventory

December 1999

B03: Airport Road East

Lowesville Quadrangle

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SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B04 **NAME OF SITE:** Rhyne Farm

Size: 12 acres **Quadrangle:** Mt. Holly
Province: PIEDMONT **Watershed:** Dutchmans Creek

Site Significance:
COUNTY (Large populations of Magnolia macrophylla and Acorus calamus.)

Special Status Species (attach EORs): Magnolia macrophylla

Potential for other Special Status Species:

Other noteworthy species or features present: Magnolia tripetella, Styrax, Trillium cernuum, Onoclea, Arisaema dracontium, Leucothe

PHYSICAL DESCRIPTION

Locations and Directions:

East on Stanley-Lucia Rd. Just before crossing Stanley Creek - Historic house on Left.

Landscape Description: 12 acres near Rhyne house protected as historical site.

Aspect: E, NE **Slope:** 0-30 degrees **Elevation (ft above MSL):** 640-740

Topographic Position: Upper/Mid/Lower Slopes

Hydrology: Terrestrial, Palustrine **Moisture:** Dry to Seasonally Wet

Geology:

Soils: CH, GaB2, GaD2, WkF

Comments on Physical Description:

Presence of a good wetland.

BIOLOGICAL DESCRIPTION

A. Due to past management as a farm (200 years), there is no undisturbed community. But it is close to a Mesic Mixed Hardwood Forest.
B. The upper slope canopy is dominated by Fagus grandifolia, Quercus alba, Nyssa sylvatica and Pinus virginiana. The lower slope dominants become Quercus michauxii and Platanus occidentalis. The site then passes into a seasonally flooded area dominated by Acorus calamus.
C. Canopy - Fagus grandifolia is the prime dominant; but present also is Quercus alba, Nyssa sylvatica and Pinus virginiana. Slope dominants are Q. michauxii and Platanus occidentalis.
Subcanopy - Magnolia macrophylla is the prime species (large population). Other species include Betula nigra, Oxydendrum arboreum, Ilex opaca, Morus rubra and Carpinus caroliniana.
Shrubs - Asimina triloba, Lindera benzoin, Viburnum prunifolium, Sambucus canadensis, Styrax grandifolia, Hamamelis virginiana, Rhododendron nudiflorum and Cercis canadensis.
D. Isolated slope and seasonally flooded site on an historic farm.
E. Fair for the area, but a well-preserved sweet flag population and a large population of Magnolia macrophylla with large dbh (11.2", 10.4", 12.2", 12.3", 13.7").
F. 12 acres.

Site Integrity: Fair **Fire regime:**

Maximum DBH of canopy trees: 26" **Average DBH of canopy trees:** 15"

Logged (y/n): No **Stream channelized (y/n):** No

Even-aged canopy (y/n): No **Dredging/filling (y/n):** No

Non-native / weedy species present (y/n): No **Understory cleared (y/n):** No

Ditched/drained (y/n): No **Grazing (y/n):** No

Comments on Biological Description:

N and W of the site, on the South bank of Stanley Creek, are two North flowing tributaries, both of which have Magnolia macrophylla with Magnolia tripetela. Good herb diversity.

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B04 **NAME OF SITE:** Rhyne Farm

ADJACENT LAND USE:

PROTECTION / MANAGEMENT NEEDS:

Site is protected as historical.

DOCUMENTATION:

Should this site be investigated further? Yes. Wetland should be observed during other seasons.

PLANT SPECIES LIST:

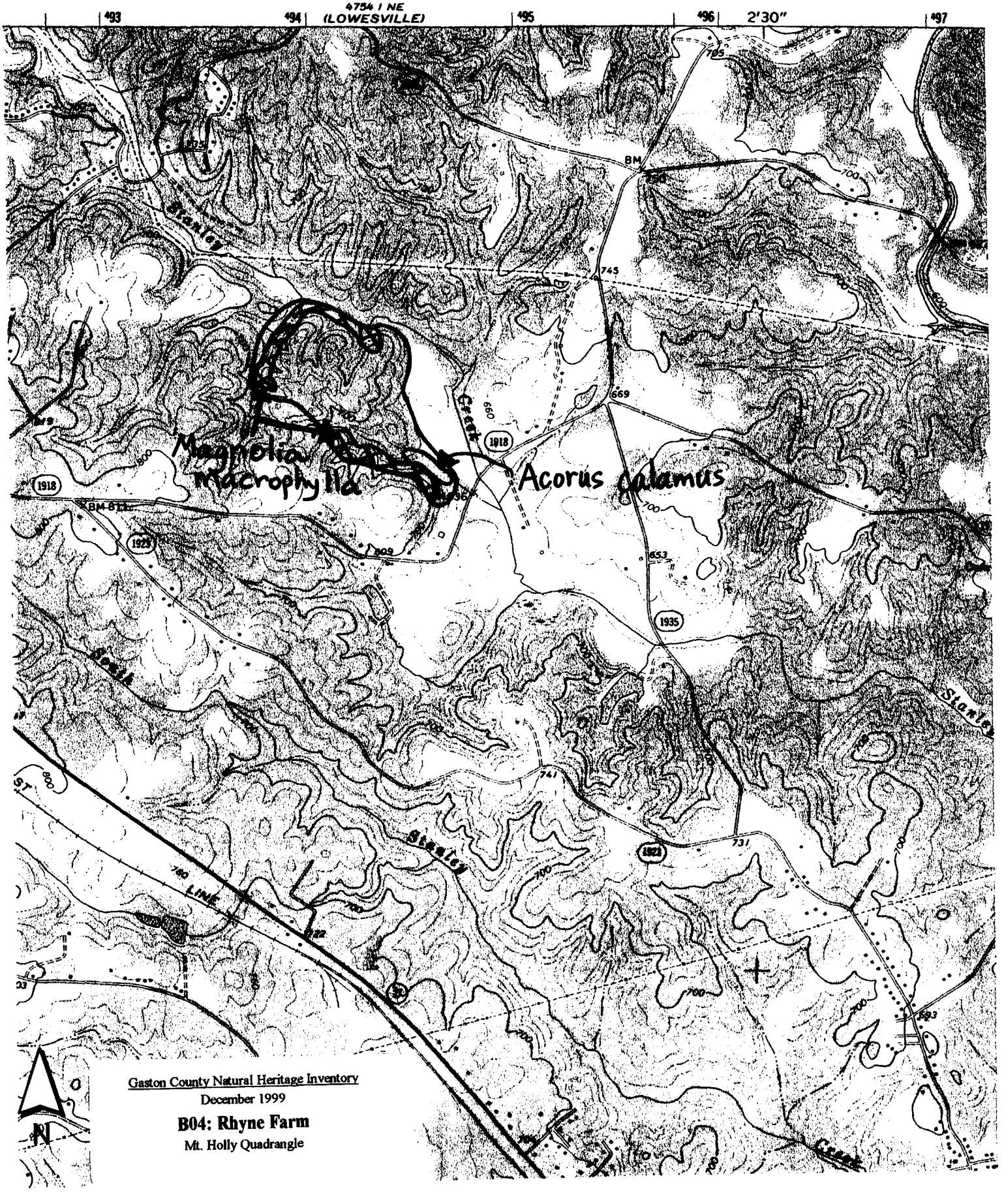
CANOPY: Fagus grandifolia, Nyssa sylvatica, Quercus alba, Pinus virginiana, Platanus occidentalis, Q. michauxii.
SUBCANOPY: Magnolia macrophylla, (28.5, 34.7, 26.3, 31.0, 31.2 cm. DBH), Alnus serrulata, Carpinus caroliniana, Juniperus virginiana, Morus rubra, Ilex opaca, Betula nigra, Magnolia tripetala, Oxydendrum arboreum
SHRUBS: Asimina triloba, Lindera benzoin, Viburnum prunifolium, Diospyros virginiana, Sambucus canadensis, Styrax grandifolia, Hamamelis virginiana, Ilex decidua, Rhododendron nudiflorum, Cercis canadensis, Crataegus spp., Xanthorhiza simplicissima, Leucothoe axillaris var. editorum, Vaccinium spp., Corylus americana, Calycanthus floridus.
VINES: Smilax herbacea, Campsis radicans, Dioscorea villosa, Parthenocissus quinquefolia, Rhus toxicodendron, Vitis rotundifolia.
HERBS: Acorus calamus, Conium maculatum, Vernonia spp., Sagittaria spp., Alisma subcordatum, Sanquinaria canadensis, Sanicula spp., Galium spp., Desmodium spp., Microstegium vimineum, Oxalis spp., Impatiens capensis, Ranunculus spp., Smilacina racemosa, Thalictrum thalictroides, Chimaphila maculata, Thalictrum revolutum, Hepatica americana, Tiarella cordifolia var. collina, Podophyllum peltatum, Sisyrinchium angustifolium, Iris cristata, Trillium cernuum, Arisaema triphyllum, Pedicularis canadensis, Scutellaria integrifolia, Collinsonia canadensis, Geranium maculatum, Polygonatum biflorum, Epifagus virginiana, Mitchella repens, Aureolaria virginica, Chamaelirium luteum, Cacalia atriplicifolia, Hexastylis arifolia, Hexastylis minor, Chrysogonum virginianum var. australe, Uvularia perfoliata, Arisaema dracontium.

ANIMAL SPECIES LIST:

DATE: 12-Jun-96 **UPDATES:** 71

OWNER NAME: Private

STATE OF NORTH CAROLINA
DEPARTMENT OF NATURAL AND ECONOMIC RESOURCES
RALEIGH, NORTH CAROLINA



Gaston County Natural Heritage Inventory
December 1999
B04: Rhyne Farm
Mt. Holly Quadrangle

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B05 **NAME OF SITE:** Stanley Creek

Size: 60 acres **Quadrangle:** Lowesville
Province: PIEDMONT **Watershed:** Dutchmans Creek

Site Significance:
COUNTY

Special Status Species (attach EORs):
Potential for other Special Status Species:
Other noteworthy species or features present:

PHYSICAL DESCRIPTION

Locations and Directions:

From Stanley, take SR 1902 (Mariposa Rd). Site begins where Mariposa Rd crosses Stanley Creek. The site follows Stanley Creek South, across gas line right of way.

Landscape Description: Lower slope above Stanley Creek with agiculture on crests; gas line ROW bisects site.

Aspect: W, N **Slope:** 15-25 degrees **Elevation (ft above MSL):** 680-720

Topographic Position: Lower and Mid Slopes

Hydrology: Terrestrial **Moisture:** Dry Mesic

Geology: Zbvf

Soils: PaE

Comments on Physical Description:

BIOLOGICAL DESCRIPTION

A. Dry-Mesic Oak-Hickory Forest.
B. The canopy shows a succession from past disturbance being dominated by Liquidambar styraciflua, Pinus echinata, Liriodendron tulipifera, Quercus alba, Q. falcata, Carya glabra and Platanus occidentalis in the lower slope. The subcanopy has Magnolia macrophylla up to 8.6" and 20.1" DBH. Other subcanopy species include Oxydendrum arboreum, Cornus florida, Acer rubrum, Betula nigra and Nyssa sylvatica. The shrub layer is well-developed, particularly along the stream, with a large population of Leucothoe axillaris Var. editorum. Other species are included in the species list. The herbaceous layer is well-developed and includes a small population of Trautvetteria carolinensis. Other taxa are in the species list.

Site Integrity: **Fire regime:**

Maximum DBH of canopy trees: **Average DBH of canopy trees:**

Logged (y/n): No **Stream channelized (y/n):** No

Even-aged canopy (y/n): No **Dredging/filling (y/n):** No

Non-native / weedy species present (y/n): No **Understory cleared (y/n):** No

Ditched/drained (y/n): No **Grazing (y/n):** No

Comments on Biological Description:

ADJACENT LAND USE:

PROTECTION / MANAGEMENT NEEDS:

DOCUMENTATION:

22.8" DBH M. macrophylla (cut) was determined to be 55 years old by counting growth rings. UNCC.

PLANT SPECIES LIST:

CANOPY: Liquidambar styraciflua, Pinus echinata, Liriodendron tulipifera, Quercus alba, Q. falcata, Platanus occidentalis, Carya glabra.

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

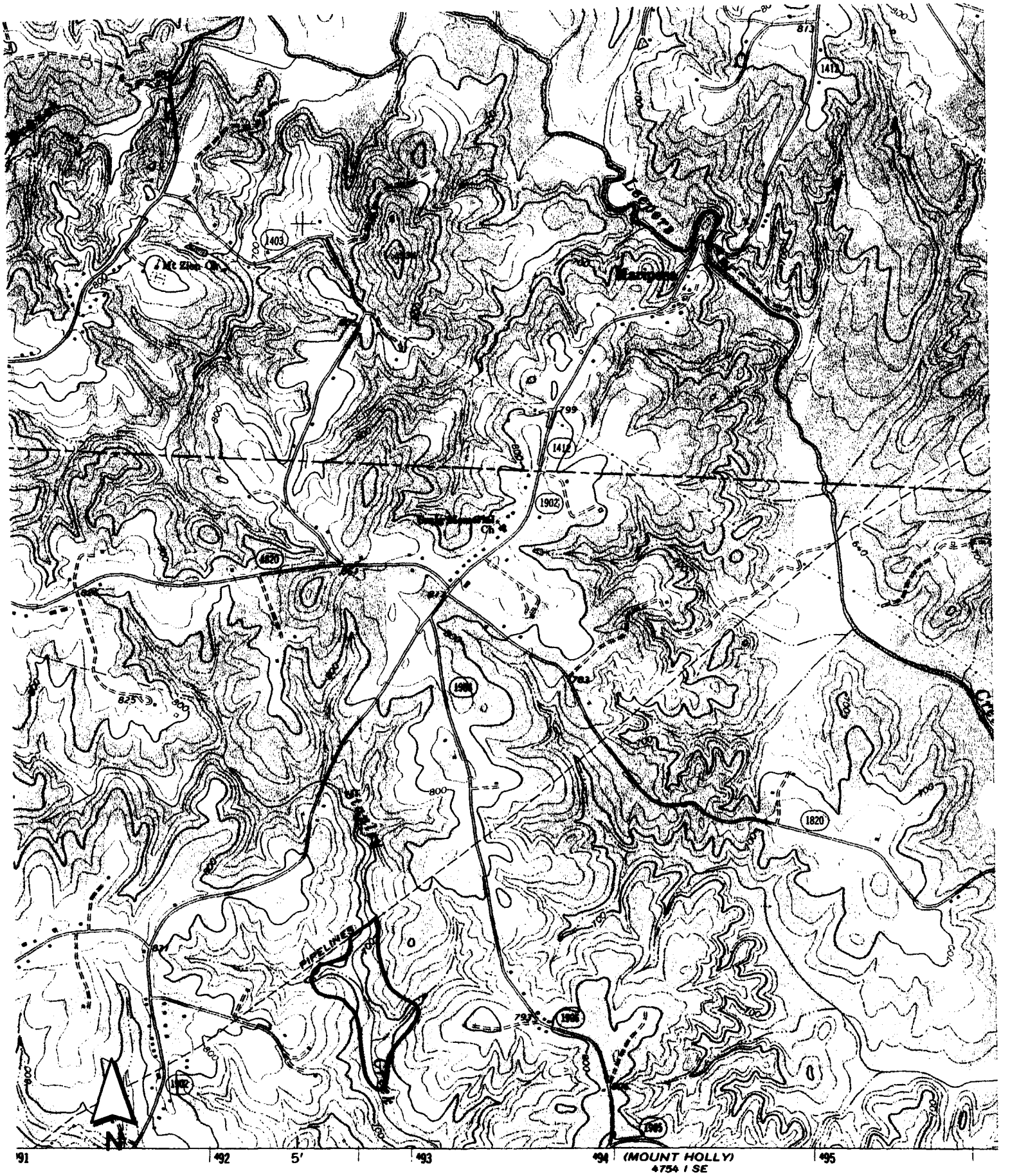
SITE NUMBER: B05 **NAME OF SITE:** Stanley Creek

SUBCANOPY: Magnolia macrophylla (20.1" and 18.6" DBH), Carpinus caroliniana, Oxydendrum arboreum, Cornus florida, Acer rubrum, Nyssa sylvatica.
SHRUBS: Kalmia latifolia, Ilex opaca, Asimina triloba Rhododendron nudiflorum, Lindera benzoin, Hamamelis virginiana, Alnus serrulata, Vaccinium vacillans, Viburnum prunifolium, Castanea dentata, Chionanthus virginicus Xanthorhiza simplicissima, Leucothoe axillaris var. editorum.
VINES: Smilax spp., Parthenocissus quinquefolia, Dioscorea villosa.
HERBS: Galax aphylla, Pedicularis canadensis, Cacalia atriplicifolia, Hexastylis minor, Sanicula spp., Chimaphila maculata, Hieracium venosum, Rudbeckia hirta, Silene virginica, Monotropa uniflora, Ranunculus spp., Aristolochia serpentaria, Sanguinaria canadensis, Polygonatum biflorum, Elephantopus spp., Chamaelirium luteum, Hepatica americana, Scutellaria elliptica, Smilacina racemosa, Amianthium muscaetoxicum, Cimicifuga racemosa, Heuchera spp., Uvularia perfoliata, Galium spp., Trillium catesbaei, Trautvetteria carolinensis.
FERNS: Botrychium virginianum, Polystichum acrostichoides, Asplenium platyneuron, Thelypteris noveboracensis, Woodwardia areolata, Lycopodium flabelliforme.

ANIMAL SPECIES LIST:

DATE: 17-Jun-96 **UPDATES:**

OWNER NAME: Private



Gaston County Natural Heritage Inventory

December 1999

B05: Stanley Creek

Lowesville Quadrangle

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B06 **NAME OF SITE:** Spencer Mtn. Dam

Size: 20 acres **Quadrangle:** Mt. Holly
Province: PIEDMONT **Watershed:** South Fork Catawba

Site Significance:
COUNTY (May become an "A" site.)

Special Status Species (attach EORs):

Potential for other Special Status Species:

Other noteworthy species or features present:

PHYSICAL DESCRIPTION

Locations and Directions:

Above Spencer Mtn. Dam, East of South Fork River. Accessible from SR 2003.

Landscape Description: Dry ridge with canopy dominated by chestnut oaks. Some scarlet and white oak. Slope contained M. macrophylla and Kalmia. Good integrity. Undisturbed for some time.

Aspect: NW **Slope:** 50 degrees **Elevation (ft above MSL):** 600-740

Topographic Position: Slope and Crest

Hydrology: Mostly Dry **Moisture:** Xeric, Dry Mesic, Mesic

Geology: Zbs, ZbKg

Soils: Congaree loam, Uwharrie stony loam, Tatum gravelly loam

Comments on Physical Description:

Very steep slope.

BIOLOGICAL DESCRIPTION

A. Chestnut-Oak Forest, Dry-Mesic Oak-Hickory Forest. The Quercus prinus on the ridge merges into the more mesic forest below, which has some characteristics of a Mesic Mixed Hardwood Forest.
B. The site is a dry ridge that drops steeply toward the river. The population of Magnolia macrophylla is well-developed on the lower slope and extends to the drier area.
C. Canopy - Quercus prinus fading into Q. alba and Q. coccinea.
Subcanopy - mostly Magnolia macrophylla, Oxydendrum arboreum, Ilex opaca and Acer rubrum. Shrubs include Rhododendron nudiflorum, Kalmia latifolia, Hamamelis virginiana and Chionanthus virginicus. The herbaceous layer is fairly diverse, including Smilax ecirrhata, Polygonatum biflorum, Thalictrum thalictroides, Cimicifuga racemosa, Sanguinaria canadensis, Trillium catesbaei and Lilium michauxii.
D. This relatively undisturbed site is unusual in having Magnolia macrophylla up a fairly dry NW facing slope, with a good mesic community at the base and along the river.
E. A well-preserved community protected by the river and the steepness of the slope.
F. 20 acres.

Site Integrity: Good **Fire regime:**

Maximum DBH of canopy trees: 28" **Average DBH of canopy trees:** 18"

Logged (y/n): No **Stream channelized (y/n):** No

Even-aged canopy (y/n): No **Dredging/filling (y/n):** No

Non-native / weedy species present (y/n): No **Understory cleared (y/n):** No

Ditched/drained (y/n): No **Grazing (y/n):** No

Comments on Biological Description:

Needs to be revisited to better define the communities.

ADJACENT LAND USE:

PROTECTION / MANAGEMENT NEEDS:

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B06 **NAME OF SITE:** Spencer Mtn. Dam

DOCUMENTATION:

Should this site be investigated further? Yes.

PLANT SPECIES LIST:

CANOPY: Quercus prinus, Q. alba, Fagus grandifolia, Pinus virginiana, P. echinata, Q. coccinea, Liriodendron tulipifera, Liquidambar styraciflua SUBCANOPY: Oxydendrum arboreum, Ilex opaca, Acer rubrum, Magnolia macrophylla, Diospyros virginiana, Juniperus virginiana, Carpinus caroliniana, Betula nigra, Fraxinus pennsylvanica.

SHRUBS: Rhododendron nudiflorum, Vaccinium spp., Kalmia latifolia, Castanea dentata, Amelanchier spp., Chionanthus virginicus, Asimina triloba, Hamamelis virginiana, Calycanthus floridus, Corylus americana, Styrax grandifolia, Viburnum acerifolium, Euonymus americanus, Aesculus sylvatica, Viburnum dentatum.

VINES: Vitis rotundifolia, Anisostichus capreolata.

HERBS: Smilax ecirrhata, Monotropa hypopithys, Chimaphila maculata, Goodyera pubescens, Mitchella repens, Hexastylis arifolia, Polygonatum biflorum, Thalictrum thalictroides, Cimicifuga racemosa, Sanguinaria canadensis, Geranium maculatum, Galax aphylla, Hexastylis minor, Desmodium spp., Trillium catesbaei, Lilium michauxii, Uvularia perfoliata, Podophyllum peltatum, Peltandra virginica.

FERNS: Pteridium aquilinum, Polystichum acrostichoides, Asplenium platyneuron, Athyrium asplenioides, Botrychium virginianum, Lycopodium lucidulum

ANIMAL SPECIES LIST:

DATE: 27-Jun-96 **UPDATES:**

OWNER NAME: Private

Gaston County Natural Heritage Inventory

December 1999

B06: Spencer Mtn. Dam

Mt. Holly Quadrangle

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B07 **NAME OF SITE:** South Pasour Mtn. - Piedmont Monadnock Forest

Size: 70 acres **Quadrangle:** Bessemer City
Province: PIEDMONT **Watershed:** Long Creek

Site Significance:
COUNTY (Piedmont Monadnock Forest.)

Special Status Species (attach EORs):

Potential for other Special Status Species:

Other noteworthy species or features present:

PHYSICAL DESCRIPTION

Locations and Directions:

At the end of Mountain Meadows Rd.

Landscape Description: Piedmont Monadnock Forest with development at the NW and SE. Radio tower on top.

Aspect: NW, SE **Slope:** Flat to 35 degrees **Elevation (ft above MSL):** 1160

Topographic Position: Crest and Upper Slope

Hydrology: Terrestrial **Moisture:** Xeric

Geology: Zbls & Zblq

Soils: TaB, TaD - Tatum gravelly loam; UwF-Uwharrie strong loam

Comments on Physical Description:

BIOLOGICAL DESCRIPTION

A. Piedmont Monadnock Forest.
B. Top of ridge is 95% Quercus prinus.
C. Quercus prinus in the canopy with some Q. coccinea, Q. marilandica, Q. alba, Q. stellata and Q. velutina. The subcanopy is mostly Oxydendrum arboreum, Acer rubrum and Nyssa sylvatica. The herbaceous layer is sparse.
D. One of the better preserved Piedmont Monadnock Forests in the county. Development, agriculture, industrial activity and communication towers occur on or around the site.
E. Good quality due to City of Gastonia ownership.
F. 70 acres.

Site Integrity: Fair to good **Fire regime:**

Maximum DBH of canopy trees: 13" **Average DBH of canopy trees:** 9"

Logged (y/n): No **Stream channelized (y/n):** No

Even-aged canopy (y/n): No **Dredging/filling (y/n):** No

Non-native / weedy species present (y/n): No **Understory cleared (y/n):** No

Ditched/drained (y/n): No **Grazing (y/n):** No

Comments on Biological Description:

West ravine has moer Acer rubrum, Smilaz and a general absence of Carya spp.

ADJACENT LAND USE:

PROTECTION / MANAGEMENT NEEDS:

DOCUMENTATION:
UNCC

PLANT SPECIES LIST:
CANOPY: Quercus prinus, Q. coccinea, Pinus echinata, Q. velutina, Q. marilandica, Q. alba, Q. stellata.
SUBCANOPY: Acer rubrum, Liquidambar styraciflua, Oxydendrum arboreum, Quercus marilandica, Nyssa

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B07 **NAME OF SITE:** South Pasour Mtn. - Piedmont Monadnock Forest

sylvatica, Juniperus virginiana.
SHRUBS: Vaccinium stamineum, Acer rubrum, Symplocos tinctoria, Sassafras albidum, Quercus phellos, Prunus serotina, Rhus glabra, R. copallina, Comptonia peregrina, Ilex opaca, Vaccinium vacillans.
VINES: Vitis rotundifolia, Smilax spp., Parthenocissus quinquefolia, Vitis aestivalis, Toxicodendron radicans.
HERBS: Smilax echirrata, Coreopsis major, Hieracium venosum, Epigaea repens, Chimaphila maculata, Solidago odorata, Tephrosia virginiana, Aster solidagineus, Baptisia tinctoria.
FERNS: Pteridium aquilinum.

ANIMAL SPECIES LIST:

DATE: 02-Jul-96 **UPDATES:** 05-June-97

OWNER NAME: City of Gastonia (in part)

Gaston County Natural Heritage Inventory

December 1999

B07: South Pasour Mtn. - Piedmont Monadnock Forest

Bessemer City Quadrangle

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B08 **NAME OF SITE:** Middle Pasour Mtn.

Size: 140 acres **Quadrangle:** Gastonia North
Province: PIEDMONT **Watershed:** Long Creek

Site Significance:
COUNTY (Site was selected using aspect, slope, position relative to drainage systems and forest cover indicated on USGS topographic maps. The subsequent site survey revealed little significance.)

Special Status Species (attach EORs):

Potential for other Special Status Species:

Other noteworthy species or features present: Quercus ilicifolia

PHYSICAL DESCRIPTION

Locations and Directions:

NW of Junction of NC 279 and SR 1448.

Landscape Description: A monadnock projecting above the landscape surrounded by agriculture and development.

Aspect: N, S, E, W, especially E & W **Slope:** Flat to 45 degrees **Elevation (ft above MSL):** 1210

Topographic Position: Crest, Upper/Mid/Lower Slopes

Hydrology: Terrestrial **Moisture:** Dry (Xeric)

Geology: Zbls

Soils: UwF, TaD

Comments on Physical Description:

BIOLOGICAL DESCRIPTION

A. Piedmont Monadnock Forest.
B. This is a typical monadnock forest dominated by Quercus prinus. It is more disturbed than Pasour Mtn. South, and as a result has more weedy species. There is a road that passes up the spine from South to North. In general, the area has been disturbed to a significant degree. The less steep western slope is abandoned pasture and has been timbered. The steeper east slope is less disturbed. It was not surveyed during the first visit, and could not be surveyed since a second visit was not permitted. There is a power line ROW across the northern tip, with disturbance on both sides of the ROW. There are less oaks (Q. alba, Q. coccinea and Q. marilandica) and more pines (Pinus virginiana and P. echinata) than in a less disturbed habitat. A documented report of Q. ilicifolia from the 1993 visit was not reconfirmed in the 1996 visit.
C. Canopy: Quercus prinus, with Pinus virginiana, P. echinata, Q. coccinea and Q. marilandica and some Liriodendron tulipifera in the more mesic lower slopes. The subcanopy is dominated by Oxydendrum arboreum, Acer rubrum, Carya glabra, Nyssa sylvatica, Prunus serotina, with Q. phellos occurring on the lower slopes. The shrubs include Kalmia latifolia, Vaccinium stamineum, Rhus copallina, Gaylussacia baccata, Sassafras albidum, Hamamelis virginiana and Vaccinium vacillans. Herbs include Tephrosia virginiana, Coreopsis major, Hypericum stragalum, Chimaphila maculata, Lechea tenuifolia, Baptisia tinctoria, Epigaea repens, Iris cristata and Hypoxis hirsuta.
D. Piedmont monadnocks are not common. None of the Gaston County monadnocks are cited in Schafale and Weakley (1990). They differ significantly from the Dry Oak-Hickory and Dry-Mesic Oak-Hickory Forests that surrounded them, although these latter suffer from disturbance.
E. This monadnock is of lesser quality than South Pasour Mtn. However, it would be good to preserve it if possible. The ownership is tied up within a family. There is some development from some of the family. They now have restricted visitations.
F. 140 ac.

Site Integrity: Fair **Fire regime:**

Maximum DBH of canopy trees: 21" **Average DBH of canopy trees:** 12"

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B08 **NAME OF SITE:** Middle Pasour Mtn.

Logged (y/n): Yes
Stream channelized (y/n): No
Even-aged canopy (y/n): No
Dredging/filling (y/n): No
Non-native / weedy species present (y/n): Yes
Understory cleared (y/n): Yes
Ditched/drained (y/n): No
Grazing (y/n): Yes

Comments on Biological Description:

ADJACENT LAND USE: Agriculture, Development

PROTECTION / MANAGEMENT NEEDS:

DOCUMENTATION:
UNCC

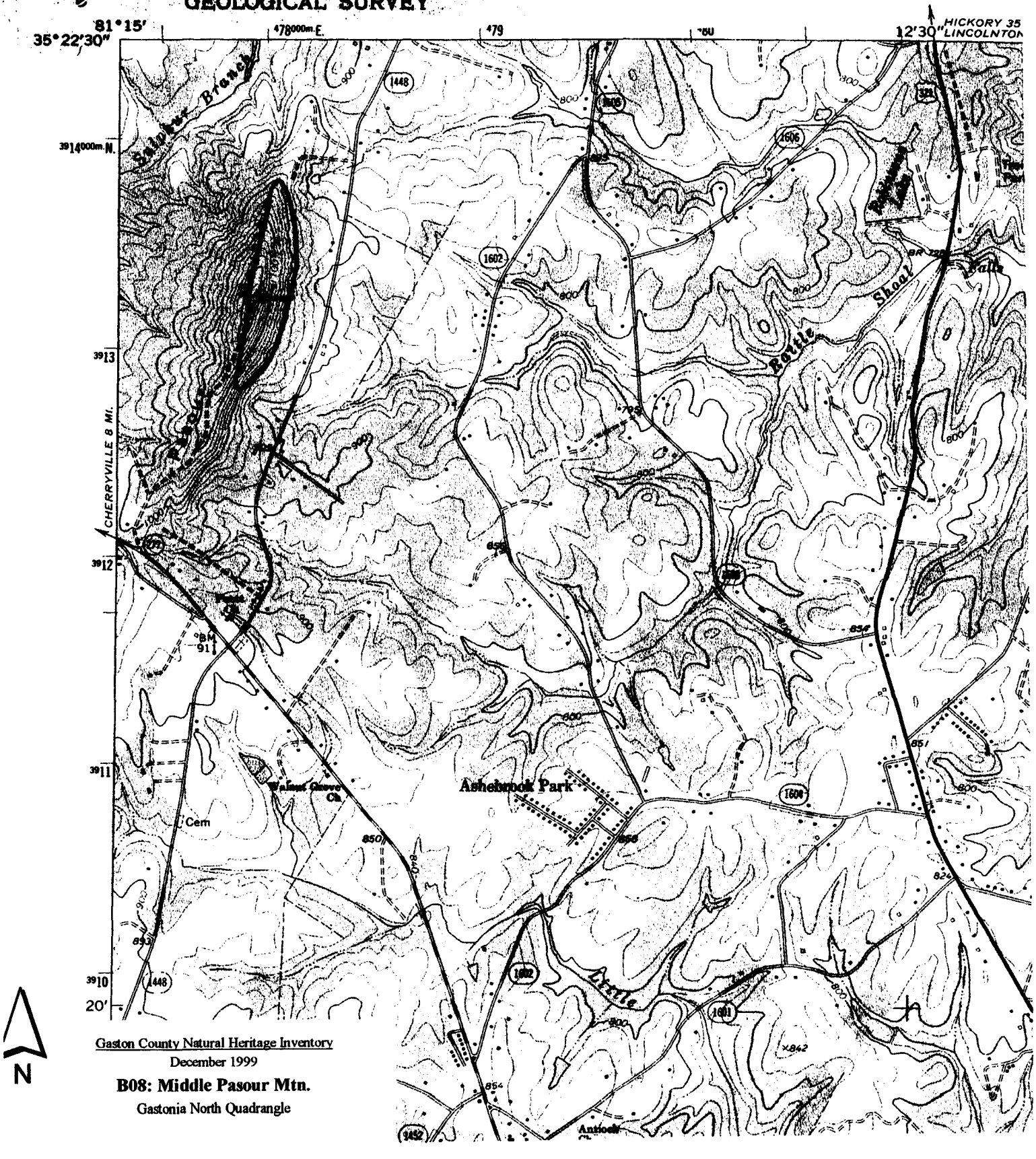
PLANT SPECIES LIST:
CANOPY: Quercus prinus, Pinus virginiana, P. echinata, Quercus coccinea, Q. marilandica, Q. alba, Paulownia tomentosa, Carya tomentosa, C. glabra, Liriodendron tulipifera. SUBCANOPY: Oxydendrum arboreum, Acer rubrum, Nyssa sylvatica, Prunus serotina, Carya glabra, Q. phellos, Diospyros virginiana, Cornus florida. SHRUBS: Vaccinium stamineum, V. vacillans, Kalmia latifolia, Rhus copallina, Rhododendron nudiflorum, Gaylussacia baccata, Hamamelis virginiana, Sassafras albidum, and Castanea pumila. HERBS: Tephrosia virginiana, Coreopsis major, Hypericum stragalum, Lechea tenuifolia, Hieracium venosum, H. pratense, Baptisia tinctoria, Iris cristata, Epigaea repens, Hypoxis hirsuta, Eupatorium capillifolium, Sorghastrum nutans, Danthonia spicata, Smilax ecirrhata var. biltmoreana, Taenidia integerrima, Lilium michauxii, Euphorbia corollata var. zinniiflora, Silphium compositum, Galax aphylla, Chimaphila maculata, Sisyrinchium angustifolium, Viola pedata, Linaria canadensis.
VINES: Toxicodendron radicans, Lonicera japonica, Smilax hispida.
FERNS: Pteridium aquilinum.

ANIMAL SPECIES LIST:

DATE: 04-Jul-96 **UPDATES:** 30-April-93 (From a species list)

OWNER NAME: Private

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



Gaston County Natural Heritage Inventory

December 1999

B08: Middle Pasour Mtn.

Gastonia North Quadrangle

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B09 **NAME OF SITE:** Long Creek Gaging Station

Size: 17 acres **Quadrangle:** Gastonia North
Province: PIEDMONT **Watershed:** Long Creek

Site Significance:
COUNTY (Good quality wetland.)

Special Status Species (attach EORs):
Potential for other Special Status Species:
Other noteworthy species or features present: Isoetes valida, Lycopodium obscurum

PHYSICAL DESCRIPTION
South side of creek.

Locations and Directions:
Northern Gaston County - Dallas area. From Gastonia, travel W on 279, then North on White Jenkins Rd, SR1456. Continue approximately 1 1/4 mile. Site is West of White Jenkins Rd on Long Creek.

Landscape Description:
Aspect: N **Slope:** < 2% **Elevation (ft above MSL):** 700-760
Topographic Position: Alluvial Flat
Hydrology: Palustrine **Moisture:** Frequently Flooded
Geology: Zbs - Battleground Formation. Quartz-sericite schist
Soils: CH

Comments on Physical Description:
The area between the two ridges is primarily a wetland. Integrity here was good; containing Isoetes valida.

BIOLOGICAL DESCRIPTION
A. Piedmont/Low Mountain Alluvial Forest.
B. The canopy trees, though sparse, include bottomland type trees. Platanus occidentalis, Acer negundo, Salix nigra, Betula nigra, Fraxinus pennsylvanica, Populus deltoides and Acer rubrum. The Subcanopy includes Carpinus caroliniana, Liriodendron tulipifera and Liquidambar styraciflua. Shrubs include Xanthorhiza simplicissima, Arundinaria gigantea, Vaccinium spp., Cornus amomum, Celtis spp., Ligustrum spp., Cornus florida, Corylus americana, Rhamnus caroliniana, Euonymus americana, Asimina triloba, Viburnum dentatum, Viburnum nudum, Kalmia latifolia and Prunus angustifolia. Vines are prominent, including Toxicodendron radicans, Lonicera sempervirens, Anisostichus capreolata, Lonicera japonica, Parthenocissus quinquefolia, Rosa spp. and Vitis rotundifolia. The herb layer is fairly lush and diverse. Species include Asclepias spp., Polygonatum biflorum, Pedicularis canadensis, Podophyllum peltatum, Peltandra virginica, Sagittaria spp., Carex spp., Isoetes valida, Arisaema triphyllum, Clematis virginiana, Dioscorea spp. and Tradescantia ohiensis. Ferns present are Botrychium virginianum, Woodwardia areolata, Onoclea sensibilis and Polystichum acrostichoides.
C. This site is positioned right off White Jenkins Rd (SR 1456) with Long Creek running E-W, North of the site.
D. The wetland area is the main area of interest.
F. ca.17 acres.

Site Integrity: Good **Fire regime:** No evidence.
Maximum DBH of canopy trees: 18" **Average DBH of canopy trees:** 12"
Logged (y/n): Yes **Stream channelized (y/n):** No
Even-aged canopy (y/n): No **Dredging/filling (y/n):** No
Non-native / weedy species present (y/n): Yes **Understory cleared (y/n):** No
Ditched/drained (y/n): No **Grazing (y/n):** No

Comments on Biological Description:
Non-native: Lonicera japonica, Polygonum spp.

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B09 **NAME OF SITE:** Long Creek Gaging Station

ADJACENT LAND USE: Residential Housing

PROTECTION / MANAGEMENT NEEDS:

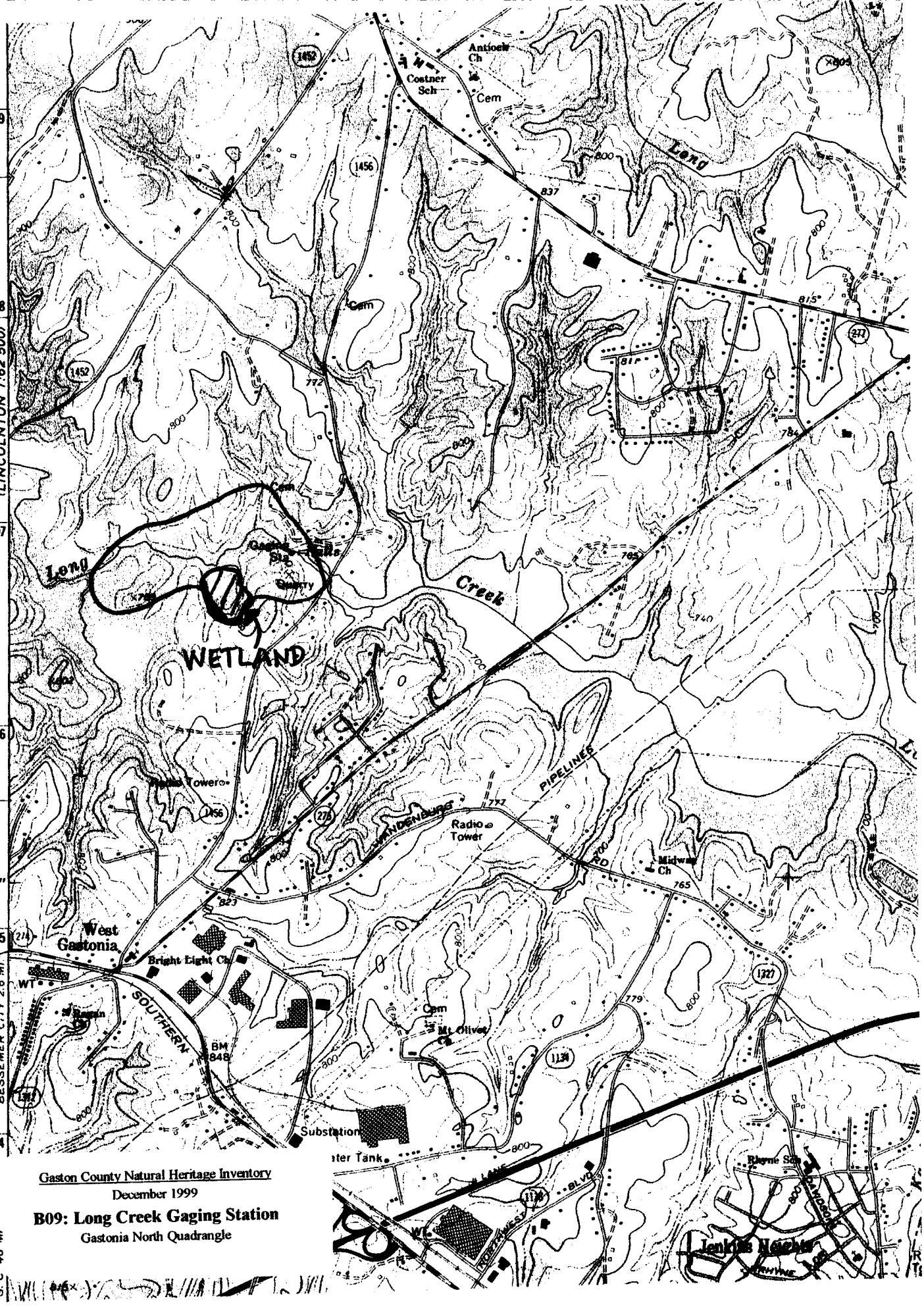
DOCUMENTATION:
UNCC

PLANT SPECIES LIST:
CANOPY: Platanus occidentalis, Acer negundo, A. rubrum, Salix nigra, Fraxinus pennsylvanica, Betula nigra, Quercus nigra, Populus deltoides, Juniperus virginiana.
SUBCANOPY: Liriodendron tulipifera, Ulmus alata, Carpinus caroliniana, Carya spp., Prunus serotina, Liquidambar styraciflua.
SHRUBS: Alnus serrulata, Cornus amomum, Ligustrum sinense, Celtis spp., Prunus angustifolia, Leucothoe axillaris, Viburnum nudum, V. dentatum, Corylus americana, Asimina triloba, Vaccinium spp., Arundinaria gigantea, Xanthorhiza simplicissima.
VINES: Parthenocissus quinquefolia, Lonicera japonica, Toxicodendron radicans, Rosa spp., Vitis rotundifolia, Anisostichus capreolata, Lonicera sempervirens.
HERBS: Asclepias spp., Uniola latifolia, Smilax spp., Pedicularis canadensis, Hepatica americana, Podophyllum peltatum, Peltandra virginica, Sagittaria spp., Heuchera americana, Arisaema triphyllum, Clematis virginiana, Typha latifolia, Arisaema dracontium, Tradescantia ohiensis, Dioscorea spp., Carex spp.
WEEDY SPECIES: Lonicera japonica.
FERNS: Botrychium virginianum, Woodwardia areolata, Onoclea sensibilis, Polystichum acrostichoides, Lycopodium obscurum, Athyrium asplenioides, Lycopodium flabelliforme, Isoetes valida

ANIMAL SPECIES LIST:

DATE: 30-Apr-97 **UPDATES:**

OWNER NAME: Private



Gaston County Natural Heritage Inventory

December 1999

B09: Long Creek Gaging Station

Gastonia North Quadrangle

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B10 **NAME OF SITE:** Mauney Creek

Size: 10 acres **Quadrangle:** Gastonia North
Province: PIEDMONT **Watershed:** Hoyle Creek

Site Significance:
COUNTY

Special Status Species (attach EORs): Magnolia macrophylla
Potential for other Special Status Species:
Other noteworthy species or features present:

PHYSICAL DESCRIPTION

Locations and Directions:

From Dallas, take 275 E (Dallas-Stanley Hwy) to SR 1827 (Left). Travel ca. 1.0 mile. Slope is on the Left. Access from the roadside.

Landscape Description:

Aspect: N, W, NW **Slope:** 5-10-35 **Elevation (ft above MSL):** 680-800

Topographic Position: Upper and Mid Slopes

Hydrology: Terrestrial **Moisture:** Mesic, Dry Mesic

Geology: Mostly foliated granite rock (Pennsylvanian to Permian 270-230 my). High Shoals Granite (megacrystic to equigranular)

Soils: MaE-Madison sandy loam, 15-25% slopes; MaDZ-Madison sandy clay loam, 8-15% slopes, eroded; PaE-Pa sandy loam, 15-25% slopes

Comments on Physical Description:

Steep, somewhat rocky, slopes dominated by Kalmia latifolia and Magnolia macrophylla.

BIOLOGICAL DESCRIPTION

A. Mesic Mixed Hardwood Forest. The canopy is dominated by Quercus rubra, Quercus alba, Liriodendron tulipifera and Fagus grandifolia. The understory includes Carpinus caroliniana, Oxydendrum arboreum, Nyssa sylvatica, Fagus grandifolia, Carya spp., Cornus florida, Corylus cornuta, Kalmia latifolia, Styrax spp., Magnolia macrophylla and Vaccinium spp. Dominant vines include Parthenocissus quinquefolia and Vitis rotundifolia. The herb layer is fairly diverse and dense in areas. Herbs include Hexastylis minor, Aruncus dioicus, Uvularia perfoliata and U. pudica, Sanguinaria canadensis, Trillium catesbaei, Scutellaria elliptica, Chamaelirium luteum, Medeola virginiana, Lobelia cardinalis, Tiarella cordifolia and Hepatica americana. The toe of the slope along Mauney Creek provides for the success of many ferns including Osmunda cinnamomea, Thelypteris noveboracensis, Adiantum pedatum, Polystichum acrostichoides, Woodwardia areolata and Pteridium aquilinum. This site supports many Magnolia macrophylla specimens. Kalmia latifolia is also in abundance. This steep slope is positioned just off SR 1827, with Mauney Creek running along the NW-N facing slope. Possibly grades into Piedmont/Low Mtn. Alluvial Forest or Bottomland Forest below. The site quality is fair. The presence of Magnolia macrophylla make this area worthwhile. However, should Magnolia macrophylla cease to exist here, the site quality would undoubtedly fall to POOR. ca. 4500 feet from Mauney Creek to end of survey boundary. Approx. 10 acres.

Site Integrity: Fair **Fire regime:**

Maximum DBH of canopy trees: 24" **Average DBH of canopy trees:** 15"

Logged (y/n): No **Stream channelized (y/n):** No

Even-aged canopy (y/n): No **Dredging/filling (y/n):** No

Non-native / weedy species present (y/n): No **Understory cleared (y/n):** No

Ditched/drained (y/n): No **Grazing (y/n):** No

Comments on Biological Description:

ADJACENT LAND USE: Residential

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B10 **NAME OF SITE:** Mauney Creek

PROTECTION / MANAGEMENT NEEDS:

DOCUMENTATION:

We followed along Mauney Creek, up the slope and back around until we felt the site integrity was decreasing.

PLANT SPECIES LIST:

CANOPY: Magnolia macrophylla, Quercus rubra, Q. alba, Q. nigra, Liriodendron tulipifera, Fagus grandifolia.
SUBCANOPY: Acer rubrum, Carya spp., Fagus grandifolia, Prunus serotina, Ilex opaca, Carpinus carolina, Q. prinus, Asimina triloba, Oxydendrum arboreum, Castanea dentata, Halesia caroliniana, Nyssa sylvatica, Cornus florida, Rhamnus caroliniana SHRUBS: Kalmia latifolia, Corylus cornuta, Hamamelis virginiana, Corylus americana, Calycanthus floridus, Aesculus sylvatica, Rhododendron nudiflorum, Ilex decidua, Vaccinium stamineum, Styrax grandifolia, Chionanthus virginicus, Sassafras albidum, Arundinaria gigantea, Euonymus americanus, Xanthorhiza simplicissima.
VINES: Vitis rotundifolia, Parthenocissus quinquefolia.
HERBS: Hexastylis minor, Aruncus dioicus, Uvularia perfoliata, U. pudica, Sanguinaria canadensis, Trillium catesbaei, Thalictrum thalictroides, Ligusticum canadensis, Cimicifuga racemosa, Aureolaria virginica, Epigea repens, Scutellaria elliptica, Iris cristata, Sisyrinchium spp., Chamaelirium luteum, Microstegium vimineum, Medeola virginiana, Phytolacca americana, Mitchella repens, Lobelia cardinalis, Smilacina racemosa, Viola spp., Geranium maculatum, Chimaphila maculata, Podophyllum peltatum, Tiarella cordifolia, Hepatica americana.
FERNS: Polystichum acrostichoides, Thelypteris noveboracensis, Osmunda cinnamomea, Botrychium virginianum, Adiantum pedatum, Lycopodium flabelliforme, Asplenium platyneuron, Woodwardia areolata, Pteridium aquilinum.

ANIMAL SPECIES LIST:

DATE: 07-May-97 **UPDATES:**

OWNER NAME: Private

Gaston County Natural Heritage Inventory

December 1999

B10: Mauney Creek

Gastonia North Quadrangle

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B11 **NAME OF SITE:** Mike Moore Hill

Size: 90 acres **Quadrangle:** Gastonia North
Province: PIEDMONT **Watershed:** Hoyle Creek

Site Significance:
COUNTY

Special Status Species (attach EORs): Magnolia macrophylla
Potential for other Special Status Species:
Other noteworthy species or features present:

PHYSICAL DESCRIPTION

Locations and Directions:

From Dallas take 275 E (Dallas-Stanley Hwy) to SR 1827. Continue North to Moore Rd (gravel road on Left). Continue ca. 0.4 miles to a gate (Left). Enter here. Drive across field to tree line where road cut-out continues through woods.

Landscape Description:

Aspect: N, W, NW **Slope:** 0-5-10-35 **Elevation (ft above MSL):** 700-800

Topographic Position: Upper and Mid Slopes

Hydrology: Terrestrial, Palustrine **Moisture:** Seasonally Wet, Dry Mesic

Geology: PPmg-Mostly foliated granite rock (Pennsylvania to Permian 270-230 my) High Shoals Granite (megacrystic to equigranular)

Soils: Co-Congaree loam, occassionally flooded; PaF-Pacolet sandy loam, 25-45% slopes; PaE-Pacolet sandy loa 25% slopes; PaDZ-Pacolet sandy clay loam, 8-15% slopes, eroded

Comments on Physical Description:

Very dry and rocky upper and mid slopes, predominantly Quercus prinus and Kalmia latifolia. Magnolia macrophylla was scarce & scattered.

BIOLOGICAL DESCRIPTION

A. Chestnut Oak Forest.
B. The canopy is dominated by Quercus prinus. Other Quercus species are present, but only in small numbers. The subcanopy includes some Magnolia macrophylla (scarce & scattered), Oxydendrum arboreum, Acer rubrum, Corylus cornuta and C. americana, Castanea dentata and Sassafras albidum. The shrub layer is predominantly Kalmia latifolia, with the occasional occurrence of Rhododendron nudiflorum, Vaccinium stamineum, Castanea pumila and Halesia carolina. Vines include Vitis rotundifolia, Parthenocissus quinquefolia, Toxicodendron radicans, Lonicera sempervirens and Anisostichus capreolata. Herbs range from moderately sparse to sparse, including Aureolaria laevigata, Trillium catesbaei, Smilacina racemosa, Aristolochia serpentaria, Silene spp., Aruncus dioicus, Scutellaria elliptica, Polygonatum biflorum, Goodyera pubescens, Arisaema triphyllum, Stellaria pubera and Uvularia perfoliata. At the toe of the slope along Little Hoyle Creek, the area is moist and supports a variety of ferns such as Asplenium platyneuron, Botrychium virginianum, Athyrium asplenioides, Adiantum pedatum, Thelypteris hexagonoptera, Thelypteris noveboracensis and Polystichum acrostichoides.
C. Quercus prinus is canopy dominant, Oxydendrum arboreum is subcanopy dominant, Kalmia latifolia is shrub dominant, Castanea dentata & pumila also in abundance.
D. Very dry and rocky mid and upper slope, ranging in elevation from 700-800 feet. Possibly grades down to Mesic Mixed Hardwood Forest.
E. The overall quality of the site is fair to good, although the combination of dominant Quercus prinus, Kalmia latifolia and a few Magnolia macrophylla make this site unique.
F. Approx. 90 acres.

Site Integrity: Fair to Good **Fire regime:**

Maximum DBH of canopy trees: 26" **Average DBH of canopy trees:** 22"

Logged (y/n): No **Stream channelized (y/n):** No

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B11 **NAME OF SITE:** Mike Moore Hill

Even-aged canopy (y/n): No **Dredging/filling (y/n):** No

Non-native / weedy species present (y/n): No **Understory cleared (y/n):** No

Ditched/drained (y/n): No **Grazing (y/n):** No

Comments on Biological Description:

Animal (deer) trails throughout with one main man-made road passage up the slope.

ADJACENT LAND USE: Agriculture, Residential

PROTECTION / MANAGEMENT NEEDS:

DOCUMENTATION:
UNCC

PLANT SPECIES LIST:
CANOPY: Quercus prinus, Q. stellata, Q. rubra, Q. alba, Pinus strobus, Pinus echinata, Nyssa sylvatica, Liquidambar styraciflua, Liriodendron tulipifera.
SUBCANOPY: Cornus florida, Chionanthus virginicus, Q. prinus, Magnolia macrophylla, Carya glabra, Carpinus caroliniana, Acer rubrum, Castanea dentata, Q. rubra, Oxydendrum arboreum, Aesculus sylvatica, Cercis canadensis.
SHRUBS: Vaccinium stamineum, Sambucus canadensis, Corylus americana, Ilex opaca, Kalmia latifolia, Sassafras albidum, Rhododendron nudiflorum, Castanea pumila, Calycanthus floridus, Halesia carolina, Tilia americana, Euonymus americanus, Hamamelis virginiana.
VINES: Vitis rotundifolia, Parthenocissus quinquefolia, Smilax spp., Toxicodendron radicans, Lonicera sempervirens, Anisostichus capreolata.
HERBS: Aureolaria spp., Trillium catesbaei, Chimaphila maculata, Smilacina racemosa, Houstonia spp., Hexastylis minor, Antennaria solitaria, Iris cristata, Galium spp., Aristolochia serpentaria, Sanguinaria canadensis, Amianthium muscaetoxicum, Silene virginica, Cimicifuga racemosa, Chrysogonum virginianum, Aruncus dioicus, Scutellaria elliptica, Hepatica americana, Polygonatum biflorum, Goodyera pubescens, Mitchella repens, Arisaema triphyllum, Collinsonia canadensis, Stellaria pubera, Dioscorea villosa, Thaspium barbinode, Tipularia discolor, Uvularia perfoliata, Viola spp., Chamaelirium luteum, Coreopsis auriculata, Geranium maculatum, Physalis spp., Matalea spp., Monotropa uniflora, Epigaea repens, Salvia urticifolia, Potentilla recta.
FERNS: Polystichum acrostichoides, Thelypteris noveboracensis, Thelypteris hexagonoptera, Adiantum pedatum, Athyrium asplenioides, Botrychium virginianum, Asplenium platyneuron, Lycopodium flabelliforme.

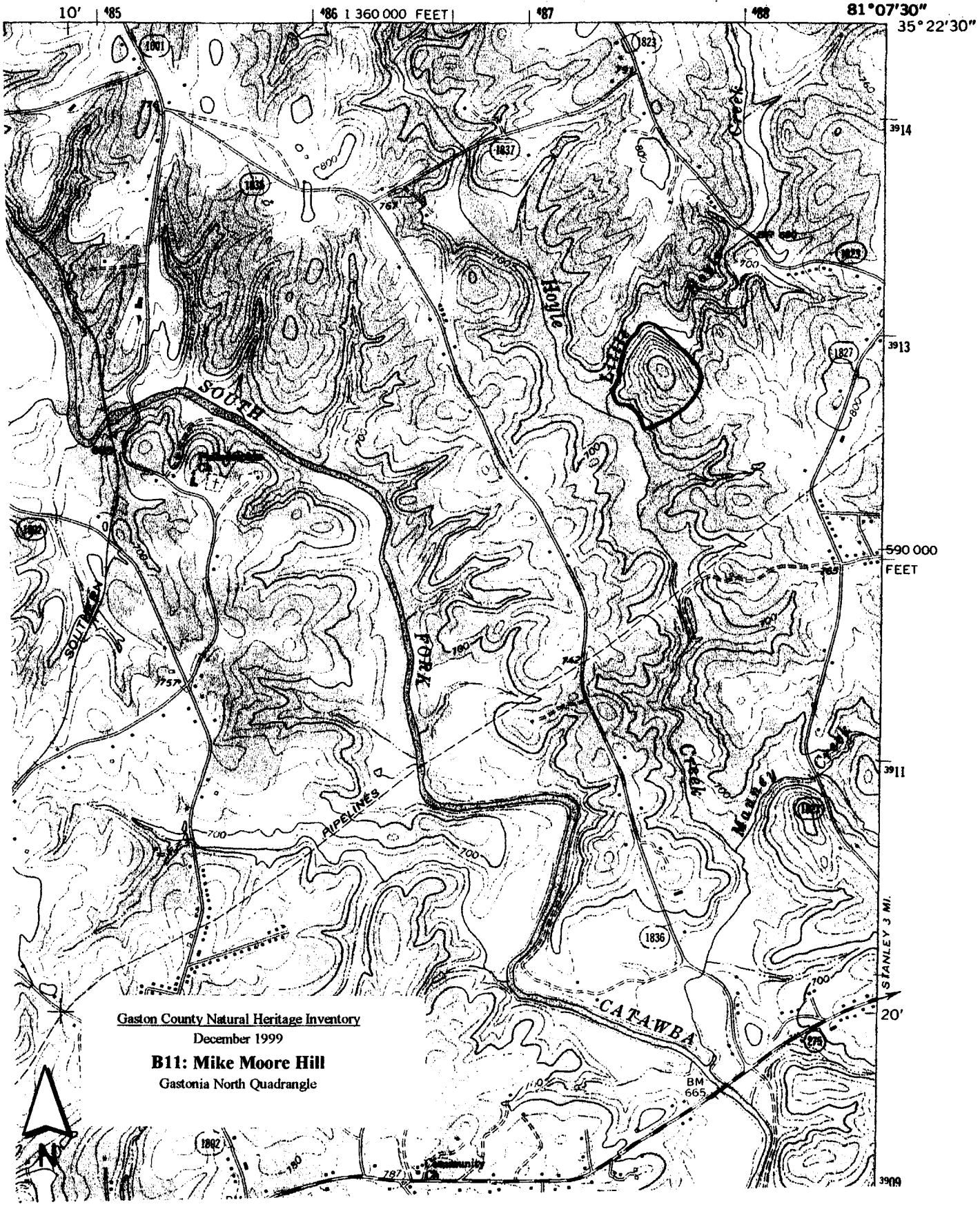
ANIMAL SPECIES LIST:

DATE: 08-May-97 **UPDATES:**

OWNER NAME: Private

GASTONIA NORTH QUADRANGLE
NORTH CAROLINA—GASTON CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
SW/4 GASTONIA 15' QUADRANGLE

4704 I NE (LOWESVILLE)



SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B12 **NAME OF SITE:** Penegar, Gastonia South

Size: 32 acres **Quadrangle:** Gastonia South
Province: PIEDMONT **Watershed:** Crowders Creek

Site Significance:
COUNTY (Diversity of species.)

Special Status Species (attach EORs):

Potential for other Special Status Species:

Other noteworthy species or features present: Trillium cernuum, Lilium michauxii, Asarum canadense

PHYSICAL DESCRIPTION

N, NE facing slopes adjacent to Crowders Creek.

Locations and Directions:

Go South from Gastonia on 321. Take a Right onto Crawford Rd (SR 1108). Continue (ca. 0.8 miles) crossing Crowders Creek. The site is on the Left side of the road.

Landscape Description:

Aspect: N, NE **Slope:** **Elevation (ft above MSL):** 650-720

Topographic Position: Mid Slope, Alluvial Flat

Hydrology: Terrestrial, Palustrine **Moisture:** Seasonally Flooded, Mesic

Geology: (Zbt) Battleground Formation. Quartz-sericite schist with metavolcanic rock, quartz-pebble metaconglomerate, kyanite-sillimanite quartzite,and granite-quartz rock

Soils: N&E facing slopes:PaF-Pacelet sandy loam,25-45%slopes;W facingslopes:MaE-Madison sandy loam,15-25%slopes;W facing slopes:MaB2-Madison sandy loam2-8%slopes,eroded;Flood plain:Chewacla loam&Congareeloam

Comments on Physical Description:

The bulk of the floodplain forest has been destroyed by the erosion of woodland pasture. However, a large, frequently flooded area still exists & has a rich diversity of herbaceous aquatics. This area is bordering South Carolina.

BIOLOGICAL DESCRIPTION

A. Piedmont/Mountain Levee Forest, Piedmont Bottomland Hardwood Forest, Basic Mesic Mixed Forest.
B. The canopy included many bottomland trees such as Betula nigra, Celtis laevigata, Acer negundo, Q. michauxii and Juglans nigra.
The subcanopy included Liquidambar styraciflua, Fagus grandifolia, Q. phellos, Q. velutina, Nyssa sylvatica and Acer rubrum.
The shrub layer was somewhat dense, including Alnus serrulata, Castanea dentata, Rhododendron nudiflorum, Cornus alternifolia, Asimina triloba, Lindera benzoin, Corylus cornuta, Corylus americana and Viburnum dentatum and Xanthorhiza simplicissima.
The herb layer was very lush and fairly diverse. Species may include Erythronium americanum, Desmodium spp., Hepatica americana, Hypericum punctatum, Cicuta maculata, Peltandra virginica, Impatiens capensis, Arundinaria gigantea, Stellaria pubera, Trillium cernuum, Lilium michauxii and Arisaema triphyllum.
Ferns include Botrychium virginianum, Polystichum acrostichoides, Adiantum pedatum and Asplenium platyneuron. Vines include Toxicodendron radicans, Vitis rotundifolia, Parthenocissus quinquefolia and Lonicera japonica were prominent vines.
C. The presence of Betula nigra and Acer negundo indicate a levee forest, in a relatively disturbed area.
D. The site grades to a Bottomland Hardwood Forest, even a Basic Mesic Mixed Forest on the higher elevation slopes. Elevation ranges from 650-720 ft. The quality of this site was fair.
F. Approx. 32 acres.

Site Integrity: Fair **Fire regime:** Apparently fire may have been used to clear land for pasture. The most recent fire was approximately 2 years ago.

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B12 **NAME OF SITE:** Penegar, Gastonia South

Maximum DBH of canopy trees: 27" **Average DBH of canopy trees:** 16"

Logged (y/n): No **Stream channelized (y/n):** No

Even-aged canopy (y/n): No **Dredging/filling (y/n):** No

Non-native / weedy species present (y/n): Yes **Understory cleared (y/n):** No

Ditched/drained (y/n): No **Grazing (y/n):** Yes

Comments on Biological Description:

Non-native: Lonicera japonica. Woodland pasture along the creek.

ADJACENT LAND USE: Residential

PROTECTION / MANAGEMENT NEEDS:

DOCUMENTATION:

Crowders Church Rd and Crowders Creek served as survey boundaries on the N-W side of the site. UNCC herbarium. Topo map attached.

PLANT SPECIES LIST:

CANOPY: Quercus rubra, Pinus echinata, Pinus virginiana, Liriodendron tulipifera, Carya glabra, Juglans nigra, Betula nigra, Carya cordiformis, Q. michauxii, Fraxinus spp., Acer negundo.

SUBCANOPY: Celtis laevigata, Cornus florida, Acer rubrum, Q. prinus, Oxydendrum arboreum, Nyssa sylvatica, Liquidambar styraciflua, Fagus grandifolia, Q. velutina, Q. phellos, Q. alba, Morus rubra, Cercis canadensis, Acer negundo, Ulmus rubra, Juniperus virginiana, Prunus serotina.

SHRUBS: Alnus serrulata, Castanea dentata, Euonymus americana, Rhododendron nudiflorum, Cornus alternifolia, Viburnum prunifolium, Ilex decidua, Asimina triloba, Lindera benzoin, Corylus americana, Hamamelis virginica, Sambucus canadensis, Staphylea trifolia, Viburnum dentatum, Leucothoe spp., Hydrangea arborescens, Xanthorhiza simplicissima.

VINES: Parthenocissus quinquefolia, Vitis rotundifolia, Lonicera japonica, Dioscorea villosa, Anisostichus capreolata, Smilax herbacea, Toxicodendron radicans.

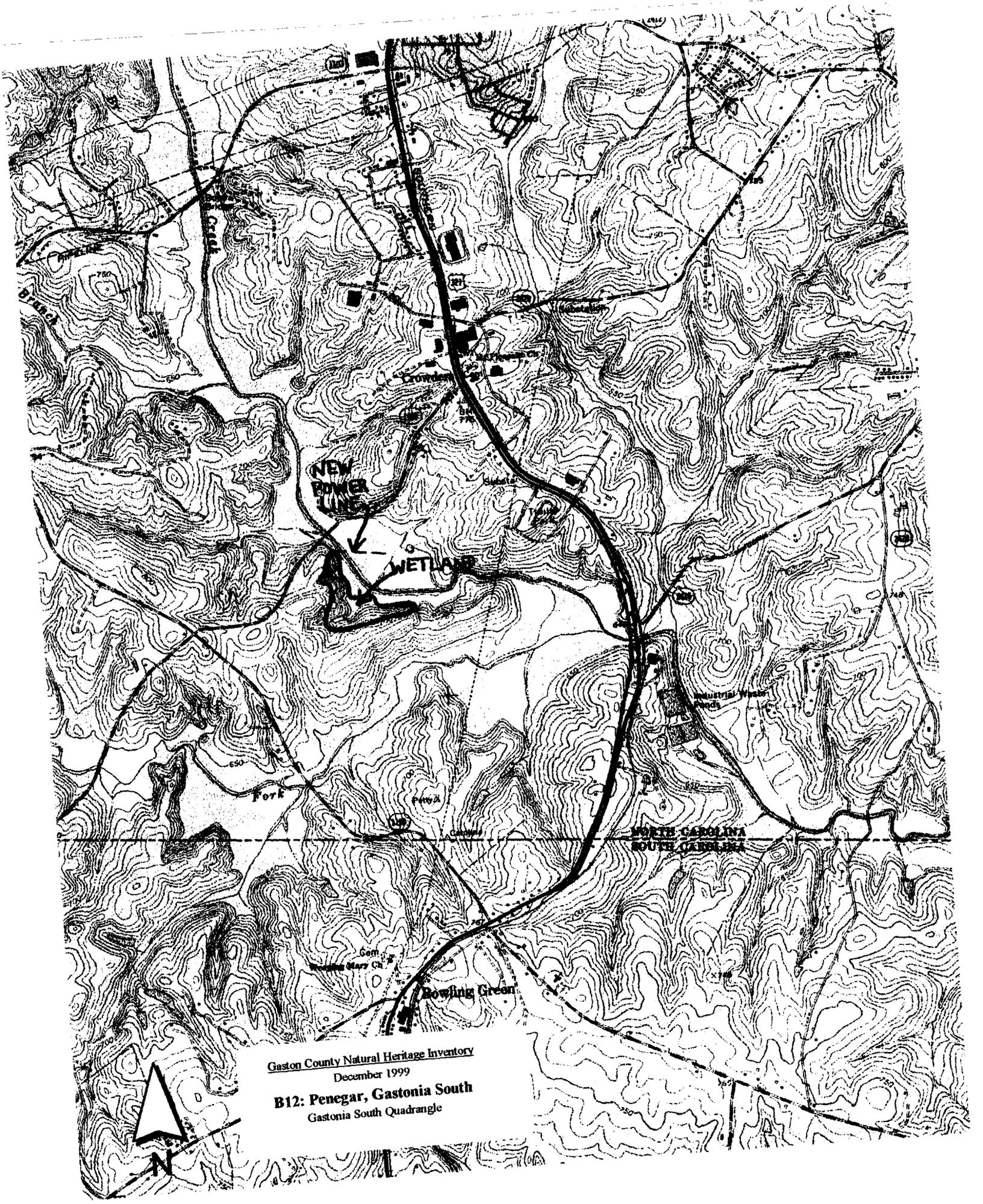
HERBS: Collinsonia canadensis, Geranium maculatum, Erythronium americanum, Glecoma hederacea, Aureolaria virginica, Smilacina racemosa, Desmodium spp., Hepatica americana, Uvularia perfoliata, Hypericum punctatum, Sagittaria spp., Cicuta maculata, Peltandra virginica, Impatiens capensis, Laportea canadensis, Arundinaria gigantea, Trillium cernuum, Viola spp., Galium spp., Mitchella repens, Chimaphila maculata, Chamaelirium luteum, Aristolochia serpentaria, Stellaria pubera, Sanguinaria canadensis, Polygonatum biflorum, Heuchera americana, Trillium catesbaei ,Lilium michauxii, Cimicifuga racemosa, Ligusticum canadense, Asarum canadense, Scutellaria elliptica, Salvia lyrata, Arisaema triphyllum, Goodyera pubescens, Microstegium vimineum, Asarum canadense, Cynoglossum virginianum, Phryma leptostachya, Tiarella cordifolia, Iris cristata, Podophyllum peltatum, Houstonia spp.,

FERNS: Polystichum acrostichoides, Asplenium platyneuron, Botrychium virginianum, Adiantum pedatum, Lycopodium lucidulum.

ANIMAL SPECIES LIST:

DATE: 06-Jun-97 **UPDATES:**

OWNER NAME: Private



Gaston County Natural Heritage Inventory

December 1999

B12: Penegar, Gastonia South

Gastonia South Quadrangle

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B13 **NAME OF SITE:** Ferguson Ridge Road

Size: 7 acres **Quadrangle:** Gastonia South
Province: PIEDMONT **Watershed:** Crowders Creek

Site Significance:
COUNTY (Good species diversity, with slope and wetland.)

Special Status Species (attach EORs):

Potential for other Special Status Species:

Other noteworthy species or features present: The rich diversity of species makes the site outstanding.

PHYSICAL DESCRIPTION

Nice. N, NE facing beech slopes with a wetland area along the toe of the slope.

Locations and Directions:

From Gastonia, take 321S to SR 1108 (Crawford Rd). Turn Right. Continue - crossing Crowders Creek and Ferguson Rd. The site is (0.6miles) on the Left side of the road. Walk in through S. Crowders Creek.

Landscape Description:

Aspect: N, NE **Slope:** Flat, 0-5-10-35 **Elevation (ft above MSL):** 650-740

Topographic Position: Mid and Lower Slope, Alluvial Floodplain

Hydrology: Terrestrial, Palustrine **Moisture:** Inundated, Frequently Flooded, Dry Mesic

Geology: (Zbt) Battleground Formation. Quartz-sericite schist with metavolcanic rock, quartz-pebble metaconglomerate. PPmg-foliated to massive Granitic rock(Pennsylvanian to Permian, 270-230my)

Soils: CH-Chewacla loam, frequently flooded 1/; PaF-Pacolet sandy loam, 25-45% slopes; MaE-Madison sandy lo 25% slopes; CO-Congaree loam, occasionally flooded

Comments on Physical Description:

Much of the site has been timbered and now is utilized as pasture, with the exception of the eastern most portion between the creek and the state line. This area contains nice beech slopes and a fairly nice wetland.

BIOLOGICAL DESCRIPTION

I. N-NE facing slope:
A. Mesic Mixed Hardwood Forest.
B. The canopy includes Fagus grandifolia, Quercus alba, Quercus michauxii, Liriodendron tulipifera and Quercus rubra. The subcanopy includes Acer rubrum, Cornus florida, Tilia heterophylla, Carya tomentosa, Magnolia tripetala, Nyssa sylvatica and Carpinus caroliniana.
Typical shrubs are Corylus americana, Castanea pumilla, Rhododendron nudiflorum, Styrax spp., Symplocos tinctoria, Cornus alternifolia, Asimina triloba, Staphylea trifolia, Viburnum prunifolium, V. acerifolium, Hydrangea arborescens and Crataegus spp.
Dominant vines were Toxicodendron radicans and Lonicera japonica.
The herbaceous layer was dense to moderately dense and diverse. Species include Hieracium venosum, Hepatica americana, Epifagus virginiana, Uvularia perfoliata, Monotropa uniflora, Arisaema triphyllum, Sanguinaria canadensis, Thalictrum thalictroides, Medeola virginiana, Trillium catesbaei, Aristolochia serpentaria, Tiarella cordifolia, Lilium michauxii and Verbesina spp. Ferns include Polystichum acrostichoides, Botrychium virginianum, Thelypteris hexagonoptera, Adiantum pedatum and Athyrium asplenioides.
C. Fagus grandifolia dominated the canopy.
D. The slope area is fairly steep and grades down to a Piedmont Swamp Forest.
E. The quality is fair to good due to rich species composition.
F. Approx. 7 acres.
II. Wetland area:
A. Piedmont Bottomland Forest and Piedmont Semipermanent Impoundment.
B. The canopy is dominated by Fraxinus pennsylvanica. Other canopy species include Quercus falcata, Betula

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B13 **NAME OF SITE:** Ferguson Ridge Road

nigra, Liquidambar styraciflua, Salix nigra, Acer rubrum and Acer negundo.
Subcanopy species include Alnus serrulata, Cornus amomum and Quercus phellos.
Shrubs include Itea virginica, Cephalanthus occidentalis, Sambucus canadensis, Xanthorhiza simplicissima and Leucothoe axillaris var. editorum.
The herbaceous layer includes Boehmeria cylindrica, Peltandra virginica, Lobelia cardinalis, Impatiens capensis, Sagittaria spp., Alisma subcordatum, Cicuta maculata and Cryptotaenia canadensis. C. Fraxinus pennsylvanica were dominant in the canopy.
D. The wetland area is located at the toe of the Beech slope and grades into a Piedmont Semipermanent Impoundment.
E. This area is in fair condition. The quality of the site is heightened by its species diversity and richness.
F. Approx. 7 acres.

Site Integrity: Good **Fire regime:**

Maximum DBH of canopy trees: 24" **Average DBH of canopy trees:** 15"

Logged (y/n): Yes **Stream channelized (y/n):** No

Even-aged canopy (y/n): No **Dredging/filling (y/n):** No

Non-native / weedy species present (y/n): Yes **Understory cleared (y/n):** No

Ditched/drained (y/n): No **Grazing (y/n):** Yes

Comments on Biological Description:

Timbering recent (within the last year in bottomlands). Lonicera japonica, Ligustrum sinense, Rubus spp., Baccharis halimifolia.

ADJACENT LAND USE: Woodland Pasture, Residential

PROTECTION / MANAGEMENT NEEDS:

DOCUMENTATION:
UNCC Herbarium. Topo map attached.

PLANT SPECIES LIST:
SLOPE
CANOPY: Fagus grandifolia, Quercus alba, Carya ovata, Quercus michauxii, Liriodendron tulipifera, Quercus rubra.
SUBCANOPY: Corylus americana, Acer rubrum, Cornus florida, Castanea pumila, Oxydendrum arboreum, Tilia heterophylla, Carya tomentosa, Magnolia tripetala, Nyssa sylvatica, Morus rubra, Cercis canadensis, Carpinus caroliniana.
SHRUBS: Rhododendron nudiflorum, Styrax spp., Symplocos tinctoria, Cornus alternifolia, Asimina triloba, Wisteria sinensis, Staphylea trifolia, Calycanthus floridus, Viburnum prunifolium, V. acerifolium, Euonymus americanus, Hydrangea arborescens, Crataegus spp.
VINES: Campsis radicans, Smilax spp., Lonicera japonica, Toxicodendron radicans, Parthenocissus quinquefolia, Matalea spp., Vitis rotundifolia, Dioscorea villosa.
HERBS: Hieracium venosum, Hepatica americana, Chamaelirium luteum, Epifagus virginiana, Uvularia perfoliata, Goodyera pubescens, Collinsonia canadensis, Monotropa uniflora, Arisaema triphyllum, Geranium maculatum, Thalictrum thalictroides, Sanguinaria canadensis, Podophyllum peltatum, Medeola virginiana, Cimicifuga racemosa, Smilacina racemosa, Trillium catesbaei, Desmodium spp., Aristolochia serpentaria, Tiarella cordifolia, Iris cristata, Polygonatum biflorum, Chimaphila maculata, Lilium michauxii, Viola spp., Verbesina spp.
FERNS: Polystichum acrostichoides, Botrychium virginianum, Thelypteris hexagonoptera, Adiantum pedatum, Athyrium asplenioides.
WEEDY SPECIES: Ligustrum sinense, Lonicera japonica, Rubus spp., Baccharis halimifolia.
WETLAND
CANOPY: Fraxinus pennsylvanica, Quercus falcata, Betula nigra, Liquidambar styraciflua, Salix nigra, Acer rubrum, Acer negundo.
SUBCANOPY: Alnus serrulata, Cornus amomum, Quercus phellos.

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

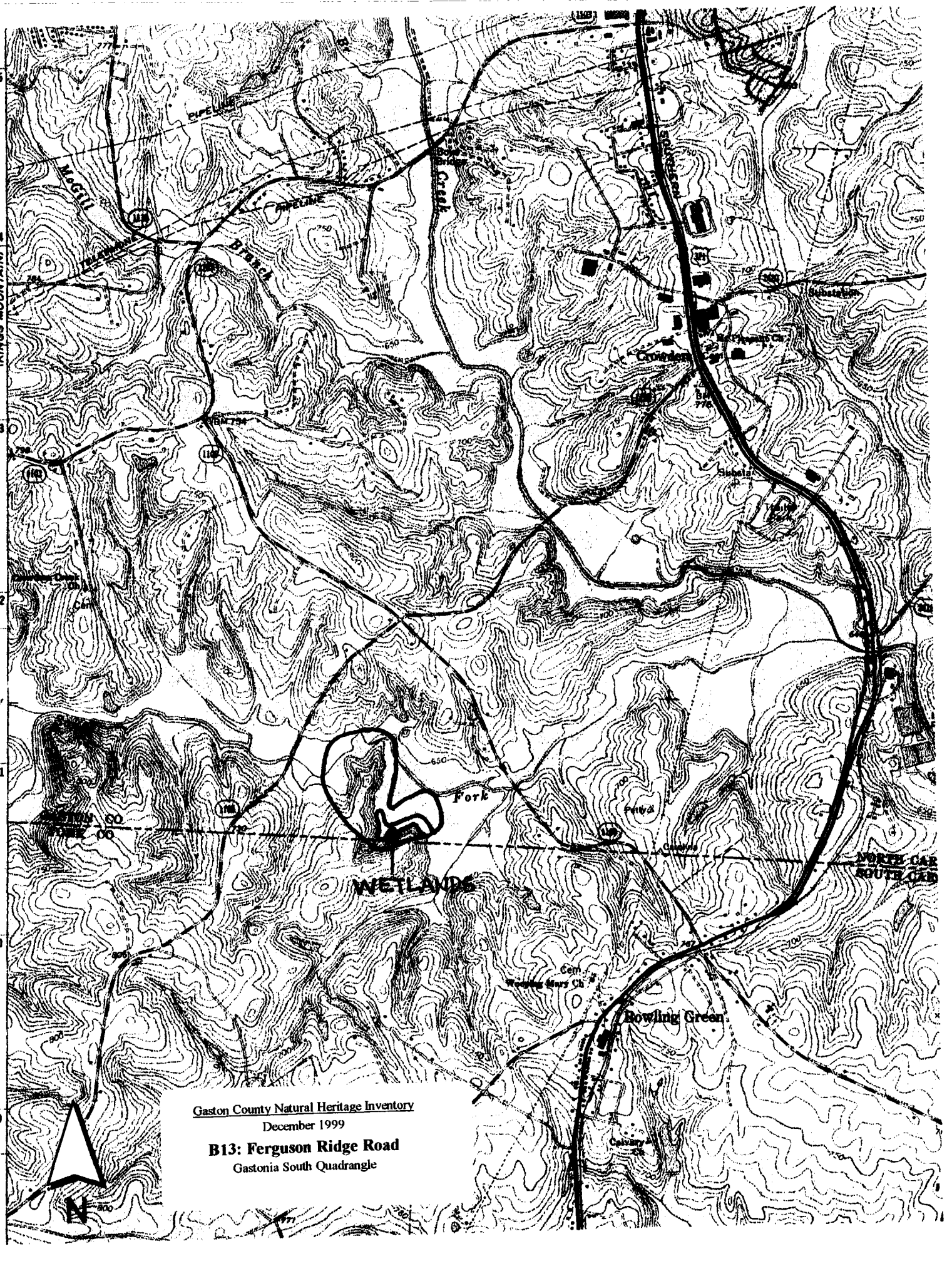
SITE NUMBER: B13 **NAME OF SITE:** Ferguson Ridge Road

SHRUBS: Itea virginica, Arundinaria gigantea, Cephalanthus occidentalis, Ilex opaca, Sambucus canadensis, Leucothoe axillaris var. editorum, Xanthorhiza simplicissima.
VINES: Campsis radicans, Smilax spp., Lonicera japonica, Toxicodendron radicans, Parthenocissus quinquefolia, Matalea spp., Vitis rotundifolia, Dioscorea villosa.
HERBS: Boehmeria cylindrica, Peltandra virginica, Lobelia cardinalis, Impatiens capensis, Phytolacca americana, Galium spp., Sagittaria spp., Alisma subcordatum, Cicuta maculata, Myriophyllum brasiliense, Microstegium vimineum, Polygonum spp., Cryptotaenia canadensis.
FERNS: Polystichum acrostichoides, Botrychium virginianum, Thelypteris hexagonoptera, Adiantum pedatum, Athyrium asplenioides.
WEEDY SPECIES: Ligustrum sinense, Lonicera japonica, Rubus spp., Baccharis halimifolia.

ANIMAL SPECIES LIST:

DATE: 23-Jun-97 **UPDATES:**

OWNER NAME: Private


WETLANDS
Gaston County Natural Heritage Inventory
December 1999
B13: Ferguson Ridge Road
Gastonia South Quadrangle
N
McGill
Branch
Creek
Fork
Bowling Green
Cowan
Sub-station
PIPELINE
4754 III NE
(KINGS MOUNTAIN)

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B14 **NAME OF SITE:** Ferguson's Knob

Size: 96 acres **Quadrangle:** Gastonia South
Province: PIEDMONT **Watershed:** Crowders Creek

Site Significance:
COUNTY (Overall community type.)

Special Status Species (attach EORs): Panax quinquefolium
Potential for other Special Status Species:
Other noteworthy species or features present: Asarum canadense

PHYSICAL DESCRIPTION

A steep rocky knob just south of South Fork Crowders Creek.

Locations and Directions:

North of NC-SC line, West of Crowders Church Rd, South of S. Crowders Creek.

Landscape Description:

Aspect: W, N, E **Slope:** 8-45 % **Elevation (ft above MSL):** 650-850

Topographic Position: Crest, Upper/Mid/Lower Slopes

Hydrology: Terrestrial **Moisture:** Xeric, Dry Mesic, Mesic

Geology: Zbs - Quartz-sericite schist, Phs-High Shoals Granite, Qal-Alluvium (Holocene)

Soils: TaE, TaD, UwF, CH

Comments on Physical Description:

The knob is mesic along the creek but very dry and rocky on top. Slopes are xeric.

BIOLOGICAL DESCRIPTION

A. Chestnut Oak Forest, Piedmont Alluvial Forest.
B. Canopy, subcanopy, shrub and herb layers are well developed, with good diversity of species at all levels.
C. The upland canopy is dominated by Quercus prinus and Q. coccinea. The subcanopy contains Cary glabra, Oxydendrum arboreum and C. tomentosa. The shrub layer has Euonymus americana, Corylus cornuta and Asimina parviflora. The herb layer is notable for containing Panax quinquefolium. The alluvial forest canopy is dominated by Acer rubrum, Quercus michauxii, and Betula nigra. The subcanopy includes Acer negundo, Liquidambar styraciflua, Ulmus rubra and Asimina triloba. The shrub layer has Xanthorhiza simplicissima, Leucothoe axillaris var. editorum and Ilex decidua. The herb layer is notable for containing Asarum canadense.
D. The upland is a Chestnut Oak Forest which grades into a Piedmont Alluvial Forest along South Fork Crowders Creek.
E. This site has good integrity.
F. Ca. 96 acres.

Site Integrity: Good **Fire regime:** None noted.

Maximum DBH of canopy trees: 19" **Average DBH of canopy trees:** 12"

Logged (y/n): No **Stream channelized (y/n):** No

Even-aged canopy (y/n): No **Dredging/filling (y/n):** No

Non-native / weedy species present (y/n): No **Understory cleared (y/n):** No

Ditched/drained (y/n): No **Grazing (y/n):** No

Comments on Biological Description:

This site (slopes) has several species more commonly found in the mountains. Magnolia acuminata, Azalea spp., Cornus alternifolia and Panax quinquefolium are a few examples. The area along the South Fork Catawba and its tributaries has a rich mix of herbaceous species.

ADJACENT LAND USE: Farm

PROTECTION / MANAGEMENT NEEDS:

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B14 **NAME OF SITE:** Ferguson's Knob

DOCUMENTATION:
UNCC

PLANT SPECIES LIST:
CANOPY: Quercus prinus, Q. coccinea, Q. velutina, Nyssa sylvatica, Q. rubra, Q. alba, Carya glabra, C. tomentosa, Pinus virginiana, P. echinata, Q. nigra, Q. falcata, Fagus grandifolia, Q. marilandica, Q. michauxii, Acer rubrum.
SUBCANOPY: Carya cordiformis, C. tomentosa, Liquidambar styraciflua, Magnolia tripetela, Ulmus rubra, Asimina triloba, Acer negundo, A. rubrum, Pinus virginiana, Salix nigra, Juniperus virginiana, Ilex opaca, Carpinus caroliniana, Magnolia acuminata, Quercus phellos, Pinus echinata, Cercis canadensis, Ulmus spp., Tilia spp., Fraxinus spp., Quercus falcata, Rhamnus caroliniana, Castanea dentata, Nyssa sylvatica, Diospyros virginiana, Oxydendrum arboreum.
SHRUBS: Kalmia latifolia, Sambucus canadensis, Elaeagnus umbellata, Hamamelis virginiana, Chionanthus virginicus, Viburnum prunifolium, V. dentatum, V. nudum, Alnus serrulata, Corylus americana, Staphylea trifolia, Cornus florida, Prunus serotina, Xanthorhiza simplicissima, Asimina triloba, Hydrangea arborescens, Cornus alternifolia, Corylus cornuta, Carpinus caroliniana, Asimina parviflora, Sassafras albidum, Morus rubra, Ilex decidua, Calycanthus floridus, Rhododendron nudiflorum, Euonymus americanus, Leucothoe axillaris var. editorum Arundinaria gigantea.
VINES: Smilax spp., Vitis rotundifolia, Parthenocissus quinquefolia, Toxicodendron radicans, Lonicera japonica, Anisostichus capreolata, Dioscorea villosa.
HERBS: Helianthus microcephalus, Geum spp., Eupatorium perfoliatum, Euphorbia corollata, Hepatica americana, Iris cristata, Boehmeria cylindrica, Sagittaria spp., Mitchella repens, Sanicula spp., Medeola virginiana, Geranium maculatum, Microstegium vimineum, Goodyera pubescens, Commelina communis, Heuchera americana, Elephantopus carolinianus, Aquilegia canadensis, Impatiens capensis, Anemone virginiana, Lobelia cardinalis, Scutellaria lateriflora, Verbascum thapsus, Ambrosia spp., Desmodium spp., Aristolochia serpentaria, Baptisia tinctoria, Viola spp., Prenanthes spp., Ligusticum canadense, Polygonatum biflorum, Smilacina racemosa, Tiarella cordifolia var. collina, Coreopsis major, Sanguinaria canadensis, Chimaphila maculata, Goodyera pubescens, Tipularia discolor, Cimicifuga racemosa, Epigea repens, Arisaema triphyllum, Trillium catesbaei, Asarum canadense, Scutellaria elliptica, Schrankia microphylla, Panax quinquefolium, Houstonia purpurea, Phryma leptostachya, Collinsonia canadensis, Hypericum spp., Amianthium muscaetoxicum, Aureolaria spp., Uvularia perfoliata, Arabis canadensis, Chamaelirium luteum, Cynoglossum virginianum, Ruellia spp.
FERNS: Polystichum acrostichoides, Botrychium virginianum, Asplenium platyneuron, Thelypteris hexagonoptera, T. noveboracensis, Polypodium polypodioides, Woodwardia areolata, Osmunda cinnamomea, Lycopodium flabelliforme, Selaginella apoda.

ANIMAL SPECIES LIST:

DATE: 01-Aug-97 **UPDATES:** 24-Sep-1997

OWNER NAME: Private

Gaston County Natural Heritage Inventory

December 1999

B14: Ferguson's Knob

Gastonia South Quadrangle

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B15 **NAME OF SITE:** Unity Church Road

Size: ca. 100 acres **Quadrangle:** Kings Mtn.
Province: PIEDMONT **Watershed:** Crowders Creek

Site Significance:
COUNTY (Monadnock community with wetlands at base of slope.)

Special Status Species (attach EORs):

Potential for other Special Status Species: Juniperus communis var. depressa

Other noteworthy species or features present:

PHYSICAL DESCRIPTION

Dry rocky ridge with a drainage to the North. There are several nice bog areas along the streams throughout this area.

Locations and Directions:

West of Unity Church Rd (SR1102) and South of Crowders Mountain State Park.

Landscape Description:

Aspect: N, E, W **Slope:** 0-35% **Elevation (ft above MSL):** 960-1246

Topographic Position: Crest, Upper/Mid/Lower Slopes

Hydrology: Terrestrial, Palustrine **Moisture:** Xeric, Frequently Flooded

Geology: Zbp - Schistose metavolcaniclastic rocks
Zbs-Quartz-serecite schist.

Soils: TaE, UwF, CH

Comments on Physical Description:

Ridge is very dry with exposed rock in places.

BIOLOGICAL DESCRIPTION

A. Piedmont Monadnock Forest, Dry-Mesic Oak-Hickory Forest, Low Elevation Seep.
B. On the upper slopes the canopy and subcanopy are not well developed and the shrub and herb layers are sparse due to the xeric nature of the forest. The lower slopes have well developed canopy, subcanopy, shrub and herb layers.
C. The upper slope canopy is dominated by Quercus prinus, with the subcanopy consisting of Acer rubrum, Oxydendrum arboreum and Nyssa sylvatica. The shrub layer consists of Vaccinium species with only about four species in the herb layer. The lower slopes have a mixture of oak species with Quercus alba being the most dominant. The subcanopy contains Magnolia tripetela, and the shrub layer has Hamamelis virginica, Castanea dentata stump sprouts and Lyonia ligustrina. Along the drainage are found Rhododendron nudiflorum and Viburnum nudum. The herb layer contains Baptisia tinctoria, Epigea repens, Amianthium muscaetoxicum, Galax aphylla and Lobelia cardinalis. Habenaria clavellata and Isoetes valida were found in the seeps.
D. The Monadnock Forest grades into a Dry-Mesic Oak-Hickory Forest, which grades into a Low Elevation Seep.
E. There are ORV trails in parts of the lower drainage and along the ridge tops.
F. ca. 100 acres.

Site Integrity: Good **Fire regime:** Evidence on ridge of past burning.

Maximum DBH of canopy trees: 20" **Average DBH of canopy trees:** 10"

Logged (y/n): No **Stream channelized (y/n):** No

Even-aged canopy (y/n): No **Dredging/filling (y/n):** No

Non-native / weedy species present (y/n): No **Understory cleared (y/n):** No

Ditched/drained (y/n): No **Grazing (y/n):** No

Comments on Biological Description:

Quercus alba is the dominant canopy tree of the lower elevation, while Quercus prinus is dominant at higher elevations.

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B15 **NAME OF SITE:** Unity Church Road

ADJACENT LAND USE: Hunting, Residential

PROTECTION / MANAGEMENT NEEDS:

Control of ORV traffic.

DOCUMENTATION:

PLANT SPECIES LIST:

CANOPY: Quercus falcata, Liquidambar styraciflua, Liriodendron tulipifera, Quercus alba, Q. prinus, Acer rubrum, Q. rubra, Q. coccinea, Oxydendrum arboreum, Q. marilandica, Fraxinus spp., Diospyros virginiana, Pinus echinata, P. virginiana.

SUBCANOPY: Magnolia tripetala, Nyssa sylvatica, Prunus serotina, Acer rubrum, Carya tomentosa, Pinus virginiana, Castanea pumila, Robinia pseudo-acacia, Castanea dentata, Oxydendrum arboreum, Diospyros virginiana, Cornus amomum, Chionanthes virginicus.

SHRUBS: Lindera benzoin, Kalmia latifolia, Viburnum nudum, Calycanthus floridus, Alnus serrulata, Asimina parviflora, Vaccinium spp., Rhododendron nudiflorum, Xanthorhiza simplicissima, Sassafras albidum, Cornus florida, Hamamelis virginiana, Lyonia ligustrina

VINES: Toxicodendron radicans, Vitis rotundifolia, Smilax ecirrhata, Mikania scandens, Dioscorea villosa, Parthenocissus quinquefolia, Smilax spp.

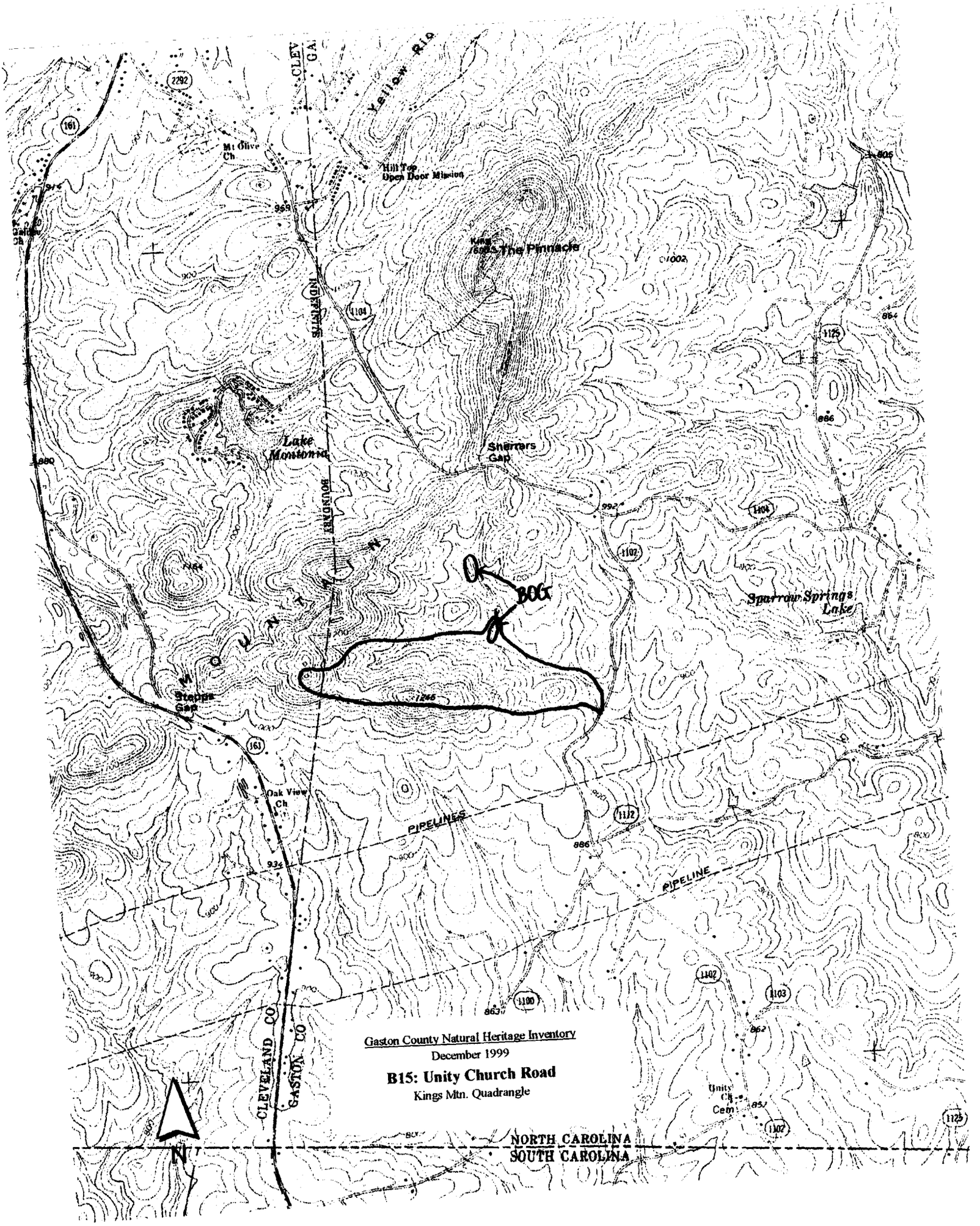
HERBS: Arisaema triphyllum, Impatiens capensis, Viola spp., Mitchella repens, Hexastylis minor, Arundinaria gigantea, Monotropa uniflora, Lobellia cardinalis, Chimaphila maculata, Solidago odora, Baptisia tinctoria, Epigea repens, Aureolaria spp., Coreopsis major, Asclepias spp., Uvularia sessilifolia, Smilacina racemosa, Goodyera pubescens, Aster spp., Tipularia discolor, Chamaelirium luteum, Euphorbia corollata, Antennaria solitaria, Galax aphylla, Polygonatum biflorum, Ligusticum canadense, Desmodium spp., Iris verna, Medeola virginiana, Amianthium muscaetoxicum, Silphium compositum, Habenaria clavellata.

FERNS: Athyrium asplenioides, Osmunda regalis, Thelypteris noveboracensis, Osmunda cinnamomea, Woodwardia areolata, Pteridium aquilinum, Asplenium platyneuron, Isoetes valida.

ANIMAL SPECIES LIST:

DATE: 26-Aug-97 **UPDATES:**

OWNER NAME: Private



Gaston County Natural Heritage Inventory

December 1999

B15: Unity Church Road

Kings Mtn. Quadrangle

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B16 **NAME OF SITE:** Catawba Cove

Size: 0.2 acres **Quadrangle:** Belmont
Province: PIEDMONT **Watershed:** Catawba Creek

Site Significance:
COUNTY (Helianthus schweinitzii site.)

Special Status Species (attach EORs): Helianthus schweinitzii

Potential for other Special Status Species:

Other noteworthy species or features present:

PHYSICAL DESCRIPTION

On North and South sides of Catawba Cove Dr, in roadside ditch and on banks.

Locations and Directions:

Site is O.7 mile NE from Rufus Ratchford Rd, SR 2431, on Catawba Cove Dr, SR 2650.

Landscape Description:

Aspect: NE **Slope:** 5-20 **Elevation (ft above MSL):** 640

Topographic Position: Upper/Mid/Lower Slopes and Crest

Hydrology: Terrestrial **Moisture:** Dry

Geology:

Soils: Cecil (CeB2)

Comments on Physical Description:

BIOLOGICAL DESCRIPTION

A. Roadside - No natural classification.
B. NA
C. NA
D. NA
E. Exposed on dirt roadside.
F. 101-500 plants in the sunflower population as determined Oct. 1996. Road was paved in 1998. A survey on 30 June 1999, revealed roadside population was reduced to 2 plants on the North side and 20 plants on the South side. The power line ROW has a large population of 51-100 plants.

Site Integrity: **Fire regime:**

Maximum DBH of canopy trees: NA **Average DBH of canopy trees:** NA

Logged (y/n): No **Stream channelized (y/n):** No

Even-aged canopy (y/n): No **Dredging/filling (y/n):** No

Non-native / weedy species present (y/n): No **Understory cleared (y/n):** No

Ditched/drained (y/n): No **Grazing (y/n):** No

Comments on Biological Description:

ADJACENT LAND USE: Road and Successional Field

PROTECTION / MANAGEMENT NEEDS:

Potential threats: road is paved from site SE to Hwy 279. If portion of road where site is found is brought up to standards and paved, site may be reduced in size.

DOCUMENTATION:
UNCC

PLANT SPECIES LIST:
Roadside population of Helianthus schweinitzii.

ANIMAL SPECIES LIST:

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B16 **NAME OF SITE:** Catawba Cove

DATE: 14-Oct-96 **UPDATES:** 30 June 1999

OWNER NAME: Private

Gaston County Natural Heritage Inventory
December 1999

B16: Catawba Cove
Belmont Quadrangle

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B17 **NAME OF SITE:** Rhyne Bluffs

Size: 172 acres **Quadrangle:** Gastonia North
Province: PIEDMONT **Watershed:** Hoyle Creek

Site Significance:
COUNTY (Size and quality with good species.)

Special Status Species (attach EORs): Magnolia macrophylla

Potential for other Special Status Species:

Other noteworthy species or features present: Corydalis flavula, Asimina parviflora

PHYSICAL DESCRIPTION

W, NW facing slopes along the South Fork Catawba River.

Locations and Directions:

From Dallas, East on NC 275 (Dallas-Stanley Hwy), to SR 1836 (Old Willis School Rd). Continue to Sandcastle Rd (on Left). Continue until road dead ends. Mr. Rhynes' home is on the Right, just before the river bend.

Landscape Description:

Aspect: W, NW **Slope:** 10-35, 35+ **Elevation (ft above MSL):** 660-700

Topographic Position: Upper/Mid/Lower Slopes

Hydrology: Terrestrial **Moisture:** Seasonally Wet, Mesic, Dry Mesic

Geology: Zbs - Battleground Formation. Quartz-sericite schist Phs - High Shoals Granite

Soils: CeBA-Cecil sandy clay loam, 2-8% slopes, eroded; PaF-Pacolet sandy loam, 25-45% slopes; MaBZ-Madiso clay loam, 2-8% slopes, eroded

Comments on Physical Description:

(Erosion, sewer & power line ROW, outcropping, etc.) Portions of the slope were disturbed due to disposal of agricultural waste (metal & organic). Northern portion of the slope has the best integrity; just before reaching the cabin site.

BIOLOGICAL DESCRIPTION

A. Mesic Mixed Hardwood Forest, Piedmont Low Mountian Alluvial Forest, Dry-Mesic Oak-Hickory Forest
B. Canopy dominated by Quercus alba, Quercus rubra, Carya glabra, Liriodendron tulipifera. Subcanopy includes Acer rubrum, Cornus florida, Magnolia macrophylla, Nyssa sylvatica, Oxydendrum arboreum, Ilex spp., Carpinus caroliniana and Halesia carolina. Shrubs species include Rhododendron maximum, Viburnum acerifolium, Kalmia latifolia, Chionanthus virginicus, Calycanthus floridus, Asimina parviflora, Leucothoe axillaris var. editorum and Rhododendron nudiflorum. The herb layer is fairly diverse, including Trillium catesbaei, Hepatica americana, Sanquinaria canadensis, Cardamine spp., Corydalis flavula, Chamaelirium luteum, Tipularia discolor, Tiarella cordifolia, Hexastylis minor, Lilium michauxii, Thalictrum thalictroides, Arisaema triphyllum, Cynoglossum virginianum, Cimicifuga racemosa, Polygonatum biflorum, Smilacina racemosa, Stellaria pubera, Coreopsis major, Uvularia perfoliata, Anisostichus capreolata, Dioscorea spp., Parthenocissus quinquefolia, Vitis spp. and Toxicodendron radicans. Some ferns include Polystichum acrostichoides, Asplenium platyneuron and Botrychium virginianum.
C. The more important species include Magnolia macrophylla, Asimina parviflora, Lilium michauxii, Trillium catesbaei and Corydalis flavula.
D. This site is positioned along the Catawba River bluff, containing W-NW facing slopes ranging in elevation from 660-700 feet. On the lower slopes, site may grade into Piedmont/Low Mtn. Alluvial Forest. Upland communities may grade into Dry-Mesic Oak-Hickory Forest.
E. Portions of the site were disturbed due to disposal of agricultural waste (metal and organic). The northern portion of the slope has the best integrity.
F. Approx. 172 acres.

Site Integrity: Good **Fire regime:**

Maximum DBH of canopy trees: 32" **Average DBH of canopy trees:** 24"

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B17 **NAME OF SITE:** Rhyne Bluffs

Logged (y/n): No
Stream channelized (y/n): No
Even-aged canopy (y/n): Yes
Dredging/filling (y/n): Yes
Non-native / weedy species present (y/n): Yes
Understory cleared (y/n): No
Ditched/drained (y/n): No
Grazing (y/n): No

Comments on Biological Description:

Non-native: Lonicera japonica, Ligustrum spp., Pueraria lobata. Some dredging along stream bank.

ADJACENT LAND USE: Agriculture, Residential Area

PROTECTION / MANAGEMENT NEEDS:

Control plan for Kudzu along the river; toe of the slope.

DOCUMENTATION:

Our survey area was between the river and adjacent land used for light agriculture.

PLANT SPECIES LIST:

CANOPY: Quercus rubra, Q. alba, Fagus grandifolia, Betula nigra.
SUBCANOPY: Querus nigra, Acer negundo, Magnolia macrophylla, Prunus serotina, Liriodendron tulipifera, Carya glabra, Fraxinus pennsylvanica, Halesia carolina, Ilex opaca, Carpinus caroliniana, Acer rubrum, Cornus florida, Amelanchier spp., Ulmus alata, Q. phellos, Juniperus virginiana, Tilia heterophylla, Nyssa sylvatica, Oxydendrum arboreum, Ilex ambigua, Platanus occidentalis, Styrax grandifolia.
SHRUBS: Rhododendron maximum, Hamamelis virginiana, Mitchella repens, Viburnum acerifolium, Chionanthus virginicus, Kalmia latifolia, Leucothoe axillaris, Calycanthus floridus, Rhododendron nudiflorum, Aesculus sylvatica, Asimina parviflora, Arundinaria gigantea, Vaccinium spp.
VINES: Toxicodendron radicans, Anisostichus capreolata, Parthenocissus quinquefolia, Vitis spp., Dioscorea villosa.
HERBS: Viburnum prunifolium, Uvularia perfoliata, Stellaria media, Galium spp., Smilacina racemosa, Coreopsis major, Polygonatum biflorum, Lilium michauxii, Hexastylis minor, Houstonia spp., Hieracium venosum, Saxifrage spp., Iris cristata, Epifagus virginiana, Chimaphila maculata, Tiarella cordifolia, Sassafras albidum, Euonymus americana, Tipularia discolor, Heuchera americana, Carex spp., Chamaelirium luteum, Trillium catesbaei, Thalictrum thalictroides, Impatiens capensis, Hepatica americana, Sanguinaria canadensis, Dentaria spp., Cardamine spp., Amianthium muscaetoxicum, Cimicifuga racemosa, Cynoglossum virginianum, Arisaema triphyllum, Salvia lyrata.
FERNS: Polystichum acrostichoides, Asplenium platyneuron, Botrychium virginianum.

ANIMAL SPECIES LIST:

DATE: 28-Mar-97 **UPDATES:** 29- Apr-97

OWNER NAME: Private

Gaston County Natural Heritage Inventory
December 1999

B17: Rhyne Bluffs
Gastonia North Quadrangle

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B18 **NAME OF SITE:** Thornburg Shoals Granitic Flatrock, Bottomland Fore

Size: 8 acres **Quadrangle:** Gastonia North
Province: PIEDMONT **Watershed:** Long Creek

Site Significance:
COUNTY

Special Status Species (attach EORs):
Potential for other Special Status Species:
Other noteworthy species or features present: Talinum teretifolium - Rock outcrop, Habenaria flava

PHYSICAL DESCRIPTION

Locations and Directions:

From Dallas, Northwest on 279 (Dallas-Cherryville Hwy). Turn Right on SR 1602 (Ashebrook Park Rd). Continue approximately 4 miles. Park on the Right and walk in through wetland area.

Landscape Description:

Aspect: All **Slope:** 0-5, 5-10, flat **Elevation (ft above MSL):** 760-800

Topographic Position: Upland Flat, Alluvial Flat

Hydrology: Terrestrial, Palustrine **Moisture:** Inundated, Frequently Flooded, Mesic

Geology: Phs - High Shoals Granite

Soils: CeO2-Cecil sandy clay loam, 8-15% slopes, eroded; CeB2-Cecil sandy clay loam, 2-8% slopes, eroded

Comments on Physical Description:

Much of the area, prior to reaching the shoals, was wetland.

BIOLOGICAL DESCRIPTION

A. Granitic Flatrock.
B. NA
C. NA
D. Sloping outcrop with falls
E. Good
F. 1.5 acres

Bottomland Forest
A. Piedmont/Bottomland Forest
B. Canopy trees include wetland types such as Acer rubrum or Liriodendron tulipifera and Liquidambar styraciflua. The Subcanopy includes Juglans nigra, Cornus florida, Itea virginica and Ulmus rubra. Shrubs include Sambucus canadensis, Xanthorhiza simplicissima, Arundinaria gigantea, Alnus serrulata, Cornus amomum, Viburnum nudum, Rhododendron nudiflorum and Chionanthus virginicus. Prominent vines include Lonicera japonica, Toxicodendron radicans, Vitis spp., Parthenocissus quinquefolia, Campsis radicans, Rubus spp. and Smilax spp. The herb layer is distinctively wetland species including Impatiens capensis, Peltandra virginica, Sagittaria spp., Carex (3+ spp.), Lobelia cardinalis, Habenaria flava, Hypericum walteri, and Glyceria striata. Ferns present are Asplenium platyneuron, Botrychium virginianum, Polystichum acrostichoides, Athyrium asplenioides, Woodwardia areolata, Polypodium polypodioides.
C. See species list.
D. This site falls between a field and SR 1601 with Little Long Creek cutting through W-E. Bottomland forest grades into the Upper Shoals (Rock outcrop). Below the forest is a floodplain area. E. The forest area is easily accessible and fairly diverse. ORVs have disturbed some portions although none are damaged beyond natural recovery.
F. ca. 7acres.

Site Integrity: Good **Fire regime:**

Maximum DBH of canopy trees: 28" **Average DBH of canopy trees:** 20"

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B18 **NAME OF SITE:** Thornburg Shoals Granitic Flatrock, Bottomland Fore

Logged (y/n): No
Stream channelized (y/n): No
Even-aged canopy (y/n): No
Dredging/filling (y/n): No
Non-native / weedy species present (y/n): Yes
Understory cleared (y/n): Yes
Ditched/drained (y/n): No
Grazing (y/n): No

Comments on Biological Description:

Non-native: Lonicera japonica, Ligustrum spp., Microstegium vimineum. Understory cleared. ORV damage through bottomland forest area.

ADJACENT LAND USE: Residential, Possibly light agriculture in adjacent field at road.

PROTECTION / MANAGEMENT NEEDS:

Bottomland forest area should be protected from ORVs.

DOCUMENTATION:
UNCC

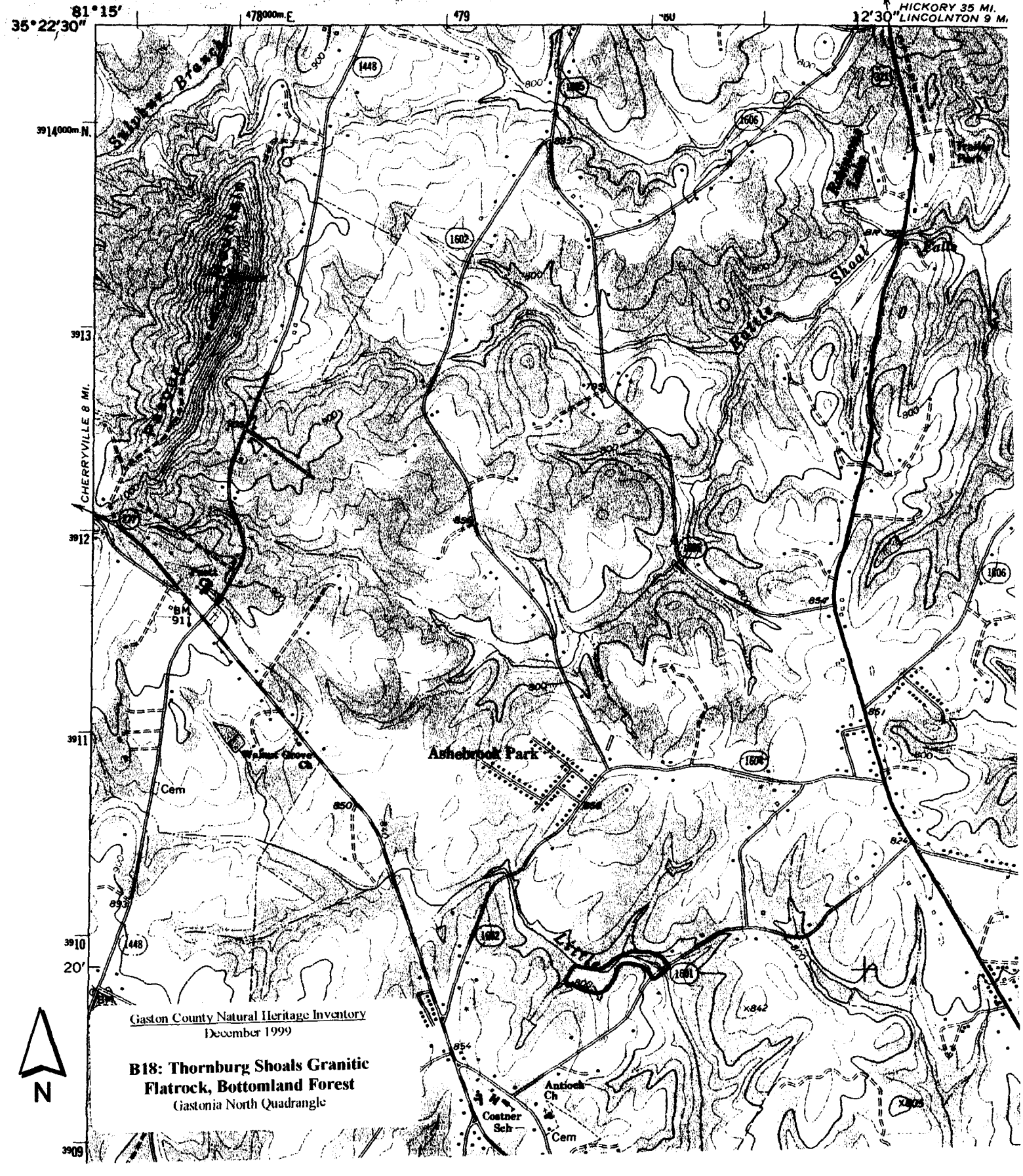
PLANT SPECIES LIST:
CANOPY: Liriodendron tulipifera, Liquidambar styraciflua, Acer rubrum, Juniperus virginiana, Quercus alba.
SUBCANOPY: Juglans nigra, Acer rubrum, Cornus florida, Liquidambar styraciflua, Prunus americana, Itea virginica, Ulmus rubra, Fraxinus spp.
SHRUBS: Sambucus canadensis, Ligustrum sinense, Arundinaria gigantea, Alnus serrulata, Rosa spp., Viburnum dentatum, Cornus amomum, Viburnum nudum, Ilex opaca, Rhododendron nudiflorum, Chionanthus virginicus, Xanthorhiza simplicissima, Castanea dentata, Itea virginica.
VINES: Lonicera japonica, Vitis rotundifolia, Parthenocissus quinquefolia, Campsis radicans, Toxicodendron radicans, Rubus spp., Smilax spp., Lonicera sempervirens, Apios americana.
HERBS: Microstegium vimineum, Stellaria spp., Impatiens spp., Viola spp., Phytolacca americana, Peltandra virginica, Lobelia cardinalis, Polygonatum biflorum, Carex spp., Salvia spp., Talinum teretifolium, Linaria canadensis, Polygonatum biflorum, Sisyrinchium spp., Houstonia spp., Hexastylis minor, Hepatica americana, Heuchera americana, Sanguinaria canadensis, Thalictrum thalictroides, Lilium michauxii, Smilax ecirrhata, Chamaelirium luteum, Glyceria striata, Peltandra virginica, Sagittaria spp., Carex mitchelliana, Lobelia cardinalis, Mitchella repens, Habenaria flava, Hypericum walteri, Juncus spp., Eupatorium fistulosum, Aster spp., Talinum teretifolium.
FERNS: Asplenium platyneuron, Osmunda cinnamomea, Botrychium virginianum, Polystichum acrostichoides, Athyrium asplenioides, Woodwardia areolata, Polypodium polypodioides, Sphagnum spp., Mosses (3+ spp.) Selaginella rupestris (on rock outcrop), Isoetes valida.

ANIMAL SPECIES LIST:

DATE: 07-May-97 **UPDATES:** 18- June-97; 8-Aug-97

OWNER NAME: Private

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



Gaston County Natural Heritage Inventory
December 1999

B18: Thornburg Shoals Granitic Flatrock, Bottomland Forest
Gastonia North Quadrangle

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B19 **NAME OF SITE:** Sumner Road

Size: 69 acres **Quadrangle:** Mt. Holly
Province: PIEDMONT **Watershed:** South Fork Catawba

Site Significance:
COUNTY (This site is significant for the presence of Aster georgianus.)

Special Status Species (attach EORs): Aster georgianus
Potential for other Special Status Species: Aster phlogifolius
Other noteworthy species or features present: Aster phlogifolius
Archeological site for old wagon crossing.

PHYSICAL DESCRIPTION

Steep West facing slope along the South Fork Catawba River, including an East-facing disturbed slope.

Locations and Directions:

From Stanley, take Hickory Grove Rd (South). Right on to Turner Rd. Right on to Sumner Rd.

Landscape Description:

Aspect: S, W, E **Slope:** 5-35 degrees **Elevation (ft above MSL):** 600-700

Topographic Position: Crest to Floodplain

Hydrology: Terrestrial **Moisture:** Frequently Flooded, Mesic, Dry Mesic

Geology: Mvf - Felsic metavolcanic rocks

Soils: PaE, GaD2, GaB2, CH, Co

Comments on Physical Description:

BIOLOGICAL DESCRIPTION

A. Dry-Mesic Oak-Hickory Forest, grading into an Alluvial Forest.
B. The canopy species are not large, probably due to previous timbering. However, the shrub layer is very well developed due to the increased light. The subcanopy species change from the top of the hill toward the river. The herbaceous layer also is well developed.
C. The canopy species are Quercus alba, Fagus grandifolia and Liriodendron tulipifera, with Q. rubra and Carya spp. in lesser amounts. The subcanopy in the drier area consists of Nyssa sylvatica, Cornus florida and Oxydendrum arboreum; while toward the more mesic soils Betula nigra and Fraxinus pennsylvanica become abundant. The shrubs include Kalmia latifolia, Rhododendron nudiflorum, Leucothoe axillaris var. editorum, Styrax grandifolia, Xanthorhiza simplicissima and Corylus americana. The herb layer is diverse, including Aster georgianus, Phlox nivalis, Cocculus carolina, Agave virginica, Silphium dentatum, Coreopsis major and Allium canadense. There also appears to be Aster phlogifolius in this community.
D. Grades from a Dry to Mesic forest into the floodplain.
E. Fair to good integrity, with timbering in the past, not recently.
F. 69 acres.

Site Integrity: Fair on E exposure, Good on W exposure **Fire regime:** None noted.

Maximum DBH of canopy trees: 22" **Average DBH of canopy trees:** 11"

Logged (y/n): No **Stream channelized (y/n):** No

Even-aged canopy (y/n): No **Dredging/filling (y/n):** No

Non-native / weedy species present (y/n): No **Understory cleared (y/n):** No

Ditched/drained (y/n): No **Grazing (y/n):** No

Comments on Biological Description:

Field survey sheet for Aster georgianus sent to NHP on 13-Aug-97.

ADJACENT LAND USE: Residential

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B19 **NAME OF SITE:** Sumner Road

PROTECTION / MANAGEMENT NEEDS:

Notify Mr. Sumner of the location of the Aster georgianus, so he will avoid managing that area.

DOCUMENTATION:

Survey stopped at the drainage to the North because of evidence of extensive poor management of the woods. The southern boundary is Mr. Sumner's property line. Specimens collected and housed at UNCC Herbarium.

PLANT SPECIES LIST:

Strata include species from both dry hilltops to floodplain along the river since the site could not be easily divided.
CANOPY: Quercus alba, Liriodendron tulipifera, Q. rubra, Fagus grandifolia, Carya glabra, Pinus virginiana, Q. nigra, Platanus occidentalis, Q. michauxii.
SUBCANOPY: Nyssa sylvatica, Acer rubrum, Cornus florida, Fagus grandifolia, Juniperus virginiana, Morus rubra, Albizia julibrissen, Fraxinus pennsylvanica, Betula nigra, Quercus phellos, Celtis laevigata, Oxydendrum arboreum, Crataegus spp., Diospyros virginiana.
SHRUBS: Corylus americana, Prunus serotina, Rhododendron nudiflorum, Ilex opaca, Albizia julibrissin, Carpinus caroliniana, Styrax grandifolia, Elaeagnus umbellata, Cercis canadensis, Euonymus spp., Viburnum dentatum, Sassafras albidum, Kalmia latifolia, Leucothoe axillaris var. editorum, Morus rubra, Amelanchier spp., Hypericum spp., Arundinaria gigantea, Chionanthus virginicus, Xanthorhiza simplicissima, Alnus serrulata.
VINES: Vitis rotundifolia, Smilax spp., Parthenocissus quinquefolia, Anisostichus capreolata, Lonicera japonica, Toxicodendron radicans, Passiflora lutea, Clematis viorna, Campsis radicans, Matalea spp.
HERBS: Chrysogonum virginianum var. australe, Polygonatum biflorum, Iris cristata, Geranium maculatum, Cimicifuga racemosa, Smilacina racemosa, Cynoglossum virginianum, Uvularia perfoliata, Smilax herbacea, Collinsonia canadensis, Sanguinaria canadensis, Thaspium barbinode, Ligusticum canadense, Aster georgianus, A. phlogifolius, Podophyllum peltatum, Smilax spp., Aristolochia serpentaria, Mitchella repens, Tipularia discolor, Viola spp., Elephantopus tomentosus, Silene virginica, Euphorbia corollata, Hieracium venosum, Aureolaria virginica, Galium spp., Uniola latifolia, Chimaphila maculata, Lobelia cardinalis, Allium canadense, Phlox nivalis, Cocculus carolina, Scutellaria elliptica, Goodyera pubescens, Heuchera americana, Thalictrum thalictroides, Hepatica americana, Commelina communis, Boehmeria cylindrica, Impatiens capensis, Prenanthes altissima, Silphium dentatum, Desmodium rotundifolium, Lilium michauxii, Coreopsis major.
FERNS: Asplenium platyneuron, Botrychium virginianum, Thelypteris noveboracensis, Pteridium aquilinum, Polystichum acrostichoides.

ANIMAL SPECIES LIST:

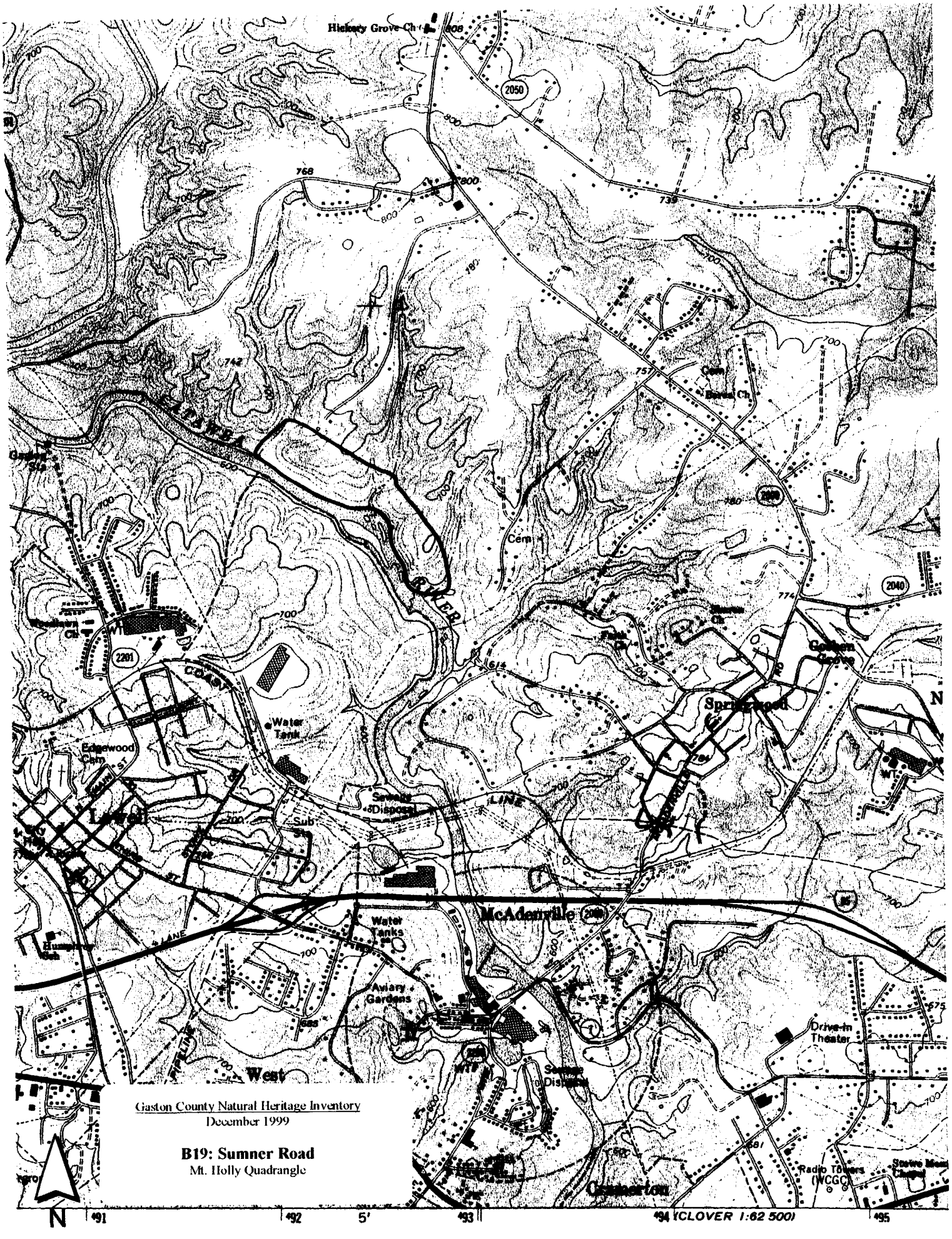
DATE: 19-May-97 **UPDATES:** 13- Aug-1997

OWNER NAME: Private

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Gaston County Natural Heritage Inventory
December 1999

B18: Thornburg Shoals Granitic Flatrock, Bottomland Forest
Gastonia North Quadrangle


Hickory Grove Ch
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Springwood
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Edgewood Cem
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McAdenville
Water Tanks
Aviary & Gardens
Drive-In Theater
West
Sewage Disposal
Radio Towers (WCGC)
Cramerton
Gaston County Natural Heritage Inventory
December 1999
B19: Sumner Road
Mt. Holly Quadrangle
N
491
492
5'
493
494 (CLOVER 1:62 500)
495

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B20 **NAME OF SITE:** Grant Hill

Size: 12 acres **Quadrangle:** Bessemer City
Province: PIEDMONT **Watershed:** Long Creek

Site Significance:
COUNYT (Species diversity. Good integrity.)

Special Status Species (attach EORs): Magnolia macrophylla, up to 14" dbh
Potential for other Special Status Species:
Other noteworthy species or features present: Magnolia macrophylla

PHYSICAL DESCRIPTION
NE facing slope above Long Creek.

Locations and Directions:
West of Besstown Rd at Long Creek.

Landscape Description:
Aspect: N, E **Slope:** 5-35 degrees **Elevation (ft above MSL):** 768-840
Topographic Position: Crest to Lower Slope
Hydrology: Terrestrial **Moisture:** Mesic and Dry Mesic
Geology: Mcs - Muscovite - biotite granite
Soils: TaE, TaD
Comments on Physical Description:

BIOLOGICAL DESCRIPTION
A. Mesic Mixed Hardwood Forest, Piedmont subtype, Dry Mesic Oak-Hickory Forest.
B. The canopy, subcanopy, shrub and herb layers are well developed.
C. The canopy is dominated by Liriodendron tulipifera, Quercus rubra and Acer rubrum.
Subcanopy contains Liquidambar styraciflua, Magnolia macrophylla, Cornus florida, Asimina triloba and Symplocos tinctoria. The Magnolia macrophylla population may contain the largest individual specimen in the county.
Shrubs include Kalmia latifolia, Corylus americana, Rhododendron nudiflorum, Hamamelis virginiana and Euonymus americana.
Herbs present are Hexastylis minor, Chamaelirium luteum, Trillium catesbaei, Sanguinaria canadensis, Medeola virginiana, Viola spp.
Ferns present are Polystichum acrostichoides and Botrychium virginianum.
D. The site is crescent-shaped, facing NE above the floodplain of Long Creek. Adjacent land is used for pasture and residential. The Mesic Mixed Hardwood Forest grades into a Dry-Mesic Oak-Hickory Forest on top of the slope.
E. This area may have been opened up by "Hugo" in 1989, allowing extensive reproduction of the Magnolias in the light gaps. Otherwise the integrity of the area is good.
F. Ca. 12 acres.

Site Integrity: Good **Fire regime:**
Maximum DBH of canopy trees: 28" **Average DBH of canopy trees:** 18"
Logged (y/n): No **Stream channelized (y/n):** No
Even-aged canopy (y/n): No **Dredging/filling (y/n):** No
Non-native / weedy species present (y/n): No **Understory cleared (y/n):** No
Ditched/drained (y/n): Yes **Grazing (y/n):** No
Comments on Biological Description:

ADJACENT LAND USE: Pastures, Residential

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B20 **NAME OF SITE:** Grant Hill

PROTECTION / MANAGEMENT NEEDS:

DOCUMENTATION:

PLANT SPECIES LIST:

CANOPY: Liriodendron tulipifera, Carya tomentosa, Quercus rubra, Q. alba, Q. coccinea, Q. prinus, Acer rubrum, Pinus echinata.
SUBCANOPY: Magnolia macrophylla, Liquidambar styraciflua, Asimina triloba, Prunus serotina, Oxydendrum arboreum, Cornus florida,
SHRUBS: Corylus americana, C. cornuta, Sassafras albidum, Cercis canadensis, Nyssa sylvatica, Amelanchier spp., Euonymus americana, Kalmia latifolia, Rhododendron nudiflorum, Chionanthus virginicus, Hamamelis virginiana, Symplocos tinctoria.
VINES: Dioscorea villosa, Vitis rotundifolia, Parthenocissus quinquefolia.
HERBS: Specularia perfoliata, Podophyllum peltatum, Oenothera spp., Galium spp., Cimicifuga racemosa, Galax aphylla, Chamaelirium luteum, Amianthium muscaetoxicum, Arisaema triphyllum, Trillium catesbaei, Peltandra virginica, Sanguinaria canadensis, Polygonatum biflorum, Chimaphila maculata, Smilacina racemosa, Uvularia perfoliata, Medeola virginiana, Hexastylis minor, Goodyera pubescens, Viola spp., Smilax ecirrhata.
FERNS: Polystichum acrostichoides, Thelypteris hexagonoptera, T. noveboracensis, Adiantum pedatum, Botrychium virginianum, Athyrium asplenioides, Dennstaedtia punctulobula, Woodwardia areolata, Lycopodium lucidulum.

ANIMAL SPECIES LIST:

DATE: 28-May-97 **UPDATES:**

OWNER NAME: Private

Gaston County Natural Heritage Inventory
December 1999

B20: Grant Hill
Bessemer City Quadrangle

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B21 **NAME OF SITE:** Kenneth Oates Farm Forest (Area A)

Size: 43 acres **Quadrangle:** Kings Mtn.
Province: PIEDMONT **Watershed:** Crowders Creek

Site Significance:
COUNTY (Combines with other two areas for diversity.)

Special Status Species (attach EORs):

Potential for other Special Status Species:

Other noteworthy species or features present: Aletris farinosa - along pipeline ROW

PHYSICAL DESCRIPTION

For North facing slope, N, NE, NW facing slopes.

Locations and Directions:

From Gastonia, take 321 S to SR 1103 (Crowders Creek Rd). Turn Right and continue to SR 1112 (Lewis Rd). Continue to Sparrow Springs Rd (still SR 1112) and turn Left. Cross the creek. Mr. Oates' property is on the Right.

Landscape Description:

Aspect: N **Slope:** 0-5-10-35 **Elevation (ft above MSL):** 780-840

Topographic Position: Upper/Mid/Lower Slopes

Hydrology: Terrestrial, Palustrine **Moisture:** Seasonally Wet, Mesic

Geology: (Zbt) Battleground Formation. Quartz-sericite schist with metavolcanic rock, quartz-pebble metaconglomerate, kyanite-sillimanite quarzite and garnet-quartz rock

Soils: TaE-Tatum gravelly loam, 15-25% slopes; TaD-Tatum gravelly loam 8-15% slopes; TaB-Tatum gravelly lo 8% slopes

Comments on Physical Description:

Fairly even-aged canopy with very limited subcanopy.

BIOLOGICAL DESCRIPTION

A. Dry Mesic Oak-Hickory Forest.
B. Canopy is dominated by Quercus alba, Q. coccinea, Q. falcata and Pinus spp.
The subcanopy includes Oxydendrum arboreum, Acer rubrum, Nyssa sylvatica, Cornus florida, Carya spp.
The shrub layer includes Vaccinium stamineum, Rhododendron nudiflorum, Kalmia latifolia, Magnolia tripetela and Quercus marilandica.
Dominant vines are Vitis rotundifolia and Toxicodendron radicans.
Herbs are fairly sparse including Coreopsis major, Hexastylis minor, Hieracium venosum, Chimaphila maculata, Aster spp. Along the treeline adjacent to a pipeline ROW we found Aletris farinosa.
C. The canopy was predominantly Quercus spp. with very few Carya spp.
D. This site appears to be located in the topographic moisture gradient between Dry Oak-Hickory Forest and Mesic Mixed Hardwoods (Piedmont Subtype).
E. The quality of this site is fair.
F. Ca. 43 acres.

Site Integrity: Good **Fire regime:**

Maximum DBH of canopy trees: 20" **Average DBH of canopy trees:** 10"

Logged (y/n): No **Stream channelized (y/n):** No

Even-aged canopy (y/n): Yes **Dredging/filling (y/n):** No

Non-native / weedy species present (y/n): No **Understory cleared (y/n):** No

Ditched/drained (y/n): No **Grazing (y/n):** No

Comments on Biological Description:

ADJACENT LAND USE: Dairy Farm, Residential Housing

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B21 **NAME OF SITE:** Kenneth Oates Farm Forest (Area A)

PROTECTION / MANAGEMENT NEEDS:

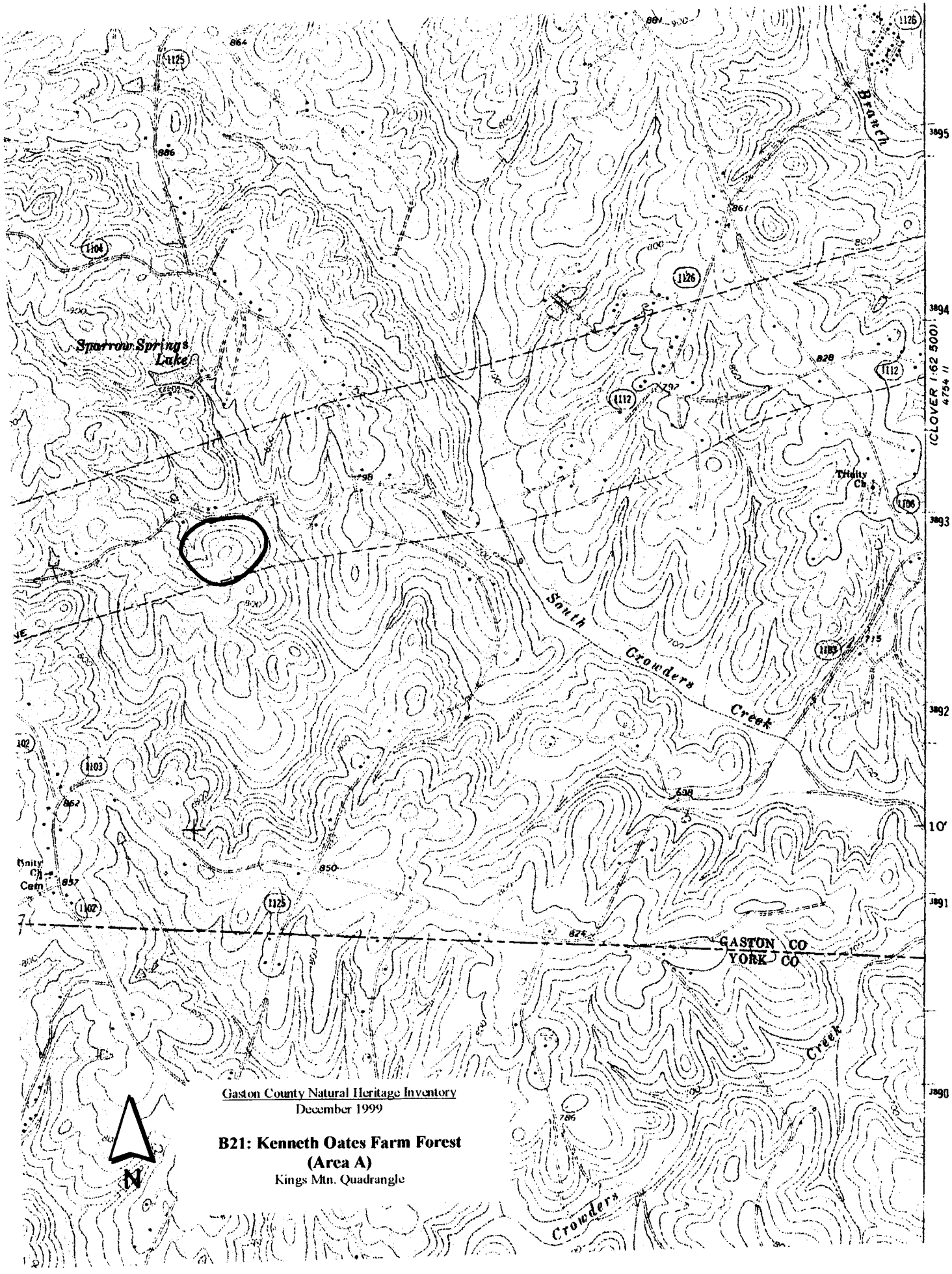
DOCUMENTATION:
UNCC

PLANT SPECIES LIST:
CANOPY: Quercus coccinea, Pinus echinata, Q. falcata, Q. alba, Pinus virginiana.
SUBCANOPY: Oxydendrum arboreum, Acer rubrum, Nyssa sylvatica, Cornus florida, Carya tomentosa.
SHRUBS: Rhododendron nudiflorum, Vaccinium staminium, Ilex opaca, Magnolia tripetala, Ceanothus americanus, Kalmia latifolia, Symplocos tinctoria, Rhus copallina, Amelanchier spp., Vaccinium spp., Castanea dentata.
VINES: Smilax spp., Toxicodendron radicans, Vitis rotundifolia.
HERBS: Silphium compositum, Solidago odorata, Coreopsis major, Salvia lyrata, Hexastylis minor, Hieracium venosum, Chimaphila maculata, Smilax ecirrhata, Aster spp., Liatris spp., Aletris farinosa.
FERNS: Pteridium aquilinum.

ANIMAL SPECIES LIST:

DATE: 04-Jun-97 **UPDATES:**

OWNER NAME: Private



Gaston County Natural Heritage Inventory
December 1999

B21: Kenneth Oates Farm Forest
(Area A)
Kings Mtn. Quadrangle

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B22 **NAME OF SITE:** Kenneth Oates Farm Forest (Area C)

Size: 58 acres **Quadrangle:** Kings Mtn.
Province: PIEDMONT **Watershed:** Crowders Creek

Site Significance:
COUNTY

Special Status Species (attach EORs):

Potential for other Special Status Species:

Other noteworthy species or features present: Trillium cernuum, Cornus alternifolia

PHYSICAL DESCRIPTION

"The Point"

Locations and Directions:

From Gastonia, take 321 S to SR 1103 (Crowders Creek Rd). Turn Right and continue to SR 1112 (Lewis Rd). Continue to Sparrow Springs Rd. (still SR 1112) and turn Left. Cross the creek. Mr. Oates' property is on the Right.

Landscape Description:

Aspect: N, E, W **Slope:** 0-5-10-35 **Elevation (ft above MSL):** 700-740

Topographic Position: Upper/Mid/Lower Slopes, Alluvial Flat

Hydrology: Terrestrial, Palustrine **Moisture:** Seasonally Wet, Mesic

Geology: (Zbt) Battleground Formation. Quartz-sericite schist with metavolcanic rock, quartz-pebble metaconglomerate, kyanite-sillimanite quartzites

Soils: TaE-Tatum gravelly loam, 15-25% slopes; TaB-Tatum gravelly loam, 8-25% slopes; LgB-Lignum silt loam 6%slopes; CH-Chewacla loam frequently flooded

Comments on Physical Description:

Rich sloped; very little weedy spp.

BIOLOGICAL DESCRIPTION

A. Basic Mesic Forest (Piedmont subtype) (Schafale, M.P. and A.S. Weakley, 1990).
B. The canopy is dominated by Quercus rubra, Quercus michauxii, Carya tomentosa and Liriodendron tulipifera. Evidence of logging and other disturbances is suggested through the presence of Fagus grandifolia in the subcanopy and Pinus species in the canopy. Subcanopy consists of Acer rubrum, Magnolia tripetela, Cornus florida, Oxydendrum arboreum and Carpinus caroliniana. The shrub layer includes several species characteristic of the Basic Mesic Forest (Piedmont subtype). Cercis canadensis, Ilex opaca, Hydrangea arborescens, Euonymus spp., Lindera benzoin, Xanthorhiza simplicissima and Asimina triloba are some of these species and suggest the presence of moist soils. The herbaceous layer consists of Trillium catesbaei, T. cernuum, Iris cristata, Podophyllum peltatum, Arisaema triphyllum and Sanguinaria canadensis. Many of these species are characteristic of North facing moist slopes. Ferns growing on the slope included Thelypteris hexagonoptera, Onoclea sensibilis, Athyrium thelypterioides and several other species. These ferns are also indicative of moist slopes.
C. Some notable species include Cornus alternifolia and Athyrium thelypterioides, which are more prevalent in the mountains. Trillium cernuum is commonly found on basic or circumneutral soils.
D. This site is directly North of Ken Oates house and barns. The upper portion of the slope is near his manure storage facilities. Grades into a Basic Mesic Forest, which may account for the abundance of species associated with basic soil types.
E. This site has a relatively diverse species composition compared to other sites we visited. Past logging ventures and the proximity of the site to farming activities decreases its preservation value.
F. The approximate size is ca. 58 acres.

Site Integrity: Fair **Fire regime:**

Maximum DBH of canopy trees: 30" **Average DBH of canopy trees:** 12"

Logged (y/n): Yes **Stream channelized (y/n):** No

Even-aged canopy (y/n): No **Dredging/filling (y/n):** No

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B22 **NAME OF SITE:** Kenneth Oates Farm Forest (Area C)

Non-native / weedy species present (y/n): No **Understory cleared (y/n):** No

Ditched/drained (y/n): No **Grazing (y/n):** No

Comments on Biological Description:

Some areas timbered, not affecting slopes.

ADJACENT LAND USE: Dairy Farm, Residential Housing

PROTECTION / MANAGEMENT NEEDS:

DOCUMENTATION:

UNCC

PLANT SPECIES LIST:

CANOPY: Quercus alba, Q. rubra, Liriodendron tulipifera, Pinus echinata, P. virginiana, Nyssa sylvatica, Carya tomentosa, Q. michauxii, Liquidambar styraciflua.

SUBCANOPY: Fagus grandifolia, Carpinus caroliniana, Magnolia tripetela, Oxydendrum arboreum, Cornus florida, Acer rubrum, Juniperus virginiana.

SHRUBS: Nyssa sylvatica, Xanthorhiza simplicissima, Ulmus rubra, Euonymus americanus, Ilex opaca, Sambucus canadensis, Cornus alternifolia, Styrax grandifolia, Sassafras albidum, Morus rubra, Cercis canadensis, Fraxinus pennsylvanica, Acer rubrum, Corylus americana, Ilex decidua, Kalmia latifolia, Castanea dentata, Arundinaria gigantea, Cornus amomum, Asimina triloba, Rhododendron nudiflorum.

VINES: Dioscorea villosa, Vitis rotundifolia, Parthenocissus quinquefolia, Smilax spp., Toxicodendron radicans, Campsis radicans.

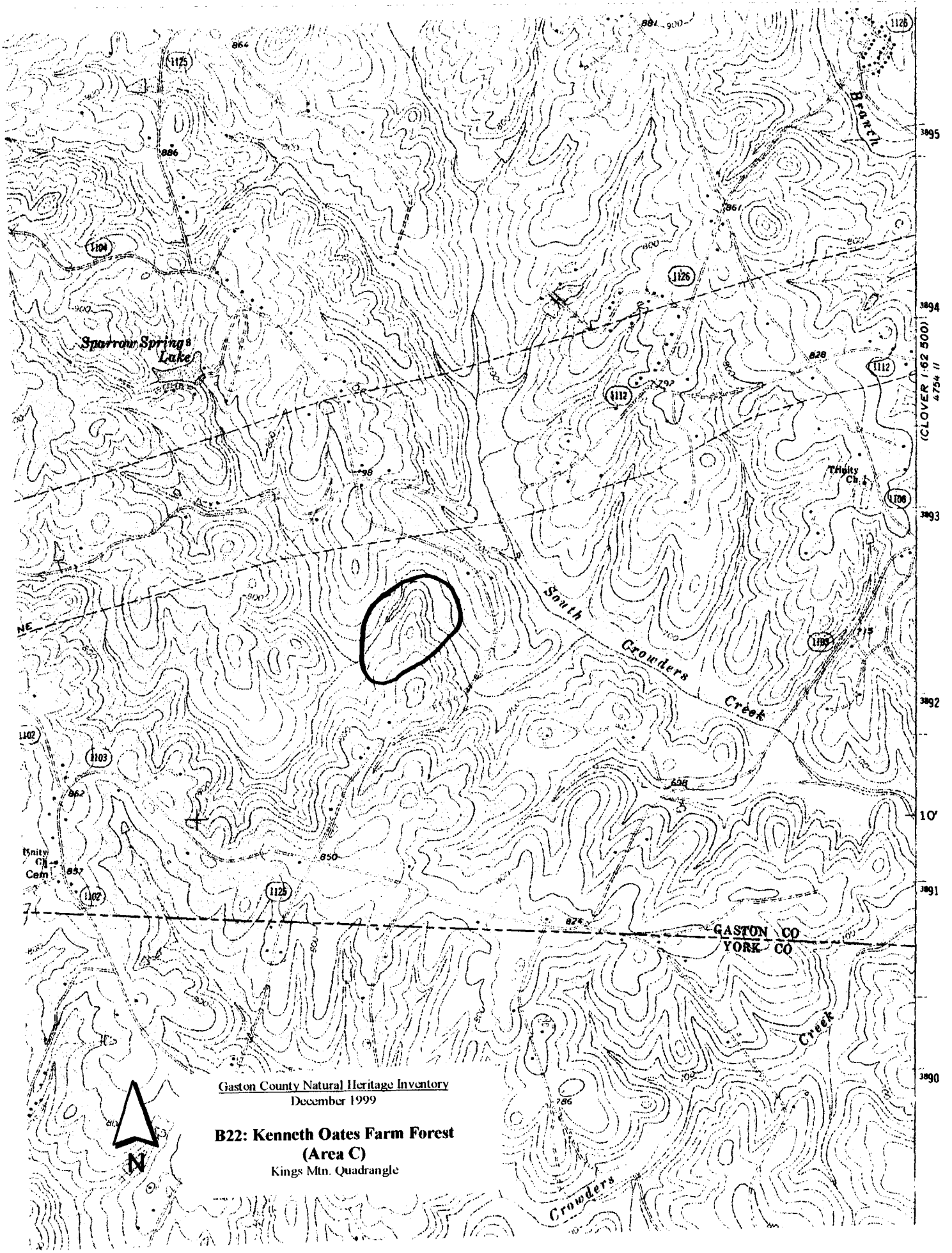
HERBS: Sanguinaria canadensis, Podophyllum peltatum, Hydrangea arborescens, Polygonatum biflorum, Trillium catesbaei, Mitchella repens, Chimaphila maculata, Prenanthes serpentaria, Arisaema triphyllum, Uvularia perfoliata, Goodyera pubescens, Amianthium muscaetoxicum, Aureolaria virginica, Eupatorium spp., Chamaelirium luteum, Smilacina racemosa, Desmodium spp., Cimicifuga racemosa, Aristolochia serpentaria, Collinsonia canadensis, Salvia lyrata, Iris cristata, Trillium cernuum, Ligusticum canadense, Geranium maculatum, Viburnum prunifolium, Sanicula canadensis, Houstonia spp., Epifagus virginiana, Hexastylis minor, Galium spp., Tipularia discolor, Cynoglossum virginianum.

FERNS: Polystichum, acrostichoides, Botrychium virginianum, Thelypteris hexagonoptera, Adiantum pedatum, Asplenium platyneuron, Athyrium asplenioides, Thelypteris noveboracensis, Onoclea sensibilis.

ANIMAL SPECIES LIST:

DATE: 03-Jun-97 **UPDATES:**

OWNER NAME: Private



Gaston County Natural Heritage Inventory
December 1999

B22: Kenneth Oates Farm Forest
(Area C)
Kings Mtn. Quadrangle

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B23 **NAME OF SITE:** Jack Moore Forest

Size: 52 acres **Quadrangle:** Gastonia North
Province: PIEDMONT **Watershed:** Hoyle Creek

Site Significance:
COUNTY (May be Michaux's original Magnolia macrophylla site per Charlie Williams, Castanea 64:1-13, 1999.)

Special Status Species (attach EORs): Magnolia macrophylla

Potential for other Special Status Species:

Other noteworthy species or features present:

PHYSICAL DESCRIPTION

Locations and Directions:

From Dallas, take 275 E (Dallas-Stanley Hwy) to SR 1827. Continue North to Moore Rd. Gravel road on the Left. Continue 0.4 miles to a gate (Left). Enter. Drive across field to treeline. Walk South until you reach slope leading to drainage area.

Landscape Description: Drainage area of Hoyle Creek, surrounded by N, S, W facing slopes.

Aspect: N, S, W **Slope:** 0-5-10-35 **Elevation (ft above MSL):** 660-700

Topographic Position: Upper/Mid/Lower Slopes

Hydrology: Terrestrial, Palustrine **Moisture:** Seasonally Wet, Mesic

Geology: PPMG, Mostly foliated granitic rock (Pennsylvanian to Permian, 270-230my), meta crystic to equigranular. High Shoals Granite

Soils: PaE-Pacolet sandy loam, 15-25% slopes; MaE-Madison sandy loam, 15-25% slopes; MaD2-Madison sandy loam, 8-15% slopes, eroded

Comments on Physical Description:

This site has rather steep rocky slopes on either side of Hoyle Creek.

BIOLOGICAL DESCRIPTION

A. Mesic Mixed Hardwood Forest.
B. Magnolia macrophylla approaches canopy size here along with Quercus alba, Q. rubra, Fagus grandifolia and Liriodendron tulipifera.
Typical subcanopy species include Acer rubrum, Ilex opaca, Oxydendrum arboreum, Cornus florida, Castanea dentata. Shrubs include Viburnum prunifolium, Euonymus americanus, Rhododendron nudiflorum, Corylus cornuta and Kalmia latifolia.
The herb layer ranged from moderately dense to dense, including Monotropa uniflora, Hexastylis minor, Silene virginiana, Chamaelirium luteum, Scutellaria elliptica, Ligusticum canadense, Lilium michauxii, Polygonatum biflorum, Smilacina racemosa, Goodyera pubescens, Trillium catesbaei, Thalictrum thalictroides and Aureolaria spp.
Many fern species were noted, including Polystichum acrostichoides, Thelypteris hexagonoptera, Adiantum pedatum, Osmunda cinnamomea and Athyrium asplenioides.
C. In small, scattered areas Magnolia macrophylla approached canopy size.
D. This site contains steep, rocky slopes (N, S, & W facing) on either side of Hoyle Creek. At the base of the slopes, containing drainage areas, grades into a Piedmont/Low Mtn. Alluvial Forest. Upland, grades into a Dry-Mesic Oak-Hickory Forest.
E. The quality of this is fair.
F. Ca. 52 acres.

Site Integrity: Good **Fire regime:**

Maximum DBH of canopy trees: 22" **Average DBH of canopy trees:** 10"

Logged (y/n): No **Stream channelized (y/n):** No

Even-aged canopy (y/n): No **Dredging/filling (y/n):** No

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B23 **NAME OF SITE:** Jack Moore Forest

Non-native / weedy species present (y/n): No **Understory cleared (y/n):** No

Ditched/drained (y/n): No **Grazing (y/n):** No

Comments on Biological Description:

ADJACENT LAND USE: Agriculture, Residential

PROTECTION / MANAGEMENT NEEDS:

DOCUMENTATION:
UNCC Herbarium. Topo map attached.

PLANT SPECIES LIST:
CANOPY: Liriodendron tulipifera, Quercus alba, Liquidambar styraciflua, Q. rubra, Fagus grandifolia.
SUBCANOPY: Magnolia macrophylla, Prunus serotina, Acer rubrum, Carpinus caroliniana, Ilex opaca, Oxydendrum arboreum, Cornus florida, Fagus grandifolia, Tilia heterophylla.
SHRUBS: Rhododendron nudiflorum, Corylus cornuta, Castanea dentata, Sambucus canadensis, Ilex ambigua, Hamamelis virginica, Kalmia latifolia, Aesculus sylvatica, Corylus americana, Viburnum prunifolium, Euonymus americanus, Arundinaria gigantea.
VINES: Dioscorea villosa, Vitis rotundifolia, Toxicodendron radicans.
HERBS: Geranium maculatum, Podophyllum peltatum, Monotropa uniflora, Hexastylis minor, Silene virginiana, Chamaelirium luteum, Scuttelaria elliptica, Smilacina racemosa, Sanguinaria canadensis, Medeola virginiana, Collinsonia canadensis, Mitchella repens, Ligusticum canadense, Lilium michauxii, Cimicifuga racemosa, Polygonatum biflorum, Goodyera pubescens, Uvularia perfoliata, Hepatica americana, Amianthium muscaetoxicum, Trillium catesbaei, Aristolochia serpentaria, Aureolaria spp., Impatiens capensis, Thalictrum thalictroides, Aruncus dioicus.
FERNS: Polystichum acrostichoides, Thelypteris hexagonoptera, Botrychium virginianum, Asplenium platyneuron, Polypodium polypodioides, Adiantum pedatum, Osmunda cinnamomea, Athyrium asplenioides, Lycopodium flabelliforme.

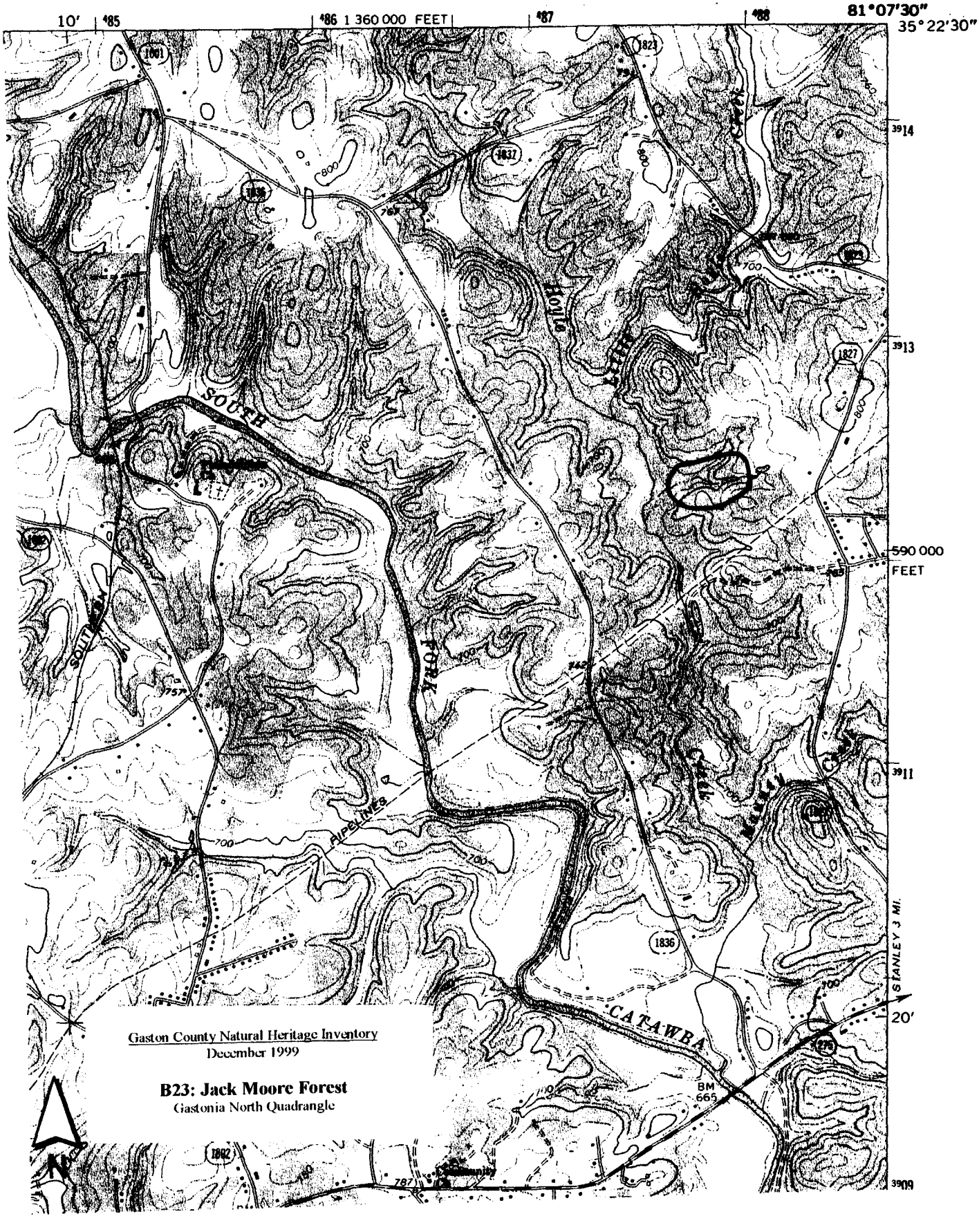
ANIMAL SPECIES LIST:

DATE: 16-Jun-97 **UPDATES:**

OWNER NAME: Private

GASTONIA NORTH QUADRANGLE
NORTH CAROLINA–GASTON CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
SW/4 GASTONIA 15' QUADRANGLE

4784 I NE (LOWESVILLE)



SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B24 **NAME OF SITE:** Falston Road

Size: 40 acres **Quadrangle:** Cherryville
Province: PIEDMONT **Watershed:** Above Reservoir

Site Significance:
COUNTY

Special Status Species (attach EORs):

Potential for other Special Status Species:

Other noteworthy species or features present: Asimina parviflora, Trautvetteria carolinensis, Lilium michauxii

PHYSICAL DESCRIPTION

Locations and Directions:

From Gastonia, take 274 W to SR 1650. Turn Left. Continue (ca.1.4 miles) then fork R. onto SR 1648. Continue to SR 1649 and turn R. Travel (ca. 500 map ft.) then turn Left onto SR 1648. Continue (ca. 0.4 miles). The site is (ca.1000 ft.) West of the road.

Landscape Description:

Aspect: N **Slope:** 0-5-10-35 degrees **Elevation (ft above MSL):** 880-960

Topographic Position: Upper/Mid/Lower Slopes, Alluvial Flat

Hydrology: Terrestrial, Palustrine **Moisture:** Seasonally Wet, Wet Mesic

Geology: CZbg-Biotite gneiss and schist (contains small masses of granite rock) CZms-Mica schist (garnet, kyanite, staurolite and sillimanite occur locally)

Soils: CeD2-Cecil sandy clay loam, 8-15% slopes, eroded; PaE-Pacolet sandy loam, 15-25% slopes; CeB2-Cecil s clay loam, 2-8% slopes, eroded

Comments on Physical Description:

Creek drainage runs through the center of the site. Much of the Eastern portion of the site has been clear cut and pines are dominant.

BIOLOGICAL DESCRIPTION

A. Mesic Mixed Hardwood Forest.
B. Quercus falcata, Quercus stellata and Quercus alba are scattered throughout the canopy.
The subcanopy is comprised primarily of Acer rubrum, Quercus phellos, Betula nigra, Oxydendrum arboreum and Fraxinus pennsylvanica. These species are tolerant to high moisture levels.
The shrub layer includes Asimina parviflora, Itea virginica, Corylus cornuta, Castanea pumila and Alnus serrulata.
The canopy and shrub layers species composition suggests that the creek running through the site frequently floods.
Trautvetteria carolinensis, Lilium michauxii, Arisaema triphyllum and Clematis ochroleuca are some species worth mentioning in the herbaceous layer.
Onoclea sensibilis and Woodwardia areolata are some of the less common ferns and were scattered in wet areas.
C. Liriodendron tulipifera dominated the canopy of the less disturbed area. Upland possibly graded to a Dry-Mesic Oak-Hickory Forest before being clear cut for agricultural use and development.
E. The overall quality of this site was fair.
F. Approx. 40 acres.

Site Integrity: Fair **Fire regime:**

Maximum DBH of canopy trees: 19" **Average DBH of canopy trees:** 12"

Logged (y/n): No **Stream channelized (y/n):** No

Even-aged canopy (y/n): Yes **Dredging/filling (y/n):** No

Non-native / weedy species present (y/n): Yes **Understory cleared (y/n):** No

Ditched/drained (y/n): No **Grazing (y/n):** No

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B24 **NAME OF SITE:** Falston Road

Comments on Biological Description:

Eastern portion of the site (Dellinger's), Lonicera japonica (non-native).

ADJACENT LAND USE: Residential, Agricultural

PROTECTION / MANAGEMENT NEEDS:

DOCUMENTATION:
UNCC Herbarium.

PLANT SPECIES LIST:
CANOPY: Pinus virginiana, Quercus alba, Q. stellata, Q. falcata, Liriodendron tulipifera.
SUBCANOPY: Oxydendrum arboreum, Q. phellos, Q. velutina, Acer rubrum, Fraxinus pennsylvanica, Cornus florida, Liquidambar styraciflua, Betula nigra, Juniperus virginiana, Nyssa sylvatica, Carya tomentosa, C. glabra.
SHRUBS: Rhododendron nudiflorum, Alnus serrulata, Ilex opaca, Corylus cornuta, Castanea pumila, Morus rubra, Chionanthus virginicus, Viburnum nudum, Sassafras albidum, Cornus amomum, Vaccinium spp., Itea virginica, Prunus serotina, Rhus copallina, Asimina parviflora, Arundinaria gigantea, Xanthorhiza simplicissima, Rubus spp.
VINES: Lonicera japonica, Vitis rotundifolia, Smilax spp., Toxicodendron radicans, Parthenocissus quinquefolia.
HERBS: Arisaema triphyllum, Lactuca spp., Trautvetteria carolinensis, Lilium michauxii.

ANIMAL SPECIES LIST:

DATE: 19-Jun-97 **UPDATES:**

OWNER NAME: Private

Gaston County Natural Heritage Inventory
December 1999

B24: Falston Road
Cherryville Quadrangle

SITE DESCRIPTION: Gaston County Natural Heritage Inventory - 1999

SITE NUMBER: B25 **NAME OF SITE:** Freightliner

Size: NA **Quadrangle:** Mtn. Island Lake
Province: PIEDMONT **Watershed:** Johnson Creek & W Side Catawba

Site Significance:
COUNTY (Helianthus schweinitzii.)

Special Status Species (attach EORs): Helianthus schweinitzii

Potential for other Special Status Species:

Other noteworthy species or features present:

PHYSICAL DESCRIPTION

Locations and Directions:

Travel N from Mt. Holly on NC 273. Just past Freightliner, turn Right on paved road (parallel to chainlink fence). Paved road becomes a gravel road. Go to second powerline ROW, just before the river.

Landscape Description: Powerline ROW paralleling Catawba River. Surrounded by successional woods.

Aspect: NE, SE **Slope:** 5-15 degrees **Elevation (ft above MSL):** 600-650

Topographic Position: Upper Slope

Hydrology: Terrestrial **Moisture:** Dry

Geology: Dogm

Soils: PaE, WeD

Comments on Physical Description:

Cleared powerline ROW.

BIOLOGICAL DESCRIPTION

Site Integrity: Disturbed **Fire regime:**

Maximum DBH of canopy trees: NA **Average DBH of canopy trees:** NA

Logged (y/n): No **Stream channelized (y/n):** No

Even-aged canopy (y/n): No **Dredging/filling (y/n):** No

Non-native / weedy species present (y/n): Yes **Understory cleared (y/n):** Yes

Ditched/drained (y/n): No **Grazing (y/n):** No

Comments on Biological Description:

One group of 170 stems near pole #78, another group of 50 stems at pole #85 as surveyed in Oct. 1996. The site was surveyed again on 30 June 1999 and revealed an herbicide treatment applied to the ROW in the Fall of 1998. The population at pole #78 has been reduced to 14 stems; most are stunted. The population at pole #85 was also damaged as evidenced by smaller than normal and stunted plants. The stem count for this population was 54.

ADJACENT LAND USE:

PROTECTION / MANAGEMENT NEEDS:

DOCUMENTATION:
UNCC Herbarium

PLANT SPECIES LIST:

ANIMAL SPECIES LIST:

DATE: 21-Oct-96 **UPDATES:** 30 June 1999

OWNER NAME: Private

Gaston County Natural Heritage Inventory
December 1999

B25: Freightliner
Mtn. Island Lake Quadrangle

Appendices

Appendix 1 – Conservation Resource Listing

Appendix 2 – Vertebrate Fauna of Gaston County

Appendix 3 – Selected Invertebrate Fauna of Gaston County

Appendix 4 – Rare Fauna of Gaston County

Appendix 5 – Crowders Mountain State Park Flora List

Appendix 6 – Crowders Mountain State Park Rare Plants List

Appendix 7 – Definitions of Local, State and Global Status Ranks

APPENDIX 1. CONSERVATION RESOURCES LISTING

FOR INFORMATION ON:

- The **Federal Endangered Species Act**, including lists of endangered species, habitat conservation planning, Safe Harbor, Partners for Wildlife and other recovery programs:

U.S. Fish and Wildlife Service,
160 Zillicoa St., Suite C
Asheville, NC 28801
(828) 258-2084 voice
(828) 258-5330 fax

U.S. Fish and Wildlife Service
P.O. Box 33096
Raleigh, NC 27606
(919) 856-4786 voice
(919) 856-4837 fax

- **North Carolina Endangered Species Act**, or other state laws pertaining to wildlife (birds, fish, animals):

North Carolina Wildlife Resources Commission
512 N. Salisbury St., Raleigh, NC 27604-1188
(919) 733-7291 or (919) 528-3374

- **North Carolina Plant Protection and Conservation Act**, and other state laws pertaining to rare or endangered species:

Plant Conservation Program
NC Department of Agriculture
Mailing Address: P.O. Box 27647, Raleigh, NC 27611
Street Address: 2 West Edenton St., Raleigh, NC 27601
(919) 733-3610 voice (919) 733-1041 fax
website: http://www.agr.state.nc.us/plantind/plant/conserv/cons.htm

- **The North Carolina Registry of Natural Heritage Areas**, includes lists of endangered, threatened and other rare plants and animals in North Carolina:

NC Natural Heritage Program
DENR – Division of Parks and Recreation
P.O. Box 27687, Raleigh, NC 27699-1615
(919) 715-8697 voice (919) 715-3085 fax
website: http://ils.unc.edu/parkproject/nhp/index.html

- **Conservation easements, land donations and tax reducing incentives for land conservation:**

Conservation Trust for North Carolina
P.O. Box 33333, Raleigh, NC 27636-3333
(919) 828-4199 voice (919) 828-4508 fax
e-mail: ctnc@mindspring.com *website*: sunsite.unc.edu/ctnc

North Carolina Department of Agriculture and Consumer Services
P.O. Box 27647, Raleigh, NC 27611
(919) 733-7125
website: www.agr.state.nc.us

Trust for Public Land, Charlotte Program Office
P.O. Box 11456, Charlotte, NC 28220-1456
(704) 521-9129 voice (704) 521-8157 fax

Catawba Lands Conservancy
105 W. Morehead St., Charlotte, NC 28202
(704) 342-3330 voice (704) 342-3340 fax
e-mail: clands@bellsouth.net

The Nature Conservancy of North Carolina
4011 University Dr., Suite 201, Durham, NC 27707
(919) 403-8558 voice (919) 403-0379

American Farmland Trust, National Office
1200 18th St., NW, Suite 800, Washington, D.C. 20036
(202) 331-7300 voice (202) 659-8339 fax
e-mail: info@farmland.org

Conservation Tax Credit Program
NC DENR
P.O. Box 27687, Raleigh, NC 27699-1615

- **Wetland Mitigation Requirements, Compensatory Mitigation:**

The NC Wetland Restoration Program
P.O. Box 29535, Raleigh, NC 27626-0535
(919) 733-5208 voice (919) 733-5321 fax

NC Department of Environment and Natural Resources
Division of Soil and Water Conservation
Mailing Address: 1614 Mail Service Center, Raleigh, NC 27699-1614
Street Address: 512 N. Salisbury St., Raleigh, NC 27604-1148
(919) 733-2302 voice (919) 715-3559 fax

- **Forest Stewardship Program**, including some cost sharing:

NC State University
Extension Forestry
Box 8003, Raleigh, NC 27695-8003
(919) 515-5574 voice
website: http://www.ces.ncsu.edu/nreos/forest/steward/steward.html

- **The Conservation Fund,** N.C. Office
P.O. Box 271, Chapel Hill, NC 27516
(919) 967-2223 voice (919) 967-9702 fax

- **Preservation North Carolina**
(Historic Preservation Foundation of North Carolina)
P.O. Box 27644, Raleigh, NC 27611-7644
(919) 832-3652 voice

LOCAL AGENCIES, with programs for the conservation and development of natural resources, education, county live resource information, technical assistance and related services.

NC Cooperative Extension, Gaston County Office
Mailing Address: P.O. Box 476, Dallas, NC 28034
Street Address: 1303 Dallas-Cherryville Hwy., Dallas, NC 28034
(704) 922-2119 voice (704) 922-2140 fax
website: http://www/ces/ncsu/edu/gaston/

Gaston Natural Resources Conservation District (formerly Soil and Water Conservation)
1303 Dallas-Cherryville Hwy., Dallas, NC 28034
(704) 922-4181 voice (704) 922-2158 fax

USDA - Natural Resources Conservation Service
1303 Dallas-Cherryville Hwy., Dallas, NC 28034
(704) 922-2159 voice (704) 922-2158 fax

Farm Service Agency
P.O. Box 476, Dallas, NC 28034
(704) 922-3086 voice (704) 922-2981 fax

NC Division of Forest Resources, District 12, Mount Holly
P.O. Box 35, Dallas, NC 28034
(704) 922-0719 voice (704) 923-8728 fax

LOCAL EDUCATIONAL RESOURCES

Gaston County Quality of Natural Resources Commission
P.O. Box 476, Dallas, NC 28034
(704) 922-2119 voice (704) 922-2140 fax

Schiele Museum of Natural History
1500 E. Garrison Blvd., Gastonia, NC 28054-5199
(704) 866-6900 voice (704) 866-6041 fax

Daniel Stowe Botanical Garden
6500 South New Hope Rd., Belmont, NC 28012
(704) 825-4490 voice (704) 825-4492 fax

Crowders Mountain State Park
522 Park Office Lane
Rt. 1, Box 159, Kings Mountain, NC 28086
(704) 853-5375 voice (704) 853-5391 fax
e-mail: crowders@unet.net

OTHER AREA CONSERVATION ORGANIZATIONS

Carolinas Land Conservation Network
UNC Charlotte Urban Institute
9201 University City Blvd., Charlotte, NC 28223-0001
(704) 547-2179 voice (704) 547-3179 fax
e-mail: clcn@email.uncc.edu

NC Sierra Club, Central Piedmont Group
3817 Bonwood Dr., Charlotte, NC 28211
(704) 366-1078 voice (704) 366-8517 fax

NC Wildlife Federation Endowment & Education Fund, Inc.
1814 Lombardy Circle, Charlotte, NC 28203
(704) 332-4003 voice (704) 342-4970 fax

Ducks Unlimited
308 Pine Creek Dr., Charlotte, NC 28270
(704) 845-5101 voice (704) 597-7081 fax

APPENDIX 2. VERTEBRATE FAUNA OF GASTON COUNTY, NORTH CAROLINA

MAMMALS

There are 34 species of mammals that can be expected within appropriate habitat in Gaston County. Nine additional species could potentially be found within the county. See the mammals lists for details. Three species of mammals historically occurred within the county, but have been extirpated from the state. These are the Gray Wolf (*Canis lupis lycam*), American Bison (*Bison bison bison*) and the Panther (or Eastern Cougar) (*Felis concolor couguar*). Three of the mammal species present are not native to North Carolina. They have been introduced into the county. These are the Norway rat (*Rattus norvegicus*), the house mouse (*Mus musculus*) and the black rat (*Rattus rattus*). A description of rare mammal species in the county can be found in the Rare Animal section.

The NC State Museum of Natural Sciences does not have any voucher specimens of mammals from Gaston County in their collections and they have only a single sight record listed for Gaston County in their database (Mary K. Clark, pers. comm.). This sight record is of a groundhog (*Marmota monax*). The NC Wildlife Resources Commission does not keep detailed records of non-game mammals within Gaston County, unless there is an ongoing special project (Jack Mason, pers. comm.). Baseline data is still needed on many species. Bat species, small mammal species, and mammals associated with riparian or aquatic habitats should be a priority for future research projects. Increasing development within the county is rapidly changing the status and distribution of existing mammal populations.

The population of white-tailed deer (*Odocoileus virginianus*) within Gaston County has increased over the past decade due to a lack of natural predators and an increase in the availability of appropriate habitat. Unlike many native mammals, deer are able to thrive in suburban areas after moderate development. According to data collected by the NC Wildlife Resources Commission, a total of 66 deer were legally taken during hunting season in the county during the 1992-93 season. During the 1997-98 season, 230 deer were legally harvested. The number of hunters has declined over these years. In the mid 1970's, white-tailed deer weren't found at Crowders Mountain State Park (Burney, 1974.). Today, deer are regularly sighted within the park (Deidri Sarver, Lead Ranger, pers. comm.). Dr. Richard Rankin is currently researching the history of white-tailed deer in Gaston County for a future publication.

The beaver (*Castor canadensis*) population is also increasing within Gaston County. After having been extirpated, beaver are wide-spread once again throughout most of the state. They have become so common in the Piedmont that they are no longer protected. A depredation permit is not required for removal if they become a pest (Ken. Knight, pers. comm.).

A population of river otter (*Lontra canadensis*) has been documented by the NC Wildlife Resources Commission on Mountain Island Lake (Knight, pers. comm.). They are expanding their range in this area and might be expected along any of the unpolluted large stream tributaries. Otters have been seen along streams on the western bank of Lake Wylie

(Donna Lisenby, pers. comm.). Otters require clean water habitat with a good supply of fish and little disturbance by humans.

Bobcat (*Lynx rufus*) have become scarce within the county in recent years (Jack Moore and Duane Crane, pers. comm.). They still are present however. One was found near a home near Dutchmans Creek, just outside of Mount Holly in 1996 (NCWRC). Staff at Crowders Mountain State Park still occasionally observe them (Sarver, pers. comm.).

According to DeBow et al. 1998, Gaston County was one of the first North Carolina counties in which coyotes (*Canis latrans*) were documented in the early 1980's. Since this time, coyotes have expanded their range into all North Carolina counties and their populations continue to increase. At least two subspecies occur in the state, one of which was introduced (DeBow et al., 1998). The presence of this predator negatively impacts local populations of bobcat, red fox, and gray fox. A statewide study is currently underway to determine the extent of North Carolina coyote hybridization with feral dogs. Skulls from roadkill coyotes from the county should be collected and sent to the NC State Museum for analysis.

Refer to the wildlife habitat association lists in Chapter 4 for details on where to find each mammal species.

Class: Mammalia [1]

MAMMALS Marsupials / Marsupialia * Insectivores / Insectivora Bats / Chiroptera * Rabbits / Lagomorpha		
Family	**Common Name**	**Scientific Name**
Didelphiidae		
	Opossum	*Didelphis virginiana virginiana* Kerr
Soricidae		
	Southeastern Shrew	*Sorex longirostris longirostris* Bachman
	Short-tailed Shrew	*Blarina carolinensis*
	Least Shrew	*Cryptotis parva parva* (Say)
Talpidae		
	Eastern Mole	*Scalopus aquaticus howelli* Jackson
Vespertilionidae		
	Little Brown Myotis[1]	*Myotis lucifugus lucifugus* (LeConte)
*	Northern Myotis[2]	*Myotis septentrionalis* (Trouessart)
*	Silver-haired Bat	*Lasionycteris noctivagans* (LeConte)
*	Eastern Pipistrelle	*Pipistrellus subflavus* (F. Cuvier)
	Big Brown Bat	*Eptesicus fuscus fuscus* (Palisot de Beauvois)
	Red Bat	*Lasiurus borealis borealis* (Muller)
*	Seminole Bat[3]	*Lasiurus seminolus* (Rhoads)
*	Hoary Bat	*Lasiurus cinereus cinereus* (Palisot de Beauvois)
*	Evening Bat	*Nycticeius humeralis humeralis* (Rafinesque)
Leporidae		
	Eastern Cottontail	*Sylvilagus floridanus mallurus* (Thomas)

* Documentation for bat species is poor within most areas of the state, including Gaston County. The presence of these bat species is possible or expected, but they are currently undocumented.

Notes:

1 The little brown myotis is currently listed on the North Carolina Animal Watch List.

2 The northern myotis is listed as potentially occurring in Gaston County on the NC Wildlife Resource Commission Nongame and Endangered Wildlife Program's "Potential Species List." The presence of this species is doubtful but possible. It is currently listed as a Species of Special Concern within North Carolina.

3 The Seminole bat is currently listed on the North Carolina Animal Watch List.

[1] The initial mammals list was compiled from Webster et al. (1985), Lee et al. (1982) and field notes. Nomenclature for mammal lists taken primarily from Lee et al. (1982).

Class: Mammalia[1]

MAMMALS Rodents / Rodentia		
Family	**Common Name**	**Scientific Name**
Sciuridae		
	Eastern Chipmunk	*Tamias striatus striatus* (Linnaeus)
	Woodchuck	*Marmota monax monax* (Linnaeus)
	Gray Squirrel	*Sciurus carolinensis carolinensis* Gmelin
	Southern Flying Squirrel	*Glaucomys volans volans* (Linnaeus)
Castoridae		
	Beaver 1	*Castor canadensis carolinensis* Rhoads
Cricetidae		
	Eastern Harvest Mouse	*Reithrodontomys humulis humulis* (Audubon and Bachman)
	White-footed Mouse	*Peromyscus leucopus leucopus* (Rafinesque)
	Old-field Mouse 2	*Peromyscus polionotus colemani* Schwartz
	Golden Mouse	*Ochrotomys nuttalli aureolus* (Audubon and Bachman)
	Hispid Cotton Rat	*Sigmodon hispidus komareki* Gardner
	Meadow Vole	*Microtus pennsylvanicus pennsylvanicus* (Ord)
	Woodland or Pine Vole	*Microtus pinetorum pinetorum* (LeConte)
	Muskrat	*Ondatra zibethicus zibethicus* (Linnaeus)
Muridae		
	Black Rat[3]	*Rattus rattus* (Linnaeus)
	Norway Rat[3]	*Rattus norvegicus* (Berkenhout)
	House Mouse[3]	*Mus musculus* Linnaeus
Zapodidae		
	Meadow Jumping Mouse [4]	*Zapus hudsonius americanus* (Barton)

Notes:

1 Beaver were extirpated from North Carolina in the late 1800's. They were reestablished within the state during the mid 1900's. They have expanded to fill much of their original range.

2 The old-field mouse is listed as potentially occurring in Gaston County on the NC Wildlife Resource Commission Non-game and Endangered Wildlife Program's "Potential Species List." The presence of this species is hypothetical. It is currently listed as a "Significantly Rare" species on the North Carolina Rare Animal list.

3 These are non-native species that are now ubiquitous throughout most of the state.

4 The meadow jumping mouse is expected but currently undocumented. It is on the North Carolina Animal Watch list.

[1] The initial mammals list was compiled from Webster et al. (1985), Lee et al. (1982) and field notes. Nomenclature for mammal lists taken primarily from Lee et al. (1982).

Class: Mammalia[1]

MAMMALS Carnivores / Carnivora Hoofed Mammals / Artiodactyla		
Family	**Common Name**	**Scientific Name**
Ursidae		
	Black Bear[1]	*Ursus americanus americanus* (Paltas) - **rare transient only**
Procyonidae		
	Raccoon	*Procyon lotor lotor* (Linnaeus)
Mustelidae		
	Long-tailed Weasel[2]	*Mustela frenata noveboracensis* (Emmons)
	Mink	*Mustela vison mink* Peale and Palisot de Beauvois
	Striped Skunk	*Mephitis mephitis elongata* Bangs
	River Otter	*Lontra canadensis lataxina* (Schreber) Wilson and Reeder, 1993.
Canidae		
	Coyote[3]	*Canis latrans* Say
	Gray Wolf[4]	*Canis lupis lycam* Schreber - **extirpated**
	Red Fox	*Vulpes vulpes fulva* (Desmarest)
	Gray Fox	*Urocyon cinereoargentus cinereoargentus* (Schreber)
Felidae		
	Panther[4]	*Felis concolor couguar* Kerr - **extirpated**
	Bobcat	*Lynx rufus rufus* (Schreber)
Cervidae		
	White-tailed Deer	*Odocoileus virginianus virginianus* (Zimmerman)
Bovidae		
	American Bison[4]	*Bison bison bison* (Linnaeus) - **extirpated**

Notes:

1 Transient: extirpated from the county, but may on a very rare occasion wander through this area. The black bear is listed as being "Significantly Rare" on the North Carolina Rare Animal List.

2 The long-tailed weasel is currently listed on the North Carolina Animal Watch List.

3 Coyotes have expanded their range into most North Carolina counties within the last ten years. They have been documented in Gaston County since at least 1982 (Debow et al., 1998).

4 These species were once found in Gaston County and throughout much of North Carolina. They have been extirpated from the state.

[1] The initial mammals list was compiled from Webster et al. (1985), Lee et al. (1982) and field notes. Nomenclature for mammal lists taken primarily from Lee et al. (1982).

BIRDS

More information has been collected about the avifauna of Gaston County than any other group of animals. This is primarily due to the enthusiasm and dedication of an assortment of birders who live, or have lived, within the county. This information shows that natural areas in Gaston County are important, year round, to a great diversity of bird species. Two hundred and twelve bird species have been documented here. Included in this list are two species which were once found throughout the Carolinas, but are now extinct. These are the Carolina Parakeet (*Conuropsis carolinensis*) and the Passenger Pigeon (*Ectopistes migratorius*).

Breeding Birds

Results from breeding bird atlas surveys and other field data show that 92 of the 212 species are breeding birds; birds that have been documented as breeding or that are regularly found within the county during breeding season. Breeding bird species are highlighted in bold on the bird species list. Four documented breeding birds are listed as rare in North Carolina. Details about them can be found in the Rare Animal section.

Some interesting breeding species that have been found in the county, or on the border, include the following:

➢Dickcissel: Individuals have been found during breeding season in the agricultural fields near Cherryville, fairly regularly in recent years (Taylor Piephoff/ Carolina Rare Bird Alert, pers. comm.).

➢Horned lark: A pair was located on a 1997 breeding bird survey (BBS route #63-218) in newly turned dirt fields, just across the line in Lincoln County (Garrett, pers. obs.). A search should be made to find this species during breeding season in bare ground fields, in the agricultural areas of northwestern Gaston County.

➢Osprey: Though, once listed under the Endangered Species Act of 1973, osprey sightings are now fairly common along the Catawba River. A pair of ospreys nested in 1998 on a power line tower, along the Catawba River, at the Riverbend Steam Plant (Don Seriff pers. obs.).

➢Hooded merganser: This duck has been found breeding in wood duck boxes on the Mecklenburg County side of the Catawba River (Pete Hogeboom, pers. comm.). Artificial nest boxes on the Gaston side of the Catawba and along the South Fork River should be checked during breeding season for this duck. Hooded mergansers are a very uncommon breeder in the western Piedmont.

Area sensitive, forest-interior bird species can be found breeding in the few remaining large forest tracts within the county. Many of these bird species are in decline because of the lack of sizable forested tracts available for breeding. (See habitat lists for specifics on area

requirements.) Certain tracts may not be large enough for successful breeding and may in actuality represent population sinks. Increasing the area of forest tracts and eliminating fragmentation, and edge habitat where possible, will help increase the breeding success of these species. This will also help reduce nest parasitism by brown-headed cowbirds and nest predation, which continue to be problems for many of these birds. Forest-interior breeders found in the county include the wood thrush, yellow-billed cuckoo, scarlet tanager, American redstart, red-eyed and yellow-throated vireos, ovenbird, Louisiana waterthrush, northern parula, and prothonotary warbler.

Three common breeding species are not native to Gaston County. They are included on the species list. These are the rock dove or "pigeon" (*Columba livia*), the European starling (*Sturnus vulgaris*), and the house ("English") sparrow (*Passer domesticus*). These birds are often considered to be pest species and since they are not native to this country, they are not protected by law. It is important to note that all native bird species and their nests, eggs, and feathers are protected from collection, disturbance or harm by both state and federal law.

Note: There have been reports of glossy ibis (*Plegadis falcinellus*) during breeding season on the pond at Crowders Mountain State Park (Sarver, pers. comm.). Future sightings of this species should be documented, by photos if possible, and the records should be submitted to the NC State Museum of Natural Sciences and the NC Bird Records Committee.

Wintering Birds

A Christmas Bird Count census, sponsored by the local chapter of the National Audubon Society, has been conducted each winter since 1983. The center of the fifteen mile diameter count circle is the intersection of East Franklin Ave. and Cox Road. The highest total of birds found wintering within the count area on a single Gaston Christmas Bird Count has been 68 species. The cumulative number of species found on all counts is 93. The Southern Lake Norman Christmas Bird Count circle incorporates part of the northeast corner of Gaston County. Additional species found within Gaston County on this count include osprey, common merganser and northern pintail, among others (Taylor Piephoff, pers. comm.). This count's highest total species record is 103. Therefore, if a comprehensive county-wide winter bird survey was performed, a total of over 100 bird species could potentially be found utilizing Gaston County habitats. A complete list of the Gaston County Christmas Bird Count species is included.

Note: Laughing gulls (*Larus atricilla*) were reported on the 1991 (150 individuals) and 1992 (15 individuals) Gaston County Christmas Bird Counts. Gaston County is well out of the normal winter range of this species. Occasionally, individual birds are reported inland during the winter. Future winter sightings of laughing gulls should be well documented, by photos if possible, and the records should be submitted to the NC State Museum of Natural Sciences and the NC Bird Records Committee.

Migrating Birds

Gaston County's forests, fields, and riparian habitat, provide critical stopover sites for migrating birds during both spring and fall migrations. Migrants moving through the county each year include a variety of raptor, shorebird and songbird species.

Many of the bird species migrating through Gaston County each spring and fall, spend the winter in Mexico, the West Indies or Central or South America. These "neotropical migrants" are facing serious population declines due to the loss of breeding, wintering, and migration stopover habitat and other migration hazards, like towers, that now exist. Quality stopover habitat sites are critical to the survival of these bird species. Stopover habitats provide cover for resting and vital food resources needed to help replenish depleted energy reserves.

Beckstrom (1998), has shown that the Catawba River corridor contains stopover habitat used by neotropical migrants during both spring and fall migration. The study documents 54 species of neotropical migrant birds moving along the corridor. Bottomland hardwood habitat was found to be of most importance to these species during migration. Loss of stopover habitat can lead directly to the death of individual migrants. It also results in declines in the nesting success of these birds. A list of neotropical migrant songbird species documented along the Catawba River corridor is included for reference. Preservation of bottomland hardwood and other riparian habitat along the Catawba and South Fork Rivers should be a very high priority in Gaston County.

Shorebird migration has not been well documented within the county, but suitable stopover habitat exists for these species, especially in the northwest corner of the county. Extensive farms with a variety of fields, grasslands, and mudflats should be monitored during spring and fall migration for "grasspipers" and other shorebird species, as well as for migrant sparrows. As a group, grassland species are the fastest declining birds in North America. The Kiser farm, near Cherryville, maintains stopover habitat suitable for a variety of these species. Preservation of open space such as that found around farms like the Kiser farm, should also be a priority for Gaston County.

Bird List[1]
Class: Aves

The following bird species have been documented within Gaston County.
Species listed in bold print are birds that breed within the County.

GAVIIFORMES
GAVIIDAE
Gavia immer Common Loon.

PODICIPEDIFORMES
PODICIPEDIDAE
Podilymbus podiceps Pied-billed Grebe.

PELECANIFORMES
PHALACROCORACIDAE
Phalacrocorax auritus Double-crested Cormorant.

ANHINGIDAE
Anhinga anhinga Anhinga.

CICONIIFORMES
ARDEIDAE
Ardea herodias Great Blue Heron.
Ardea alba Great Egret.
Egretta thula Snowy Egret.
Egretta caerulea Little Blue Heron.
Egretta tricolor Tricolored Heron.
***Butorides virescens* Green Heron.**
Nyctanassa violacea Yellow-crowned Night-Heron.

THRESKIORNITHIDAE
Threskiornithinae
Eudocimus albus White Ibis.
Plegadis falcinellus Glossy Ibis.

CATHARTIDAE
***Coragyps atratus* Black Vulture.**
***Cathartes aura* Turkey Vulture.**

[1] Nomenclature taken from the American Ornithologists' Union Check-list of North American Birds, Seventh edition (1998).

Bird List -continued[1]

ANSERIFORMES
- ANATIDAE
  - Anserinae
    - *Chen caerulescens* Snow Goose.
    - ***Branta canadensis*** **Canada Goose.**
  - Anatinae
    - ***Aix sponsa*** **Wood Duck.**
    - *Anas strepera* Gadwall.
    - *Anas americana* American Wigeon.
    - *Anas rubripes* American Black Duck.
    - ***Anas platyrhynchos*** **Mallard.**
    - *Anas discors* Blue-winged Teal.
    - *Anas clypeata* Northern Shoveler.
    - *Anas acuta* Northern Pintail.
    - *Anas crecca* Green-winged Teal.
    - *Aythya valisineria* Canvasback.
    - *Aythya americana* Redhead.
    - *Aythya collaris* Ring-necked Duck.
    - *Aythya marila* Greater Scaup.
    - *Aythya affinis* Lesser Scaup.
    - *Bucephala albeola* Bufflehead.
    - *Lophodytes cucullatus* Hooded Merganser.
    - *Mergus merganser* Common Merganser.
    - *Mergus serrator* Red-breasted Merganser.
    - *Oxyura jamaicensis* Ruddy Duck.

FALCONIFORMES
- ACCIPITRIDAE
  - Pandioninae
    - ***Pandion haliaetus*** **Osprey.**
  - Accipitrinae
    - *Haliaeetus leucocephalus* Bald Eagle.
    - *Circus cyaneus* Northern Harrier.
    - ***Accipiter striatus*** **Sharp-shinned Hawk.**
    - ***Accipiter cooperii*** **Cooper's Hawk.**
    - ***Buteo lineatus*** **Red-shouldered Hawk.**
    - ***Buteo platypterus*** **Broad-winged Hawk.**
    - ***Buteo jamaicensis*** **Red-tailed Hawk.**
- FALCONIDAE
  - Falconinae
    - ***Falco sparverius sparverius*** **American Kestrel.**
    - *Falco columbarius* Merlin.
    - *Falco peregrinus* Peregrine Falcon.

[1] Nomenclature taken from the American Ornithologists' Union Check-list of North American Birds, Seventh edition (1998).

Bird List -continued[1]

GALLIFORMES
- PHASIANIDAE
  - Meleagridinae
    - ***Meleagris gallopavo*** **Wild Turkey.**
- ODONTOPHORIDAE
  - ***Colinus virginianus*** **Northern Bobwhite.**

GRUIFORMES
- RALLIDAE
  - *Rallus limicola* Virginia Rail.
  - *Fulica americana* American Coot.

CHARADRIIFORMES
- Charadriinae
  - *Pluvialis squatarola* Black-bellied Plover.
  - *Pluvialis dominica* American Golden-Plover.
  - *Charadrius semipalmatus* Semipalmated Plover.
  - ***Charadrius vociferus*** **Killdeer.**
- SCOLOPACIDAE
  - Scolopacinae
    - *Tringa melanoleuca* Greater Yellowlegs.
    - *Tringa flavipes* Lesser Yellowlegs.
    - *Tringa solitaria* Solitary Sandpiper.
    - *Actitis macularia* Spotted Sandpiper.
    - *Limosa fedoa* Marbled Godwit.
    - *Calidris pusilla* Semipalmated Sandpiper.
    - *Calidris mauri* Western Sandpiper.
    - *Calidris minutilla* Least Sandpiper.
    - *Calidris fuscicollis* White-rumped Sandpiper.
    - *Calidris melanotos* Pectoral Sandpiper.
    - *Calidris alpina* Dunlin.
    - *Calidris himantopus* Stilt Sandpiper.
    - *Limnodromus griseus* Short-billed Dowitcher.
    - *Gallinago gallinago* Common Snipe.
    - ***Scolopax minor*** **American Woodcock.**
- LARIDAE
  - Larinae
    - *Larus atricilla* Laughing Gull.
    - *Larus philadelphia* Bonaparte's Gull.
    - *Larus delawarensis* Ring-billed Gull.
    - *Larus argentatus* Herring Gull.
  - Sterninae
    - *Sterna caspia* Caspian Tern.
    - *Chlidonias niger* Black Tern.

[1] Nomenclature taken from the American Ornithologists' Union Check-list of North American Birds, Seventh edition (1998).

Bird List -continued[1]

COLUMBIFORMES
- COLUMBIDAE
  - ***Columba livia*** **Rock Dove.** - introduced.
  - ***Zenaida macroura*** **Mourning Dove.**
  - (*Ectopistes migratorius* Passenger Pigeon.) - EXTINCT.

PSITTACIFORMES
- PSITTACIDAE
  - Arinae
    - (*Conuropsis carolinensis* Carolina Parakeet.) - EXTINCT.

CUCULIFORMES
- CUCULIDAE
  - Coccyzinae
    - ***Coccyzus americanus*** **Yellow-billed Cuckoo.**

STRIGIFORMES
- TYTONIDAE
  - ***Tyto alba*** **Barn Owl.**
- STRIGIDAE
  - ***Otus asio*** **Eastern Screech-Owl.**
  - ***Bubo virginiana*** **Great Horned Owl**
  - ***Strix varia*** **Barred Owl.**

CAPRIMULGIFORMES
- CAPRIMULGIDAE
  - Chordeilinae
    - ***Chordeiles minor*** **Common Nighthawk.**
  - Caprimulginae
    - ***Caprimulgus carolinensis*** **Chuck-will's-widow.**
    - ***Caprimulgus vociferus*** **Whip-poor-will.**

APODIFORMES
- APODIDAE
  - Chaeturinae
    - ***Chaetura pelagica*** **Chimney Swift.**
- TROCHILIDAE
  - Trochilinae
    - ***Archilochus colubris*** **Ruby-throated Hummingbird.**
    - *Selasphorus rufus* Rufous Hummingbird.

CORACIIFORMES
- ALCEDINIDAE
  - Cerylinae
    - ***Ceryle alcyon*** **Belted Kingfisher.**

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[1] Nomenclature taken from the American Ornithologists' Union Check-list of North American Birds, Seventh edition (1998).

Bird List -continued[1]

PICIFORMES
- PICIDAE
  - Picinae
    - ***Melanerpes erythrocephalus*** **Red-headed Woodpecker.**
    - ***Melanerpes carolinus*** **Red-bellied Woodpecker.**
    - *Sphyrapicus varius* Yellow-bellied Sapsucker.
    - ***Picoides pubescens*** **Downy Woodpecker.**
    - ***Picoides villosus*** **Hairy Woodpecker.**
    - ***Colaptes auratus*** **Northern Flicker.**
    - ***Dryocopus pileatus*** **Pileated Woodpecker.**

PASSERIFORMES
- TYRANNIDAE
  - Fluvicolinae
    - *Contopus virens* Eastern Wood-Pewee. - probable breeder.
    - *Empidonax virescens* Acadian Flycatcher. - probable breeder.
    - ***Sayornis phoebe*** **Eastern Phoebe.**
  - Tyranninae
    - ***Myiarchus crinitus*** **Great Crested Flycatcher.**
    - ***Tyrannus tyrannus*** **Eastern Kingbird.**
- LANIIDAE
  - ***Lanius ludovicianus ludovicianus*** **Loggerhead Shrike.**
- VIREONIDAE
  - ***Vireo griseus*** **White-eyed Vireo.**
  - *Vireo flavifrons* Yellow-throated Vireo. - probable breeder.
  - *Vireo solitarius* Blue-headed Vireo.
  - *Vireo gilvus* Warbling Vireo.
  - ***Vireo olivaceus*** **Red-eyed Vireo.**
- CORVIDAE
  - ***Cyanocitta cristata*** **Blue Jay.**
  - ***Corvus brachyrhynchos*** **American Crow.**
  - ***Corvus ossifragus*** **Fish Crow.**
- ALAUDIDAE
  - *Eremophila alpestris* Horned Lark.

[1] Nomenclature taken from the American Ornithologists' Union Check-list of North American Birds, Seventh edition (1998).

Bird List -continued[1]

HIRUNDINIDAE

Hirundininae

Progne subis **Purple Martin.**
Tachycineta bicolor Tree Swallow.
Stelgidopteryx serripennis **Northern Rough-winged Swallow.**
Riparia riparia Bank Swallow.
Petrochelidon pyrrhonota **Cliff Swallow.**
Hirundo rustica **Barn Swallow.**

PARIDAE

Poecile carolinensis **Carolina Chickadee.**
Baeolopus bicolor **Tufted Titmouse.**

SITTIDAE

Sittinae

Sitta canadensis Red-breasted Nuthatch.
Sitta carolinensis **White-breasted Nuthatch.**
Sitta pusilla **Brown-headed Nuthatch.**

CERTHIIDAE

Certhiinae

Certhia americana Brown Creeper.

TROGLODYTIDAE

Thryothorus ludovicianus **Carolina Wren.**
Troglodytes aedon **House Wren.**
Troglodytes troglodytes Winter Wren.
Cistothorus palustris Marsh Wren.

REGULIDAE

Regulus satrapa Golden-crowned Kinglet.
Regulus calendula Ruby-crowned Kinglet.

SYLVIIDAE

Polioptilinae

Polioptila caerulea **Blue-gray Gnatcatcher.**

TURDIDAE

Sialia sialis **Eastern Bluebird.**
Catharus fuscescens Veery.
Catharus minimus Gray-cheeked Thrush.
Catharus ustulatus Swainson's Thrush.
Catharus guttatus Hermit Thrush.
Hylocichla mustelina **Wood Thrush.**
Turdus migratorius **American Robin.**

MIMIDAE

Dumetella carolinensis **Gray Catbird.**
Mimus polyglottos **Northern Mockingbird.**
Toxostoma rufum **Brown Thrasher.**

STURNIDAE

Sturnus vulgaris **European Starling.** - introduced.

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[1] Nomenclature taken from the American Ornithologists' Union Check-list of North American Birds, Seventh edition (1998).

Bird List -continued[1]

MOTACILLIDAE

Anthus rubescens American Pipit.

BOMBYCILLIDAE

***Bombycilla cedrorum* Cedar Waxwing.**

PARULIDAE

Vermivora pinus Blue-winged Warbler.
Vermivora chrysoptera Golden-winged Warbler.
Vermivora peregrina Tennessee Warbler.
Vermivora celata Orange-crowned Warbler.
Vermivora ruficapilla Nashville Warbler.
***Parula americana* Northern Parula.**
***Dendroica petechia* Yellow Warbler.**
Dendroica pensylvanica Chestnut-sided Warbler.
Dendroica magnolia Magnolia Warbler.
Dendroica tigrina Cape May Warbler.
Dendroica caerulescens Black-throated Blue Warbler.
Dendroica coronata Yellow-rumped Warbler.
Dendroica virens Black-throated Green Warbler.
Dendroica fusca Blackburnian Warbler.
***Dendroica dominica* Yellow-throated Warbler.**
***Dendroica pinus* Pine Warbler.**
***Dendroica discolor* Prairie Warbler.**
Dendroica palmarum Palm Warbler.
Dendroica castanea Bay-breasted Warbler.
Dendroica striata Blackpoll Warbler.
Dendroica cerulea Cerulean Warbler.
***Mniotilta varia* Black-and-white Warbler.**
***Setophaga ruticilla* American Redstart.**
***Protonotaria citrea* Prothonotary Warbler.**
Helmitheros vermivorus Worm-eating Warbler.
***Seiurus aurocapillus* Ovenbird.**
Seiurus noveboracensis Northern Waterthrush.
***Seiurus motacilla* Louisiana Waterthrush.**
Oporornis formosus Kentucky Warbler.
Oporornis agilis Connecticut Warbler.
Oporornis philadelphia Mourning Warbler.
***Geothlypis trichas* Common Yellowthroat.**
Wilsonia citrina Hooded Warbler.
Wilsonia canadensis Canada Warbler.
***Icteria virens* Yellow-breasted Chat.**

THRAUPIDAE

***Piranga rubra* Summer Tanager.**
***Piranga olivacea* Scarlet Tanager.**
Piranga ludoviciana Western Tanager.

[1] Nomenclature taken from the American Ornithologists' Union Check-list of North American Birds, Seventh edition (1998).

Bird List -continued[1]

EMBERIZIDAE

Pipilo erythrophthalmus **Eastern Towhee.**
Spizella passerina **Chipping Sparrow.**
Spizella pusilla **Field Sparrow.**
Pooecetes gramineus Vesper Sparrow.
Passerculus sandwichensis Savannah Sparrow.
Ammodramus savannarum **Grasshopper Sparrow.**
Ammodramus henslowii Henslow's Sparrow.
Passerella iliaca Fox Sparrow.
Melospiza melodia **Song Sparrow.**
Melospiza georgiana Swamp Sparrow.
Zonotrichia albicollis White-throated Sparrow.
Zonotrichia leucophrys White-crowned Sparrow.
Junco hyemalis Dark-eyed Junco.

CARDINALIDAE

Cardinalis cardinalis **Northern Cardinal.**
Pheucticus ludovicianus Rose-breasted Grosbeak.
Guiraca caerulea **Blue Grosbeak.**
Passerina cyanea **Indigo Bunting.**
Spiza americana **Dickcissel.**

ICTERIDAE

Dolichonyx oryzivorus Bobolink.
Agelaius phoeniceus **Red-winged Blackbird.**
Sturnella magna **Eastern Meadowlark.**
Euphagus carolinus Rusty Blackbird.
Quiscalus quiscula **Common Grackle.**
Molothrus ater **Brown-headed Cowbird.**
Icterus spurius **Orchard Oriole.**
Icterus galbula Baltimore Oriole.

FRINGILLIDAE

Carduelinae

Carpodacus purpureus Purple Finch.
Carpodacus mexicanus **House Finch.**
Carduelis pinus Pine Siskin.
Carduelis tristis **American Goldfinch.**
Coccothraustes vespertinus Evening Grosbeak.

PASSERIDAE

Passer domesticus **House Sparrow.** - introduced.

[1] Nomenclature taken from the American Ornithologists' Union Check-list of North American Birds, Seventh edition (1998).

Gaston County, NC
Compiled Christmas Bird Count List
1983 - 1997

93 species

Pied-billed Grebe	*Podilymbus podiceps*
Great Blue Heron	*Ardea herodias*
Little Blue Heron	*Egretta caerulea*
Green Heron	*Butorides virescens*
Black Vulture	*Coragyps atratus*
Turkey Vulture	*Cathartes aura*
Snow Goose	*Anser caerulescens*
Canada Goose	*Branta canadensis*
Wood Duck	*Aix sponsa*
Green-winged Teal	*Anas crecca*
American Black Duck	*Anas rubripes*
Mallard	*Anas platyrhynchos*
Gadwall	*Anas strepera*
American Wigeon	*Anas americana*
Ring-necked Duck	*Aythya collaris*
Bufflehead	*Bucephala albeola*
Hooded Merganser	*Lophodytes cucullatus*
Ruddy Duck	*Oxyura jamaicensis*
Northern Harrier	*Circus cyaneus*
Sharp-shinned Hawk	*Accipiter striatus*
Cooper's Hawk	*Accipiter cooperii*
Red-shouldered Hawk	*Buteo lineatus*
Red-tailed Hawk	*Buteo jamaicensis*
American Kestrel	*Falco sparverius*
Merlin	*Falco columbarius*
Northern Bobwhite	*Colinus virginianus*
American Coot	*Fulica americana*
Killdeer	*Charadrius vociferus*
Common Snipe	*Gallinago gallinago*
Laughing Gull	*Larus atricilla*
Ring-billed Gull	*Larus delawarensis*
Rock Dove	*Columba livia*
Mourning Dove	*Zenaida macroura*
Eastern Screech-Owl	*Otus asio*
Great Horned Owl	*Bubo virginianus*
Barred Owl	*Strix varia*
Belted Kingfisher	*Ceryle alcyon*
Red-headed Woodpecker	*Melanerpes erythrocephalus*
Red-bellied Woodpecker	*Melanerpes carolinus*
Yellow-bellied Sapsucker	*Sphyrapicus varius*
Downy Woodpecker	*Picoides pubescens*
Hairy Woodpecker	*Picoides villosus*
Northern Flicker	*Colaptes auratus*
Pileated Woodpecker	*Dryocopus pileatus*
Eastern Phoebe	*Sayornis phoebe*
Loggerhead Shrike	*Lanius ludovicianus*
Solitary Vireo	*Vireo solitarius*
Blue Jay	*Cyanocitta cristata*
American Crow	*Corvus brachyrhynchos*
Carolina Chickadee	*Poecile carolinensis*
Tufted Titmouse	*Baeolopus bicolor*
Red-breasted Nuthatch	*Sitta canadensis*
White-breasted Nuthatch	*Sitta carolinensis*
Brown-headed Nuthatch	*Sitta pusilla*
Brown Creeper	*Certhia americana*
Carolina Wren	*Thryothorus ludovicianus*
House Wren	*Troglodytes aedon*
Winter Wren	*Troglodytes troglodytes*
Golden-crowned Kinglet	*Regulus satrapa*
Ruby-crowned Kinglet	*Regulus calendula*
Eastern Bluebird	*Sialia sialis*
Hermit Thrush	*Catharus guttatus*
American Robin	*Turdus migratorius*
Gray Catbird	*Dumetella carolinensis*
Northern Mockingbird	*Mimus polyglottos*
Brown Thrasher	*Toxostoma rufum*
European Starling	*Sturnus vulgaris*
Cedar Waxwing	*Bombycilla cedrorum*
Yellow-rumped Warbler	*Dendroica coronata*
Pine Warbler	*Dendroica pinus*
Eastern Towhee	*Pipilo erythrophthalmus*
Chipping Sparrow	*Spizella passerina*
Field Sparrow	*Spizella pusilla*
Savannah Sparrow	*Passerculus sandwichensis*
Grasshopper Sparrow	*Ammodramus savannarum*
Fox Sparrow	*Passerella iliaca*
Song Sparrow	*Melospiza melodia*
Swamp Sparrow	*Melospiza georgiana*
White-throated Sparrow	*Zonotrichia albicollis*
White-crowned Sparrow	*Zonotrichia leucophrys*
Dark-eyed Junco	*Junco hyemalis*
Northern Cardinal	*Cardinalis cardinalis*
Red-winged Blackbird	*Agelaius phoeniceus*
Eastern Meadowlark	*Sturnella magna*
Rusty Blackbird	*Euphagus carolinus*
Common Grackle	*Quiscalus quiscula*
Brown-headed Cowbird	*Molothrus ater*
Purple Finch	*Carpodacus purpureus*
House Finch	*Carpodacus mexicanus*
Pine Siskin	*Carduelis pinus*
American Goldfinch	*Carduelis tristis*
Evening Grosbeak	*Coccothraustes vespertinus*
House Sparrow	*Passer domesticus*

(Birds on this list: 93)

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Neotropical Documented Migrants Along the Catawba River Corridor

Species	Status[1]	Species	Status
Osprey *Pandion haliaetus*	SR	Prothonotary Warbler *Protonotaria citrea*	SR
Yellow-billed Cuckoo *Coccyzus americanus*	SR	Ovenbird *Seiurus aurocapillus*	T-formerly SR
Chimney Swift *Chaetura pelagica*	CSR	Worm-eating Warbler	T
Ruby-throated Hummingbird *Archilochus colubris*	CSR	*Helmitheros vermivorus*	
Eastern Wood Pewee *Contopus virens*	CSR	Common Yellowthroat *Geothlypis trichas*	CSR
Acadian Flycatcher *Empidonax virescens*	CSR	Hooded Warbler *Wilsonia citrina*	SR
Eastern Phoebe *Sayornis phoebe*	CPR	Canada Warbler *Wilsonia canadensis*	T
Great Crested Flycatcher *Myiarchus crinitus*	CSR	Yellow-breasted Chat *Icteria virens*	SR
Eastern Kingbird *Tyrannus tyrannus*	CSR	Summer Tanager *Piranga rubra*	RaSR
N. Rough-winged Swallow *Stelgidopteryx ruficollis*	SR	Scarlet Tanager *Piranga olivacea*	T-formerly SR
Barn Swallow *Hirundo rustica*	CT&SR	Rose-breasted Grosbeak	T
Blue-gray Gnatcatcher *Polioptera caerulea*	CSR	*Pheucticus ludovicianus*	
Veery *Catharus fuscescens*	UT	Indigo Bunting *Passerina cyanea*	CSR
Gray-cheekedThrush *Catharus minimus*	UT	Bobolink *Dolichonyx oryzivorus*	UT
Swainson's Thrush *Catharus ustulatus*	ST&FT	Orchard Oriole *Icterus spurius*	SR
Hermit Thrush *Catharus guttatus*	WR&T	Baltimore Oriole *Icterus galbula*	T&UWR
Wood Thrush *Hylocichla mustelina*	CSR		
Gray Catbird *Dumetella carolinensis*	SR		
Blue-headed Vireo *Vireo solitarius*	T&RaWR		
Yellow-throated Vireo *Vireo flavifrons*	USR		
Warbling Vireo *Vireo gilvus*	RaT		
White-eyed Vireo *Vereo griseus*	CSR		
Red-eyed Vireo *Vireo olivaceus*	CSR		
Blue-winged Warbler *Vermivora pinus*	UT		
Tennessee Warbler *Vermivora peregrina*	UT		
Northern Parula *Parula americana*	SR		
Yellow Warbler *Dendroica petechia*	T&RaSR		
Chestnut-sided Warbler *Dendroica pensylvanica*	CT		
Magnolia Warbler *Dendroica magnolia*	CT		
Cape May Warbler *Dendroica tigrina*	CT		
Black-throated Blue Warbler *Dendroica caerulescen*	CT		
Yellow-rumped Warbler *Dendroica coronata*	T&CWR		
Black-throated Green Warbler *Dendroica virens*	T		
Yellow-throated Warbler *Dendroica dominica*	USR		
Prairie Warbler *Dendroica discolor*	SR		
Palm Warbler *Dendroica palmarum*	T&UWR		
Bay-breasted Warbler *Dendroica castanea*	UT		
Blackpoll Warbler *Dendroica striata*	CT		
Cerulean Warbler *Dendroica cerulea*	RaT		
Black-and-white Warbler *Mniotilta varia*	CT-formerly RaSR		
American Redstart *Setophaga ruticilla*	CT-formerly RaSR		

Taken with permission from Beckstrom (1998)

[1] Codes:

	U = uncommon	W = winter
T = transient	C = common	P = permanent
R = resident	S = summer	Ra = rare

REPTILES

Thirty-seven species of reptiles have been documented in Gaston County. This includes nine species of turtles, seven species of lizards and 21 species of snakes. Three additional species are included in the reptile species list as being "expected". These are the northern scarlet snake (*Cemophora coccinea*), eastern ribbon snake (*Thamnophis sauritus*) and the rough earth snake (*Virginia striatula*). Appropriate habitat is available for each of these snakes and Gaston County is within the possible range of these species, but they have yet to be documented from within the county. Two of the turtle species and two of the snake species are considered rare. They are discussed in the Rare Animal section. Refer to the habitat association lists to see the habitats of the common reptiles.

The copperhead (*Agkistrodon contortrix*) is one of three species of venomous snakes in Gaston County. It is the only venomous snake species documented from outside of Crowders Mountain State Park. Two interesting reports of copperheads were provided by Paul Hart, former Park Ranger at Crowders Mountain State Park. These are of a single individual > 50" long, crossing the road near the park superintendent's house and a roadkill female with 21 - 35 young, found within the park.

Cottonmouth water moccasins (*Agkistrodon piscivorous*) have **not** been documented in Gaston County. Reports of this venomous snake from within the county or from along the Catawba River are erroneous. The nonvenomous northern watersnake (N*erodia sipedon*) is often mistaken for this species. *Nerodia sipedon* is often called "water moccasin" but it is not venomous. True cottonmouth water moccasins (*Agkistrodon piscivorous*) do not naturally occur this far west in North Carolina.

One surprising find from Gaston County is the discovery of brown watersnakes (*Nerodia taxispilota*) in the South Fork River. Jim Green of the Schiele Museum discovered a group of four individuals in 1992 and submitted a voucher specimen to the NC State Museum of Natural Sciences.

Snakes are routinely misidentified and unfortunately, many are often killed when encountered. Both venomous and nonvenomous snakes are important components of the county's natural heritage and each plays a vital role in the ecology of the area, as both prey and predator.

Populations of eastern box turtles (*Terrapene carolina*) are in decline throughout the east. This terrestrial turtle is popular as a pet in the U.S and in Europe. Large numbers have been collected from the wild for the pet trade. The box turtle is now listed under the CITES agreement to protect it from further pressures from international trade. Box turtles are also severely impacted from habitat fragmentation and are prone to being killed by automobiles while trying to cross roads. The box turtle is the official "state reptile" of North Carolina. It is not currently listed as a rare animal in North Carolina, but habitats containing box turtle populations should be maintained to help prevent further declines in populations of this species. Box turtles can live to be over 100 years old in the wild (Ernst et al., 1995). Their home ranges are relatively small, often being only 1 ha. in size. Corridors need to be maintained to provide for adequate gene flow so that inbreeding depression doesn't become a problem in isolated populations.

Class: Reptilia[1]

TURTLES Testudines				
Family	**Common Name**	**Scientific Name**	**Record**	**Notes**
Chelydridae				
	Common Snapping Turtle	*Chelydra serpentina serpentina* (Linnaeus)	●	
	Eastern Painted Turtle	*Chrysemys picta picta* (Schneider)	●	
	Bog Turtle	*Clemmys muhlenbergii* (Schoepff)	O	1
	Eastern River Cooter	*Pseudemys concinna concinna* (LeConte)	O	
	Eastern Box Turtle	*Terrapene carolina carolina* (Linnaeus)	O	
	Yellowbelly Slider	*Trachemys scripta scripta* (Schoepff)	●	2
Kinosternidae				
	Eastern Mud Turtle	*Kinosternon subrubrum subrubrum* (Lacepede)	●	
	Common Musk Turtle	*Sternotherus odoratus* (Latreille)	O	
Trionychidae				
	Gulf Coast Spiny Softshell	*Apalone spinifera aspera* (Aggassiz)	●	3

Record:

* Species is expected but is currently undocumented within Gaston County.

O Locality record is accepted as valid but not supported by voucher specimens.

● Locality record is substantiated by voucher specimens.

Notes:

1 The southern population of the bog turtle is currently listed as Threatened within North Carolina and by the USFWS.

2 Gaston County is at the western limit of the known range for yellowbelly slider. A subspecies *Trachemys scripta elegans*, the redear slider, has been found in Gaston County. This turtle is not native but many have been released due to the pet trade.

3 Gulf Coast spiny softshell turtles are currently listed on the North Carolina Animal Watch list.

[1] Locality record information for reptiles is compiled from Palmer and Braswell (1995), from voucher specimens at UNCC, from field notes and from records at Crowders Mountain State Park. Nomenclature is taken from Palmer and Braswell (1995).

Class: Reptilia[1]

LIZARDS Squamata / Lacertilia				
Family	**Common Name**	**Scientific Name**	**Record**	**Notes**
Phrynosomatidae				
	Northern Fence Lizard	*Sceloparus undulatus hyacinthinus* (Green)	●	
Polychrotidae				
	Green Anole	*Anolis carolinensis* (Voigt)	●	
Scincidae				
	Five-lined Skink	*Eumeces fasciatus* (Linnaeus)	●	
	Southeastern Five-lined Skink	*Eumeces inexpectatus* Taylor	●	
	Broadhead Skink	*Eumeces laticeps* (Schneider)	○	1
	Ground Skink	*Scincella lateralis* (Say)	●	
Teiidae				
	Six-lined Racerunner	*Cnemidophorus sexlineatus sexlineatus* (Linnaeus)	●	

Record:

* Species is expected but is currently undocumented within Gaston County.

○ Locality record is accepted as valid but not supported by voucher specimens.

● Locality record is substantiated by voucher specimens.

Notes:

1 Broadhead skinks have been found within Crowders Mountain State Park. A voucher specimen of this species should be collected and submitted to the North Carolina State Museum of Natural Sciences.

[1] Locality record information for reptiles is compiled from Palmer and Braswell (1995), from voucher specimens at UNCC, from field notes and from records at Crowders Mountain State Park. Nomenclature is taken from Palmer and Braswell (1995).

Class: Reptilia[1]

SNAKES Squamata / Serpentes				
Family	**Common Name**	**Scientific Name**	**Record**	**Notes**
Colubridae				
	Eastern Worm Snake	*Carphophis amoenus amoenus* (Say)	●	
	Northern Scarlet Snake	*Cemophora coccinea copei* Jan	*	1
	Northern Black Racer	*Coluber constrictor constrictor* Linnaeus	●	
	Southern Ringneck Snake	*Diadophis punctatus punctatus* (Linnaeus)	●	2
	Northern Ringneck Snake	*Diadophis punctatus edwardsii* (Merrem)	●	2
	Corn Snake	*Elaphe guttata gutttata* (Linnaeus)	○	
	Black Rat Snake	*Elaphe obsoleta obsoleta* (Say)	●	
	Eastern Hognose Snake	*Heterodon platirhinos* Latreille	●	
	Mole Kingsnake	*Lampropeltis calligaster rhombomaculata* (Holbrook)	●	
	Eastern Kingsnake	*Lampropeltis getula getula* (Linnaeus)	●	
	Northern Watersnake	*Nerodia sipedon sipedon* (Linnaeus)	●	
	Brown Watersnake	*Nerodia taxispilota* (Holbrook)	●	3
	Rough Green Snake	*Opheodrys aestivus* (Linnaeus)	●	
	Queen Snake	*Regina septemvittata* (Say)	●	
	Brown Snake	*Storeria dekayi* (Holbrook)	●	
	Northern Redbelly Snake	*Storeria occipitomaculata occipitomaculata* (Storer)	●	
	Southeastern Crowned Snake	*Tantilla coronata* Baird and Girard	●	
	Eastern Ribbon Snake	*Thamnophis sauritus sauritus* (Linnaeus)	*	

[1] Locality record information for reptiles is compiled from Palmer and Braswell (1995), from voucher specimens at UNCC, from field notes and from records at Crowders Mountain State Park. Nomenclature is taken from Palmer and Braswell (1995).

	Eastern Garter Snake	*Thamnophis sirtalis sirtalis* (Linnaeus)	●	
		SNAKES Squamata / Serpentes		
Family	**Common Name**	**Scientific Name**	**Record**	**Notes**
	Rough Earth Snake	*Virginia striatula* (Linnaeus)	*	
	Eastern Earth Snake	*Virginia valeriae valeriae* Baird and Girard	●	
Viperidae				
	Copperhead	*Agkistrodon contortrix contortrix* (Linnaeus) *x mokasen* Paliset de Beauvois	●	
	Timber Rattlesnake	*Crotalus horridus* Linnaeus	●	4
	Carolina Pygmy Rattlesnake	*Sistrurus miliarius miliarius* (Linnaeus)	●	5

Record:

* Species is expected but is currently undocumented within Gaston County.

○ Locality record is accepted as valid but not supported by voucher specimens.

● Locality record is substantiated by voucher specimens.

Notes:

1 Records for Mecklenburg County exist. A search should be made to look for northern scarlet snakes in habitat areas with sandy, porous soils.

2 The status of the two subspecies of Ringneck snake is unclear within Gaston County. A *Diadophis punctatus punctatus x edwardsii* hybrid is documented for the county (Palmer and Braswell, 1995).

3 Collected from the South Fork river in 1992 by Jim Green of the Schiele Museum. This record represents the westernmost record for North Carolina.

4 A disjunct population of Timber rattlesnakes exists in and around Crowders Mountain State Park. Populations of this species are currently declining throughout the state. Timber rattlesnakes are currently listed as "Significantly Rare" on the North Carolina Rare Animal List.

5 Two Pygmy rattlesnakes were documented by Paul Hart at Crowders Mountain State Park (one in 1981 and one in 1984). This species is currently proposed as a Species of Special Concern within North Carolina.

AMPHIBIANS

The status, distribution, and ecology of amphibians in Gaston County generally is less well known than that of the reptiles. Twenty total species, 10 species of salamanders and 10 species of frogs, are documented in the county. Four additional species are listed as possibly occurring here. The first two are uncommon species, the eastern spadefoot toad (*Scaphiopus holbrookii*) and the eastern narrowmouth toad (*Gastrophyrne carolinensis*). Suitable habitat exists for each of these species, but Gaston County is at the western edge of both of their ranges. The two others are rare amphibian species, one salamander and one frog. They are discussed in Chapter 4 - Rare Species section.

Amphibians require moist or wet habitat to breed successfully and survive. Many of these habitats in Gaston County have been severely degraded as a result of industrial effluent, agricultural run-off, and development. Environmental contaminants and siltation continue to be big problems. Preservation and protection of wetland and aquatic habitat within the county should be a very high priority.

In areas where stream quality is still relatively good, two species of salamanders can regularly be found. These are the northern dusky salamander (*Desmognathus fuscus*) and the southern two-lined salamander (*Eurycea cirrigera*). White-spotted (slimy) salamanders (*Plethodon cylindraceus*) are probably the most common terrestrial salamander within the county. The rest of the salamander species are uncommon to occasional.

Two species of mole salamanders have been found in the county. They are the spotted salamander (*Ambystoma maculatum*) and the marbled salamander (*Ambystoma opacum*). Both of these species prefer forested, vernal pool habitats for breeding. Habitat for these salamanders is becoming increasingly rare. Special attempts should be made to find and protect areas with sizable populations of these species in the county. Dr. Mike McLeod of Belmont Abbey College, is planning to conduct a future survey to learn more about the area's salamanders.

Most frog species are still fairly common in wetland or aquatic habitats within Gaston County, but they will decline with the continued loss of wetland habitat to development. They, like the salamanders, will not do well in polluted aquatic habitats. The status and distribution of American toads within the county is unclear. Surveys for breeding calls should be done during the breeding season to document the distribution of the American toad and other frog species. Protocols are available from the Patuxent Wildlife Research Center in Laurel, Maryland. Data from these surveys will provide important information about frog species and wetland habitats within the county. Current data can also be contributed to a national database and analyzed for use by the international "Declining Amphibian Task Force."

Appendix 2. Vertebrate Fauna of Gaston County, North Carolina

Class: Amphibia[1]

SALAMANDERS Caudata				
Family	**Common Name**	**Scientific Name**	**Record**	**Notes**
Salamandridae				
	Red-spotted Newt	*Notophthalmus viridescens viridescens*	●	
Ambystomatidae				
	Spotted Salamander	*Ambystoma maculatum*	●	
	Marbled Salamander	*Ambystoma opacum*	○	
Plethodontidae				
	Northern Dusky Salamander	*Desmognathus fuscus fuscus*	●	
	Southern Two-lined Salamander	*Eurycea cirrigera*	●	
	Three-lined Salamander	*Eurycea longicauda guttolineata*	●	
	Carolina Spring Salamander	*Gyrinophilus porphyriticus dunni*	○	
	Four-toed Salamander	*Hemidactylium scutatum*	*	1
	White-spotted (Slimy) Salamander	*Plethodon cylindraceus*	●	
	Eastern Mud Salamander	*Pseudotriton montanus montanus*	○	
	Northern Red Salamander	*Pseudotriton ruber ruber*	○	

Record:

* = Species is possible but is currently undocumented within Gaston County.
○ = Locality record is accepted as valid but not supported by voucher specimens.
● = Locality record is substantiated by voucher specimens at the NC Museum of Natural Sciences or UNC-Charlotte.

Notes:

1 Four-toed salamanders are currently listed as Species of Special Concern within North Carolina. There is no historical record for this species within Gaston County, but there is a possibility of finding this rare salamander in appropriate habitat. Bog (*Sphagnum*) habitats should be checked for this species. (Alvin Braswell, pers. comm.).

[1] The base list for amphibians was compiled from voucher specimens at the NC Museum of Natural Sciences and UNCC, field survey notes and range maps in Martof et al. (1980). Nomenclature taken from Conant and Collins (1998).

Class: Amphibia[1]

FROGS AND TOADS Anura				
Family	**Common Name**	**Scientific Name**	**Record**	**Notes**
Pelobatidae				
	Eastern Spadefoot Toad	*Scaphiopus holbrookii holbrookii*	*	1
Bufonidae				
	American Toad	*Bufo americanus*	○	
	Fowler's Toad	*Bufo woodhouseii fowleri*	○	
Hylidae				
	Northern Cricket Frog	*Acris crepitans crepitans*	●	
	(Cope's) Gray Treefrog	*Hyla chrysoscelis*	○	
	Gray Treefrog	*Hyla versicolor*	*	2
	Northern Spring Peeper	*Pseudacris crucifer crucifer*	○	
	Upland Chorus Frog	*Pseudacris triseriata feriarum*	○	
Microhylidae				
	Eastern Narrowmouth Toad	*Gastrophryne carolinensis*	*	3
Ranidae				
	Bullfrog	*Rana catesbeiana*	○	
	Green Frog	*Rana clamitans melanita*	○	
	Pickerel Frog	*Rana palustris*	●	
	Southern Leopard Frog	*Rana utricularia*	●	

Record:

* = Species is possible but is currently undocumented within Gaston County.
○ = Locality record is accepted as valid but not supported by voucher specimens.
● = Locality record is substantiated by voucher specimens at the NC Museum of Natural Sciences or UNC-Charlotte.

Notes:

1 There is no record for this species in Gaston County, but there is a possibility of finding this species in appropriate habitat. Gaston County is on the western edge of this species known range (Conant and Collins, 1998 and Martof et al, 1980).

2 The exact range and distribution of *Hyla versicolor* is unknown within the state. This species is listed on the North Carolina Animal Watch list.

3 This species is common in Mecklenburg County. A voucher specimen should be collected for documentation in Gaston County. Gaston County is on the western edge of this species known range (Conant and Collins, 1998 and Martof et al, 1980).

[1] The base list for amphibians was compiled from voucher specimens at the NC Museum of Natural Sciences and UNCC, field survey notes and range maps in Martof et al. (1980). Nomenclature taken from Conant and Collins (1998).

FISH

Sixty-one species of fish have been recorded within streams or lakes within Gaston County. Four of these species are taken from historical records. They are not currently believed to be present in Gaston waters. Fourteen species are not native. They have been introduced from a number of sources, most for sport fishing. Refer to the five fish tables for more details. Four species of fish are discussed in the Rare Animal section.

The current status of many fish species within the county is unclear. Both stream and river species have been subjected to repeated impacts from an assortment of environmental contaminants. At times, contaminants have reached levels toxic to aquatic species (Dr. Ed Menhinick, pers. comm.). Sedimentation also remains as one of the primary destructive forces in Gaston's aquatic ecosystems. Gaston County's Quality of Natural Resources Commission has been working on cleaning up local watersheds, since 1988. Fortunately, stream habitats with intact natural hydrology can often recover, if left undisturbed over a long time period. Systematic electro-shock surveys should be done on streams county-wide to determine the current status of native stream fish.

All lakes within Gaston County are manmade. The fish species found within them are primarily introduced game species often with few native fish species present. Common fish found in Gaston County lakes and ponds include: mosquitofish (*Gambusia holbrooki*), largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), redbreast sunfish (*Lepomis auritus*), white crappie (*Pomoxis annularis*), pumpkinseed (*Lepomis gibbosus*) and white catfish (*Ameiurus catus*).

Gaston County's largest impoundments are Lake Wylie and Mountain Island Lake. Though the original river habitat has been significantly altered and the fauna significantly changed, these large lakes still provide excellent habitat for many species of native fish. These lakes are well known for quality sport fishing, especially for bass. Two state record fish have been caught in Lake Wylie. One was a bowfin (*Amia calva*) caught in 1976 and the other was a smallmouth buffalo (*Ictiobus bubalus*) caught in 1993 (NCWRC).

Aquatic ecosystems and animal species associated with them are among the most critically threatened of habitats within the county. Stream Watch programs and comprehensive surface water improvement programs like the ongoing project in the Long Creek watershed will be needed to preserve both vertebrate and invertebrate aquatic species. Best management practices need to be implemented in all watersheds throughout the county. Support of the Catawba "Riverkeeper" program will help to protect habitat and water quality for all aquatic species found within this portion of the Catawba River system.

Class: Osteichthyes[1]

FISHES Table 1						
Order	**Family**	**Common Name**	**Scientific Name**	**Stream**	**Lake**	**Introduced**
Lepisosteiformes						
	Lepisosteidae					
		Longnose gar	*Lepisosteus osseus* (Linnaeus)		*	
Amiiformes						
	Amiidae					
		Bowfin	*Amia calva* (Linnaeus)		*	
Clupeiformes						
	Clupeidae					
		Gizzard shad	*Dorosoma cepedianum* (Lesueur)	*	*	
		Threadfin Shad	*Dorosoma petenense* (Gunther)		*	*
Cypriniformes						
	Cyprinidae					
		Central Stoneroller	*Campostoma anomalum* (Rafinesque)	*		
		Goldfish	*Carassius auratus* (Linnaeus)		*	*
		Rosyside dace	*Clinostomus fundloides* Girard	*		
		Carp	*Cyprinus carpio* Linnaeus	*		*
		Eastern silvery minnow	*Hybognathus regius* Girard	*	*	
		Bluehead chub	*Nocomis leptocephalus* (Girard)	*		
		Golden shiner	*Notemigonus crysoleucas*	*	*	

[1] The base list for these six tables was compiled primarily from Menhinick (1991) and Cloutman and Olmsted (1979). All scientific names follow nomenclature from Robins et al. (1991).

			(Mitchill)			

Class: Osteichthyes

FISHES Table 2						
Order	**Family**	**Common Name**	**Scientific Name**	**Stream**	**Lake**	**Introduced**
		Greenfin shiner	*Cyprinella chloristius* (Jordan and Brayton)	*		
		Fieryblack shiner	*Cyprinella pyrrhomelas* (Cope)	*		
		Highfin shiner	*Notropis altipinnis* (Cope)	*		
		Greenhead shiner	*Notropis chlorocephalus* (Cope)	*		
		Spottail shiner	*Notropis hudsonius* (Clinton)	*	*	
		Highback chub	*Notropis hypsinotus* (Cope)	*		
		Swallowtail shiner	*Notropis procne* (Cope)	*		
		Sandbar shiner	*Notropis scepticus* (Jordan and Gilbert)	*		
		Creek chub	*Semotilus atromaculatus* (Mitchill)	*		
Cypriniformes						
	Catostomidae					
		Quillback carpsucker	*Carpiodes cyprinus* (Lesueur)		*	
		Highfin carpsucker[1]	*Carpiodes velifer* (Rafinesque)		*	
		White sucker	*Catostomus commersoni* (Lacepede)	*	*	
		Creek chubsucker	*Erimyzon oblongus*	*	*	
		Bigmouth buffalo	*Ictiobus cyprinellus* (Valenciennes)		*	*
		Smallmouth buffalo	*Ictiobus bubalus* (Rafinesque)		*	*P**
		Silver redhorse	*Moxostoma anisurum* (Rafinesque)		*	

[1] Highfin carpsucker is listed as a North Carolina Species of Special Concern.

P = probable introduction

Class: Osteichthyes

FISHES Table 3						
Order	**Family**	**Common Name**	**Scientific Name**	**Stream**	**Lake**	**Introduced**
		Shorthead redhorse	*Moxostoma macrolepidotum* (Lesueur)		*	
		Suckermouth redhorse	*Moxostoma pappillosum* (Cope)		*	
		Smallfin redhorse	*Moxostoma robustum* (Cope)	*		
		Striped jumprock	*Moxostoma rupiscartes* Jordan and Jenkins	*		
Siluriformes						
	Ictaluridae					
		White catfish	*Ameiurus catus* (Linnaeus)	*	*	
		Brown bullhead	*Ameiurus nebulosus* (Lesueur)	*	*	
		Flat bullhead	*Ameiurus platycephalus* (Girard)	*		
		Channel catfish	*Ictalurus punctatus* (Rafinesque)		*	*
		Margined madtom	*Noturus insignis* (Richardson)	*		
Salomoniformes						
	Esocidae					
		Redfin pickeral	*Esox americanus* Gmelin	*		
Atheriniformes						
	Poeciliidae					
		Eastern mosquitofish	*Gambusia holbrooki* Girard		*	
Perciformes						
	Percichthyidae					
		White bass	*Morone chrysops* (Rafinesque)		*	*
		Striped bass	*Morone saxatilis* (Walbaum)		*	*

	Centrarchidae					

Class: Osteichthyes

FISHES Table 4						
Order	**Family**	**Common Name**	**Scientific Name**	**Stream**	**Lake**	**Introduced**
		Rockbass	*Ambloplites rupestris* (Rafinesque)		*	*
		Redbreast sunfish	*Lepomis auritus* (Linnaeus)	*	*	
		Green sunfish	*Lepomis cyanellus* Rafinesque		*	*
		Pumpkinseed	*Lepomis gibbosus* (Linnaeus)	*	*	
		Warmouth	*Lepomis gulosus* (Cuvier)	*	*	
		Bluegill	*Lepomis macrochirus* Rafinesque	*	*	
		Dollar sunfish	*Lepomis marginatus* (Holbrook)	*		
		Redear sunfish	*Lepomis microlophus* (Gunther)	*	*	*
		Largemouth bass	*Micropterus salmoides* (Lacepede)	*	*	* -?
		White crappie	*Pomoxis annularis* Rafinesque		*	*
		Black crappie	*Pomoxis nigromaculatus* (Lesueur)		*	

Class: Osteichthyes

FISHES Table 5						
Order	**Family**	**Common Name**	**Scientific Name**	**Stream**	**Lake**	**Introduced**
Perciformes						
	Percidae					
		Fantail darter	*Etheostoma flabellare* Rafinesque	*		
		Swamp darter	*Etheostoma fusiforme* (Girard)		*	
		Tessellated darter	*Etheostoma olmstedi* Storer	*	*	
		Seagreen darter	*Etheostoma thalassinum* (Jordan and Brayton)	*		
		Yellow perch	*Perca flavescens* (Mitchill)	*	*	
		Walleye	*Stizostedion vitreum* (Mitchill)		*	*

Class: Osteichthyes

FISHES Table 6 Historical Records						
Order	**Family**	**Common Name**	**Scientific Name**	**Stream**	**Lake**	**Introduced**
Anguilliformes	Anguillidae	American Eel[1]	*Anguilla rostrata* (Lesueur)		*	
Cypriniformes	Catostomidae	River carpsucker[2]	*Carpiodes carpio* (Rafinesque)	*	*	*
		Thicklip chub[3]	*Cyprinella labrosa*		*	
		Santee chub[4]	*Cyprinella zanema*		*	

[1] One record from Mountain Island Lake. This species ranged far inland along the Catawba corridor prior to the construction of impoundments. (Cloutman and Olmsted, 1979)
[2] One known record from Lake Wylie from 1974. This specimen is believed to have been introduced (Cloutman and Olmsted, 1979). The river carpsucker is listed as a Species of Special Concern in N.C.
[3] It is believed that both of these species ranged through this area of the Catawba River basin prior to the construction of impoundments. Habitat for these species may no longer be present. [Cloutman and Olmsted (1979) and Rohde et al. (1994)]. The thicklip chub is on the NC Animal Watch List.
[4] Same as #3 above. Except, the Piedmont population of the Santee chub is listed as "Significantly Rare."

APPENDIX 3. SELECTED INVERTEBRATE SPECIES OF GASTON COUNTY, NORTH CAROLINA

INVERTEBRATE SPECIES

Invertebrate species comprise the largest percentage of the total number of animal species within Gaston County. The total number of invertebrate species in this county (as in all of the rest) is vast and unknown. In 1998, the Schiele Museum of Natural History implemented the first phase of a comprehensive county-wide arthropod survey to collect, identify and document as many of these species as possible. Over 10,000 specimens were collected during the first season. This is a tremendous undertaking, which will yield important findings about arthropod species occurrence and distribution within the county and the region. Duane Flynn, entomologist at the Schiele Museum, is directing this survey.

Some work previously has been done documenting invertebrate animals within Gaston County. Two lists are included below. Inclusion of this preliminary information may help shed light on specific species to collect or on habitats to search during the county-wide arthropod survey.

Gaston County has a good diversity of butterfly species. The butterfly species list includes sight records for 85 species of butterflies and skippers found within the county. Skilled, reliable field observers have documented these records. Nine butterfly species are discussed in the Rare Animal section in Chapter 4. Records for two species require further documentation. Refer to the butterfly list for specific details.

On September 9, 1994, Dr. Hal Mahan, retired President of the Roger Tory Peterson Institute, surveyed the grounds of the Daniel Stowe Botanical garden and created the garden's initial butterfly species list. This list now stands at 22 species. On May 27, 1995, Gaston County was the site of the founding meeting of the Carolina Butterfly Society. This meeting was co-hosted by the Schiele Museum of Natural History and Crowders Mountain State Park. Twenty-one species were found in the park (despite cool, cloudy conditions), in a single afternoon. Additional butterfly data for Gaston County was compiled from LeGrand and Howard (1998) and from field notes. Host plants and nectar plants are included on the butterfly list. Common names are used for most of these plants to help make this list more accessible to the general public.

Potential habitat exists for three butterfly species that, while not expected, potentially could be found in Gaston County. Paul Hart (pers. comm.), former ranger at Crowders Mountain State Park, has suggested that the bear oak habitat on the peaks within the park be surveyed for a possible Edward's hairstreak (*Satyrium edwardsii*). Cofaqui giant skipper (*Megathymus cofaqui*) are very rare. LeGrand and Howard (1998) state that they might be found on mountain tops with yucca on rock outcrops. There could be a slim chance of finding this butterfly at Crowders Mountain State Park. Diana fritillary (*Speyeria diana*) is a "significantly rare" species that has been found in Cleveland County. This butterfly nectars on milkweed (*Asclepias spp.*), joe-pye weed (*Eupatorium spp.*) and ironweed (*Veronia spp.*). Its larval hostplant is violet (*Viola spp.*) (LeGrand and Howard, 1998). It may be extirpated from the Piedmont, but there might be a slim chance of finding this species in Gaston County.

A variety of macroinvertebrates have been documented in Gaston County during stream sampling bioassessments. A brief list of these organisms is also included here.

Order: Lepidoptera

Butterflies[1]

Eighty-five species of butterflies and skippers have now been documented within Gaston County. Underlined species names are those species found within Gaston County that are listed on the North Carolina Rare Animal List or the Watch list. (See the rare species tables in Appendix 7 for details.) (**) indicates further documentation is needed before this record can be accepted. Species shown in bold print are from field surveys that have yet to be reported for inclusion in LeGrand and Howard (1998).

Common Name	Scientific Name	Common Host Plants: Food / Nectar
Pipevine Swallowtail	*Battus philenor*	Dutchman's Pipe,Turpentine Root/ various
Zebra Swallowtail	*Eurytides marcellus*	Pawpaws (*Asimina* spp.)/ various
Black Swallowtail	*Papilio polyxenes*	Parsley family spp. / Milkweed spp.
Eastern Tiger Swallowtail	*Papilio glaucus*	Tulip-poplar / Joe-pye-weeds & Milkweeds
Spicebush Swallowtail	*Papilio troilus*	Spicebush & Sassafras / Milkweed spp.
Palamedes Swallowtail	*Papilio palamedes*	Sassafras ? / Blazing star
Cabbage White	*Pieris rapae*	Mustard spp. / various
Falcate Orangetip	***Anthocharis midea***	**Mustard spp. / various**
Clouded Sulphur	*Colias philodice*	Bean family spp. / Bean family spp.
Orange Sulphur	*Colias eurytheme*	Bean family spp. / Clover spp.
Cloudless Sulphur	*Phoebis sennae*	Sennas / various
Barred Yellow	*Eurema daira*	Bean family spp. / unknown
Little Yellow	***Eurema lisa***	**Bean family spp. / various (low lying)**
Sleepy Orange	*Eurema nicippe*	*Cassia* spp. / various
Harvester	*Feniseca tarquinius*	wooly aphids / none
American Copper	*Lycaena phlaeas*	Sorrel & Dock spp. / various
Coral Hairstreak	*Satyrium titus*	Cherry & Plum spp. / Butterfly weed
Banded Hairstreak	*Satyrium calanus*	Oaks & Hickories / Milkweeds
Striped Hairstreak	*Satyrium liparops*	Cherry & Blueberry spp. / Milkweeds
Southern Hairstreak **	***Satyrium liparops***	**Oaks / Sparkleberry**
Brown Elfin	*Callophrys augustinus*	Blueberry spp. / Blueberrys & Horse Sugar

[1] The base list for butterflies was compiled from LeGrand and Howard (1998).

Order: Lepidoptera, continued

Common Name	Scientific Name	Common Host Plants: Food / Nectar
Eastern Pine Elfin	*Callophrys niphon*	Pines / Blueberry spp., Cherry & Plums
Gray Hairstreak	***Strymon melinus***	**Legumes / various**
Red-banded Hairstreak	*Calycopis cecrops*	Sumacs and Oaks / various
Ceraunus Blue	*Hemiargus ceraunus*	woody Bean family spp. / unknown
Eastern Tailed -Blue	*Everes comyntas*	herbaceous Bean family spp. / various
Spring Azure (complex)	*Celastrina ladon*	various / various
American Snout	***Libytheana carinenta***	**Hackberries / sap, dung**
Gulf Fritillary	***Agraulis vanillae***	**Maypops / various**
Variegated Fritillary	***Euptoieta claudia***	**Violets, Maypops / various**
Great Spangled Fritillary	*Speyeria cybele*	Violet spp. / Milkweeds, Joe-pye-weeds
Meadow Fritillary **	***Bolornia bellona***	**Violets / various (low lying)**
Silvery Checkerspot	*Chlosyne nycteis*	Sunflowers & Rosinweeds / same
Pearl Crescent	*Phyciodes tharos*	Asters / various
Question Mark	*Polygonia interrogationis*	Elms & Hackberries / sap, old fruit, carrion
Eastern Comma	*Polygonia comma*	Nettles & Elms / sap, old fruit, carrion
Mourning Cloak	*Nymphalis antiopa*	various tree & shrubs / sap, old fruit
American Lady	*Vanessa virginiensis*	Pussy-toes & Cudweeds / various
Red Admiral	***Vanessa atalanta***	**Nettles / various**
Common Buckeye	***Junonia coenia***	**Plantains / Clovers**
Red-spotted Purple	*Limenitis arthemis*	Cherry & Plums / sap, carrion
Viceroy	*Limenitis archippus*	Willows / various
Hackberry Emperor	***Asterocampa celtis***	**Hackberries / sap, old fruit, carrion**
Tawny Emperor	*Asterocampa clyton*	Hackberries / sap, old fruit, carrion
Creole Pearly-Eye	*Enodia creola*	Switchcane / sap, old fruit, mud
Appalachian Brown	*Satyrodes appalachia*	Sedges / sap, dung, old fruit
Gemmed Satyr	*Cyllopsis gemma*	Grasses / sap, dung, old fruit

Order: Lepidoptera, continued

Common Name	Scientific Name	Common Host Plants: Food / Nectar
Carolina Satyr	*Hermeuptychia sosybius*	Grasses / carrion, sap, old fruit
Georgia Satyr	*Neonympha areolata*	Sedges / carrion, sap, old fruit
Little Wood-Saytr	*Megisto cymela*	Grasses / carrion, sap, old fruit
Common Wood Nymph	*Cercyonis pegala*	Grasses / dung, sap, old fruit
Monarch	***Danaus plexippus***	**Milkweeds / Milkweeds & Asters**
Silver-spotted Skipper	*Epargyreus clarus*	Bean family spp. / various
Long-tailed Skipper	*Urbanus proteus*	Bean family spp. / various
Golden-banded Skipper	*Autochton cellus*	Hog Peanut / various
Hoary Edge	*Achalarus lyciades*	Beggar's Lice / various
Southern Cloudywing	*Thorybes bathyllus*	Goat's-rue, Beggar's Lice / various
Northern Cloudywing	*Thorybes pylades*	Goat's-rue, Beggar's Lice / various
Confused Cloudywing	*Thorybes confusis*	unknown / unknown
Hayhurst's Scallopwing	*Staphylus hayhurstii*	Lamb's-quarters / various
Sleepy Duskywing	*Erynnis brizo*	Oaks / unclear
Juvenal's Duskywing	*Erynnis juvenalis*	Oaks / various
Horace's Duskywing	*Erynnis horatius*	Oaks / various
Mottled Duskywing	*Erynnis martialis*	New Jersey tea / various
Zarucco Duskywing	*Erynnis zarucco*	Bean family spp. / various
Common Checkered-Skipper	***Pyrgus communis***	**Mallow family / Clovers & composites**
Common Sootywing	***Pholisora catullus***	**Lamb's-quarters / Clovers & various**
Swarthy Skipper	*Nastra lherminier*	Little Bluestem / various
Clouded Skipper	*Lerema accius*	Grasses / Gerardia & various
Least Skipper	*Ancyloxypha numitor*	Grasses / various
Southern Skipperling	*Copaeodes minimus*	short Grasses / various
Fiery Skipper	*Hylephila phyleus*	Bermuda & Crab Grass / various
Cobweb Skipper	*Hesperia metea*	Broomsedge & Bluestem / various

Order: Lepidoptera, continued

Common Name	Scientific Name	Common Host Plants: Food / Nectar
Tawny-edged Skipper	***Polites themistocles***	**Grasses / various**
Crossline Skipper	*Polites origenes*	Purple top Grass / Colicroot & Blazing Star
Southern Broken-Dash	*Wallengrenia otho*	Grasses / Blazing stars, various forbs
Little Glassywing	*Pompeius verna*	Purple top / Mountain mint, Indian hemp
Sachem	*Atalopedes campestris*	Bermuda & Crab Grass / various
Delaware Skipper	*Anatrytone logan*	Grasses / Milkweeds, Thistles, Buttonbush
Hobomok Skipper	*Poanes hobomok*	Panic & Blue Grasses / various
Zabulon Skipper	*Poanes zabulon*	Grasses / various
Dun Skipper	***Euphyes vestris***	**Sedges / various**
Lace-winged Roadside Skipper	*Amblyscirtes aesculapius*	Switchcane / Sunflowers & Coneflowers
Carolina Roadside Skipper	*Amblyscirtes carolina*	Switchcane / various
Reversed Roadside Skipper	*Amblyscirtes reversa*	Switchcane / various
Eufala Skipper	*Lerodea eufala*	Grasses / various

"Obscure record" (see rare animal list, Appendix 4)

Long Dash**	*Polistes mystic*	Grasses, bluegrass / Milkweed, Mtn. laurel

Notes:

Based upon this list: 71% of all species found within the Piedmont of the Carolinas currently have been documented within Gaston County. Eight-five species out of 120. (This does not include Long Dash.)

The following species are expected to occur but have yet to be documented within Gaston County.

Pearly-Eye (species)	*Enodia sp. (portlandia/anthedon)*	Switchcane / sap, old fruit, mud
Leonard's Skipper	*Hesperia leonardus*	Broomsedge & Bluestem / various
Zabulon Skipper	*Poanes zabulon*	Grasses / various

Benthic Macro-Invertebrate Species[1]

Ephemeroptera

Baetidae
Hexagenia spp.
Stenacron spp.
Stenonema spp.

Plecoptera

Eccoptura spp.
Leuctridae

Trichoptera

Ceratopsyche spp.
Diplectrona spp.
Hydropsyche spp.
Lepidostoma spp.
Psilotreta spp.
Pycnopsyche spp.
Rhyacophila spp.

Coleptera

Celina spp.
Curculionidae
Helichus spp.
Hydrophilidae
Psephenus spp.
Ptilodactylidae
Spanglerogyrus sp.

Collembola

Unknown

Diploda

Unknown

Diptera

Bittacomorpha clavipes
Chaoboris spp.
Chaoboridae
Chironomidae
Ephydridae
Simulidae
Tipulidae
Tipula spp.

Hemiptera

Corixidae
Gerridae
Rhagovelia spp.
Trepobates spp.
Sigara spp.

Megaloptera

Nigronia spp.
Sialis spp.

Odonata

Arigomphus spp.
Boyeria spp.
Calopteryx spp.
Coenagrionidae
Cordulegaster spp.
Enallagma spp.
Ophiogomphus spp.
Progomphus spp.
Stylogomphus spp.

Oligochaeta

Unknown

[1] Data obtained from Jeff Levi, Mountain Island Lake Conservation Area Baseline Report, and from grab sampling result data taken from the NC Cooperative Extension, Gaston County Water Quality Monitoring Program.

APPENDIX 4. RARE FAUNA OF GASTON COUNTY, NORTH CAROLINA

RARE VERTEBRATE FAUNA[1]

COMMON NAME	SCIENTIFIC NAME	N.C. STATUS	U.S. STATUS	N.C. RANK	GLOBAL RANK	SOURCE/ LOCATION
MAMMALS						
Little Brown Myotis	*Myotis lucifugus*	W2/W3		S3	G5	Deidri Sarver. CMSP. Pond.
Long-tailed Weasel	*Mustela frenata*	W3		S3?	G5	This species occurs throughout the state but is declining. (Webster et al., 1985). There is a Mecklenburg County record (Lee et al., 1982).
BREEDING BIRDS						
Great Blue Heron	*Ardea herodias*	W2		S3B/ S5N	G5	Possible breeder. Expanding breeding range. Recent breeding records in Cabarrus Co. and Lake Norman in Mecklenburg County.
Black Vulture	*Coragyps atratus*	SC		S3	G5	CMSP - breeding records and roosting site records.
Cooper's Hawk	*Accipiter cooperii*	SC		S3B/ S3N	G4	NCWRC. Breeder. Current documentation needed. (Breeds in Mecklenburg.)
American Kestrel	*Falco sparverius*	W1 / W5		S3B/ S5N	G5	NCWRC. Breeder. Current documentation needed.
Barn Owl	*Tyto alba*	W2 / W3		S3B/ S3N	G5	Current breeding records. (Masters thesis-Marek K. Smith-UNCC.)
Loggerhead Shrike	*Lanius ludovicianus*	SC		S3B / S3N	G4G5T4T5	Duane Crane. Current breeding records.
REPTILES						
Bog Turtle	*Clemmys muhlenbergii*	T	T	S2	G3	Jim Green (Schiele Museum) and Dennis Herman (NCHS).
Gulf Coast Spiny Softshell	*Apalone spinifera aspera*	W2		S3	G5T?	D. Seriff. Becoming rare. Lake Wylie.

[1] Status and Rank taken from LeGrand and Hall (1997). See Appendix 7.

RARE VERTEBRATE FAUNA, CONTINUED[1]

COMMON NAME	SCIENTIFIC NAME	N.C. STATUS	U.S. STATUS	N.C. RANK	GLOBAL RANK	SOURCE/ LOCATION
Timber Rattlesnake	*Crotalus horridus*	SR		S3	G4T4	CMSP. P. Hart, D. Sarver, J. Sox. Regularly sighted each year.
Carolina Pygmy Rattlesnake	*Sistrurus miliarius miliarius*	SR@		S3	G5	CMSP. Paul Hart (1982 & 1984). No recent records. Status unknown.
FISH						
River Carpsucker	*Carpiodes carpio*	SC		SH	G5	Lake Wylie. One historic record, 1974. Cloutman and Olmsted (1979). Outside normal range. Believed introduced and extirpated.
Highfin Carpsucker	*Carpiodes velifer*	SC		S2	G4G5	Catawba River on Lake Wylie. Menhinick (1991). Status unknown.
Santee Chub	*Cyprinella zanema*	SR		S3	G3T3	Catawba River. Historic range and habitat. Cloutman and Olmsted (1979). Rodhe (1994). Believed extirpated.
Thicklip Chub	*Cyprinella labrosa*	W2		S3	G3	Catawba River. Historic range and habitat. Cloutman and Olmsted (1979). Rodhe (1994). Believed extirpated.

RARE INVERTEBRATE FAUNA[1]

COMMON NAME	SCIENTIFIC NAME	N.C. STATUS	U.S. STATUS	N.C. RANK	GLOBAL RANK	SOURCE/ LOCATION
BUTTERFLIES						
Southern Hairstreak	*Satyrium liparops*	SR		S2	G4T4	Jim Nottke. Daniel Stowe Butterfly count, 1998. Significantly outside of documented range.
Brown Elfin	*Callophyrs augustinus*	W3		S3S4	G5	Confirmed record. LeGrand and Howard (1998).
Confused Cloudywing	*Thorybes confusis*	W3		S3?	G4	Confirmed record. LeGrand and Howard (1998).
Cobweb Skipper	*Hesperia metea*	W2,W3		S3?	G4G5	Confirmed record. LeGrand and Howard (1998).
Carolina Roadside Skipper	*Amblyscirtes carolina*	W2,W3		S3S4	G4	Confirmed record. LeGrand and Howard (1998).
Reversed Roadside Skipper	*Amblyscirtes reversa*	SR		S3	G4	Historic record. NC Natural Heritage. LeGrand and Hall (1997).

[1] Status and Rank taken from LeGrand and Hall (1997). See Appendix 7.

RARE INVERTEBRATE FAUNA, CONTINUED[1]

COMMON NAME	SCIENTIFIC NAME	N.C. STATUS	U.S. STATUS	N.C. RANK	GLOBAL RANK	SOURCE/ LOCATION
Golden-banded Skipper	*Autochton cellus*	SR		S1S2	G4	Historic record. NC Natural Heritage. LeGrand and Hall (1997).
Mottled Dusky Wing	*Erynnis martialis*	SR		S3	G4	Historic record. NC Natural Heritage. LeGrand and Hall (1997).
Long Dash	*Polistes mystic*	SR		SR	G5	Obscure record. Listed as confirmed for Gaston County on NBS internet site. Significantly out of range. LeGrand and Howard (1998).
MILLIPEDES						
A millipede	*Croatania catawba*	W3		S?	G?	Taggert (1981). Status unknown.
A millipede	*Deltotaria lea*	W3		S?	G?	CMSP. Initial site survey. Status unknown.
A millipede	*Pachydesmus crassicutus incursus*	W3		S?	G?	Listed record, NC NHP (1992), Gaston/Cleveland counties. Status unknown.

HYPOTHETICAL OR RARE TRANSIENT SPECIES[1]

COMMON NAME	SCIENTIFIC NAME	N.C. STATUS	U.S. STATUS	N.C. RANK	GLOBAL RANK	SOURCE
MAMMALS						
Northern Myotis	*Myotis septentrionalis*	SC		SUB/S2N	G4	NCWRC. Hypothetical.
Seminole Bat	*Lasiurus seminolus*	W2/W3		S3B/SZN	G5	Lee et al. (1982), Hypothetical. There is a Mecklenburg County record.
Meadow Jumping Mouse	*Zapus hudsonius*	W2		S3	G5	Webster et al. (1984). Open wet areas and moist brushy forest edges. Hypothetical.
Old-field Mouse	*Peromyscus polionotus*	SR		S1	G5	NCWRC. Hypothetical.

[1] Status and Rank taken from LeGrand and Hall (1997). See Appendix 7.

HYPOTHETICAL OR RARE TRANSIENT SPECIES, CONTINUED[1]

COMMON NAME	SCIENTIFIC NAME	N.C. STATUS	U.S. STATUS	N.C. RANK	GLOBAL RANK	SOURCE
Black Bear	*Ursus americanus*	SR		S3	G5	Rare transient in western Piedmont.
MIGRANT BIRDS[2]						
Bald Eagle	*Haliaeetus leucocephalus*	E	T	S2B/ S2N	G4	Uncommon transient along Catawba River. Increasing.
Peregrine Falcon	*Falco peregrinus*	E	E	S1B,S2N	G4	Uncommon transient. (Soon to be delisted.)
Cerulean Warbler	*Dendroica cerulea*	SR	FSC	S3B,SZN	G5	Rare migrant.
MUSSELS						
Carolina Heelsplitter	*Lasmigona decorata*	E	E	S1	G1	Historic range in Catawba drainages. No specimens collected in Gaston County. Hypothetical. LeGrand and Hall (1997).
Carolina Creekshell	*Villosa vaughaniana*	SC		S2	G2	Historic range in Catawba drainages. No specimens collected in Gaston County. Hypothetical. LeGrand and Hall (1997).

[1] Status and Rank taken from LeGrand and Hall (1997). See Appendix 7.

[2] Status and Rank information for birds only applies to breeding bird populations. These three transient species have been included on the list out of general interest, because of their U.S. Status. Other NC listed bird species have been documented as migrants within Gaston County, but they are not listed because they do not breed here and they do not have a listed U.S. Status.

APPENDIX 5. CROWDERS MOUNTAIN STATE PARK FLORA LIST[1]

Following is a general list of plant species found in the park. A detailed botanical survey of the park, especially the area around Kings Pinnacle, still needs to be performed.

ACANTHACEAE
Ruellia caroliniensis (Walter) Steudel. Ruellia

ACERACEAE
Acer rubrum L. Red maple

AMARYLLIDACEAE
Hypoxis hirsuta (L.) Coville. Yellow star-grass

ANACARDIACEAE
Rhus copallina L. Winged sumac
Rhus glabra L. Smooth sumac
Rhus radicans L. Poison ivy

APIACEAE
Daucus carota L. Queen Anne's Lace

APOCYNACEAE
Apocynum cannabinum L. Indian hemp

AQUILFOLIACEAE
Ilex opaca Aiton. American holly

ARACEAE
Arisaema triphyllum (L.) Schott. Jack-in-the-pulpit

ARISTOLOCHIACEAE
Hexastylis virginica (L.) Small. Wild ginger

ASCLEPIADACEAE
Asclepias tubersoa L. Butterfly-weed

ASPIDIACEAE
Athyrium asplenioides (Michaux) A.A. Eaton. Southern lady fern
Polystichum acrostichoides (Michaux) Schott. Christmas fern
Thelypteris noveboracensis (L.) Nieuwland. New York fern

ASPLENIACEAE
Asplenium bradleyi D.C. Eaton. Bradley's spleenwort
Asplenium montanum Willd. Mountain spleenwort
Asplenium platyneuron (L.) Oakes. Ebony spleenwort

ASTERACEAE
Antennaria solitaria Rydberg. Pussy-toes
Aster linariifolius L. Stiff-leaved aster

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[1] Nomenclature follows Radford, A.E., H.E. Ahles and C.R. Bell (1968). Manual of the vascular flora of the Carolinas. The University of North Carolina Press. Chapel Hill, N.C.

Aster nova-angliae L. New England aster
Aster patens Aiton. Late purple aster
Baccharis halimifolia L. Groundsel-tree
Chrysogonum virginianum L. Green-and-gold
Coreopsis major var. *stellata* (Nuttall) Robinson. Coreopsis
Erechtites hieracifolia (L.) Raf. Fireweed
Erigeron strigosus Muhl. ex Willd. Daisy fleabane
Eupatorium aromaticum L. White snakeroot
Eupatorium coelestinum L. Mistflower
Eupatorium fistulosum Barratt. Joe-pye-weed
Eupatorium hyssopifolium L. Thoroughwort
Gnaphlium obtusifolium L. Rabbit tobacco
Helenium amarum (Raf.) H. Rock. Bitter-weed
Helianthus laevigatus T. & G. Smooth sunflower
Heterotheca graminifolia (Michaux) Shinners. Golden aster
Hieracium gronovii L. Hawkweed
Hieracium venosum L. Rattlesnake-weed
Lactuca canadensis L. Wild lettuce
Liatris graminifolia Willd. Grass-leaved blazing star
Liatris regimontis (Small) K. Schumann. Kings Mountain blazing star
Liatris spicata var. *spicata* (L.) Willd.
Mikania scandens (L.) Willd. Climbing hempweed
Rudbeckia hirta L. Black-eyed Susan
Silphium compositum Michaux. Rosinweed
Solidago altissima L. Goldenrod
Solidago caesia L. Blue-stem goldenrod
Solidago erecta Pursh. Slender goldenrod
Solidago nemoralis Aiton. Gray goldenrod
Solidago odora Aiton. Fragrant goldenrod
Taraxacum officinale Wiggers. Dandelion
Vernonia glauca (L.) Willd. Ironweed

BALSAMINACEAE
Impatiens capensis Meerb. Spotted touch-me-not

BERBERIDACEAE
Podophyllum peltatum L. May-apple

BETULACEAE
Alnus serrulata (Aiton) Willd. Tag alder
Carpinus caroliniana Walter. Ironwood
Corylus cornuta Marshall. Beaked hazel-nut

BIGNONIACEAE
Campsis radicans (L.) Seemann. Trumpet creeper

BLECHNACEAE
Woodwardia areolata (L.) Moore. Netted chain-fern

BRASSICACEAE
Cardamine hirsuta L. Bitter cress
Lepidium campestre (L.) R. Brown. Shepherd's purse

CALYCANTHACEAE
Calycanthus floridus L. Sweet-shrub

Appendix 5. Crowders Mountain State Park Flora List

CAMPANULACEAE
Campanula divaricata Michaux. Bluebell
Lobelia cardinalis L. Cardinal flower
Lobelia puberula Michaux. Downy lobelia

CAPRIFOLIACEAE
Lonicera japonica Thunberg. Japanese honeysuckle

CARYOPHYLLACEAE
Dianthus armeria L. Deptford pink
Paronychia argyrocoma (Michaux) Nuttall. Silverling
Stellaria media (L.) Cyrillo. Chickweed

CELASTRACEAE
Euonymus americanus L. Strawberry bush / Hearts-a-burstin'

COMMELINACEAE
Commelina virginica L. Dayflower

CONVOLVULACEAE
Ipomoea pandurata (L.) G. F. W. Meyer. Man-root

CORNACEAE
Cornus ammomum Miller. Silky dogwood
Cornus florida L. Flowering dogwood

CUPPRESSACEAE
Juniperus communis var. *depressa* Pursh. Ground juniper

DIAPENSIACEAE
Galax aphylla L. Galax

DIOSCOREACEAE
Dioscorea villosa var. *villosa* L. Wild yam

EBONACEAE
Diospyros virginiana L. Persimmon

ELAEAGNACEAE
Elaeagnus umbellata Thunberg. Autumn olive

ERICACEAE
Chimaphila maculata (L.) Pursh. Spotted wintergreen
Epigea repens L. Trailing arbutus
Gaylussacia baccata (Wang.) K. Koch. Black huckleberry (formerly *G. resinosa*)
Gaylussacia frondosa (L.) T. & G. Dangleberry
Kalmia latifolia L. Mountain laurel
Leiophyllum buxifolium (Bergius) Ell. Sand myrtle
Oxydendrum arboreum (L.) DC. Sourwood
Rhododendron catawbiense Michaux. Catawba rhododendron
Rhododendron minus Michaux. Carolina rhododendron / punctatum
Rhododendron periclymenoides (L.) Torrey. Pinxter azalea
Vaccinium arboreum Marshall. Sparkleberry
Vaccinium constablaei Gray. Mountain highbush blueberry
Vaccinium stamineum L. Squaw-huckleberry
Vaccinium vacillans Torrey. Wild blueberry

EUPHORBIACEAE

Euphorbia corollata L. Flowering spurge

FABACEAE

Albizia julibrissin Durazzini. Mimosa
Amorpha fruticosa L.
Amorpha schwerinii Schneider. Piedmont indigo bush
Baptisia tinctoria (L.) R. Brown. Wild indigo
Cassia fasciculata Michaux. Partridge pea
Cassia nictitans L. Wild sensitive plant
Cercis canadensis L. Redbud
Clitoria mariana L. Butterfly pea
Desmodium canescens (L.) DC. Beggar's lice
Desmodium ciliare (Muhl. ex Willd.) DC.
Desmodium nudiflorum (L.) DC.
Medicago lupulina L. Black medic
Melilotus alba Desr. White sweet clover
Melilotus officinalis (L.) Lam. Yellow sweet clover
Pueraria lobata (Willd.) Ohwii. Kudzu
Robinia hispida L. Bristly locust
Robinia psuedo-acacia L. Black locust
Schrankia microphylla (Solander ex Smith) Macbride. Sensitive briar
Tephrosia virginiana (L.) Persoon. Goat's rue
Thermopsis mollis var. *mollis* (Michaux) M.A. Curtis ex Gray. Appalachian golden-banner
Trifolium spp. Yellow hop clover

FAGACEAE

Castanea dentata (Marshall) Borkh. American chestnut
Fagus grandifolia Ehrhart. American beech
Quercus alba L. White oak
Quercus coccinea Muenchh. Scarlet oak
Quercus falcata Michaux. Southern red oak
Quercus ilicifolia Wang. Bear oak
Quercus marilandica Muenchh. Black jack oak
Quercus michauxii Nuttall. Swamp chestnut oak
Quercus prinus L. Chestnut oak
Quercus rubra L. Northern red oak
Quercus velutina Lam. Black oak

GENTIANACEAE

Sabatia angularis (L.) Pursh. Rose pink

HAMAMELIDACEAE

Fothergilla major (Sims) Lodd. Mountain witch-alder
Hamamelis virginiana L. Witch-hazel
Liquidambar styraciflua L. Sweet-gum

HYPERICACEAE

Hypericum spp. St. John's wort
Hypericum hypericoides (L.) Crantz. St. Andrew's cross
Hypericum mutilum L. Dwarf St. John's-wort
Hypericum prolificum L. Shrubby St. John's-wort
Hypericum punctatum Lam. Spotted St. John's-wort

Appendix 5. Crowders Mountain State Park Flora List

IRIDACEAE

Iris cristata Aiton. Dwarf crested iris
Sisyrinchium mucronatum Michaux. Blue-eyed grass

JUGLANDACEAE

Carya tomentosa (Poiret) Nuttall. Mockernut hickory
Carya glabra (Miller) Sweet. Pignut hickory
Carya ovata (Miller) K. Koch. Shagbark hickory

LAMIACEAE

Lamium amplexicaule L. Henbit
Lamium purpureum L. Purple dead-nettle
Prunella vulgaris L. Heal-all
Scutellaria integrifolia L. Skullcap
Trichostema dichotomum L. Blue curls

LAURACEAE

Sassafras albidum (Nuttall) Nees. Sassafras

LILIACEAE

Aletris farinosa L. Colicroot
Erythronium americanum Ker. Trout lily
Lilium michauxii Poiret. Carolina lily
Medeola virginiana L. Indian cucumber-root
Polygonatum biflorum (Walter) Ell. Solomon's seal
Smilacina racemosa (L.) Desf. False Solomon's-seal
Smilax biltmoreana (Small) Ahles. Biltmore carrion-flower
Smilax glauca Walter. Greenbrier
Smilax rotundifolia L.
Stenanthium gramineum (Ker) Morong. Featherbells
Trillium cernuum L. Nodding trillium
Xerophyllum asphodeloides (L.) Nuttall. Turkey-beard
Yucca filamentosa var. *filamentosa* L. Bear-grass

LINACEAE

Linum virginianum L. Yellow flax

LYCOPODIACEAE

Lycopodium flabelliforme (Fernald) Blanchard. Running-pine

MAGNOLIACEAE

Liriodendron tulipifera L. Tulip tree

MELASTOMATACEAE

Rhexia mariana L. Pale meadow-beauty

MYRICACEAE

Comptonia peregrina (L.) Coulter. Sweet fern

NYSSACEAE

Nyssa sylvatica Marshall. Black gum

OLEACEAE

Fraxinus americana L. White ash
Ligustrum sinense Lour. Privet

ONAGRACEAE
Ludwigia alternifolia L. Seedbox
Oenothera biennis L. Evening primrose
Oenothera laciniata Hill.

ORCHIDACEAE
Goodyera pubescens (Willd.) R. Brown. Downy rattlesnake plantain
Habenaria ciliaris (L.) R. Brown. Yellow fringed-orchid
Tipularia discolor (Pursh) Nuttall. Crane-fly orchid

OROBANCHACEAE
Epifagus grandifolia (L.) Barton. Beech-drops.
Conopholis americana (L.) Wallroth. Squaw-root

OSMUNDACEAE
Osmunda cinnamomea L. Cinnamon fern

PAPAVERACEAE
Sanguinaria canadensis L. Bloodroot

PHYTOLACCACEAE
Phytolacca americana L. Pokeweed

PINACEAE
Pinus echinata Miller. Short-leaf pine
Pinus virginiana Miller. Virginia pine

POACEAE
Andropogon scoparius Michaux Little bluestem [*Schizachyrium scoparium* (Michaux) Nash]
Andropogon ternaris Michaux. Beard grass
Andropogon virginicus L. Broom sedge
Danthonia sericea Nuttall. Poverty oat grass
Festuca spp. Fescue
Microstegium vimineum (Trinius) A. Camus. Microstegium
Panicum angustifolium Ell.
Panicum boscii Poiret.
Sorghum halepense (L.) Persoon Johnson grass

POLEMONIACEAE
Phlox carolina L. Phlox
Phlox spp. Wild sweet William

POLYGONACEAE
Polygonum spp. Knotweed

POLYPODIACEAE
Polypodium polypodioides (L.) Watt. Resurrection fern

PTERIDACEAE
Dennstaedtia punctilobula (Michaux) Moore. Hayscented fern
Pteridium aquilinum (L.) Kuhn. Bracken

RANUNCULACEAE
Ranunculus recurvatus Poiret. Buttercup
Thalictrum thalictroides (L.) Boivin. Windflower

Xanthorhiza simplicissima Marshall. Yellow-root

RHAMNACEAE
Ceanothus americanus L. New Jersey tea

ROSACEAE
Amelanchier arborea (Michaux f.) Fernald. Serviceberry
Fragaria virginiana Duchesne. Wild strawberry
Malus anqustifolia (Aiton) Michaux. Crab-apple
Potentilla canadensis L. Cinquefoil
Prunus angustifolia Marshall. Chickasaw plum
Prunus serotina Ehrhart. Black cherry
Rosa carolina L. Wild rose
Rosa multiflora Thunberg. Multiflora rose
Rubus spp. Blackberry
Sambucus canadensis L. Elderberry

RUBIACEAE
Cephalanthus occidentalis L. Button bush
Diodia virginiana L. Diodia
Houstonia caerulea L. Bluets
Mitchella repens L. Partridge berry

SALICACEAE
Salix nigra Marshall. Black willow

SCHROPHULARIACEAE
Agalinis tenuifolia (Vahl) Raf. Gerardia
Aureolaria pedicularia (L.) Raf. Fern-leaved foxglove
Mimulus spp. Monkeyflower

STYRACACEAE
Halesia carolina (*tetraptera*) L. Silverbell

SYMPLOCACEAE
Symploccus tinctorum (L.) L'Her. Horse sugar

ULMACEAE
Ulmus alata Michaux. Winged elm

VERBENACEAE
Callicarpa americana L. Beauty-berry

VIOLACEAE
Viola pedata L. Bird-foot violet
Viola spp. Purple violet

VITACEAE
Parthenocissus quinquefolia (L.) Planchon. Virginia creeper
Vitis baileyana Munson. Possum grape
Vitis rotundifolia Michaux. Muscadine

APPENDIX 6. CROWDERS MOUNTAIN STATE PARK RARE PLANTS LIST[1]

Following is a list of 14 rare or disjunct plant species that have been documented in the park. A detailed botanical survey of the park, especially the area around Kings Pinnacle, still needs to be performed.

STATE LISTED SPECIES

Common Name	Scientific Name	NC Status	NC Rank
Bradley's spleenwort	*Asplenium bradleyi*	NC candidate species	critically imperiled in NC
Ground juniper	*Juniperus communis* var. *depressa*	NC candidate species	critically imperiled in NC
Biltmore carrion-flower	*Smilax biltmoreana*	NC candidate species	critically imperiled in NC
Bear oak	*Quercus ilicifolia*	NC candidate species	critically imperiled in NC
Mountain witch alder	*Fothergilla major*	NC candidate species	imperiled in NC
Appalachian golden-banner	*Thermopsis mollis* var. *mollis*	significantly rare	imperiled in NC
Smooth sunflower	*Helianthus laevigatus*	significantly rare	imperiled in NC
Piedmont indigo bush	*Amorpha schwerinii*	significantly rare	rare or uncommon in NC

REGIONALLY RARE SPECIES

Common Name	Scientific Name	Comment
Mountain spleenwort	*Asplenium montanum*	NC within-state disjunct list (Watch category 6)
Silverling	*Paronychia argyrocoma*	NC within-state disjunct list (Watch category 6)
Carolina rhododendron	*Rhododendron minus* *	NC within-state disjunct list (Watch category 6)
Blazing star	*Liatris regimontis*	disjunct from sandhills/coastal plain pops. (closest Anson Co.)
Mountain highbush blueberry	*Vaccinium constablaei*	disjunct from >4000 ft. elev. mountain pops. (closest Henderson Co.)
Sand myrtle	*Leiophyllum buxifolium* *	disjunct from scattered mountain and coastal plain populations.

* The North Carolina Natural Heritage Program believes that records for the presence of these species at the park need further verification and/or clarification

[1] Nomenclature follows Radford, A.E., H.E. Ahles and C.R. Bell, 1968. Manual of the vascular flora of the Carolinas. The University of North Carolina Press. Chapel Hill, N.C.

APPENDIX 7. DEFINITIONS OF LOCAL, STATE AND GLOBAL STATUS RANKS

North Carolina Status

Endangered, Threatened and Special Concern species of mammals, birds, reptiles, amphibians, freshwater fishes and freshwater terrestrial mollusks have legal protection status in North Carolina (Wildlife Resources Commission).

Status Code	Status	Definition
E	Endangered	"Any native or once-native species of wild animal whose continued existence as a viable component of the State's fauna is determined by the Wildlife Resources Commission to be in jeopardy or any species of wild animal determined to be an 'endangered species' pursuant to the Endangered Species Act" (Article 25 of Chapter 113 of the General Statutes; 1987.)
T	Threatened	"Any native or once-native species of wild animal which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range, or one that is designated as a threatened species pursuant to the Endangered Species Act." (Article 25 of Chapter 113 of the General Statutes; 1987.)
SC	Special Concern	"Any species of wild animal native or once-native to North Carolina which is determined by the Wildlife Resources Commission to require monitoring but which may be taken under regulations adopted under the provisions of this article." Article 25 of Chapter 113 of the General Statutes; 1987.)
SR	Significantly Rare	Any species which has not been listed by the N.C. Wildlife Resources Commission as an endangered, Threatened, or Special Concern species, but which exists in the state in small numbers and has been determined by the N.C. Natural Heritage Program to need monitoring. (This is a N.C. Natural Heritage Program designation.) Significantly rare species include "peripheral" species, whereby North Carolina lies at the periphery of the species' range.
EX	Extirpated	A species which is no longer believed to occur in the state.
W	Watch List	Any other species believed to be of conservation concern in the state because of scarcity, declining populations, threats to populations or inadequacy of information to assess its rarity.
*	---	Species is a game animal, and therefore (by law) cannot be listed for state protection as E, T or SC.
#	---	Species proposed for Endangered status, but not adopted by the Wildlife Resources Commission; species is protected from taking.
@	---	Species proposed for Special Concern status, but not adopted by the Wildlife Resources Commission; species is protected from taking.

United States Status

This status is designated by the U.S. Fish and Wildlife Service. Federally listed Endangered and Threatened species are protected under the provisions of the Endangered Species Act of 1973, as amended through the 100th Congress.

Status Code	Status	Definition
E	Endangered	A taxon "which is in danger of extinction throughout all or a significant portion of its range" (Endangered Species Act, Section 3).
T	Threatened	A taxon "which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. (Endangered Species Act, Section 3).
C	Candidate	"Taxa for which the [U.S. Fish and Wildlife] Service has on file sufficient information on biological vulnerability and threat(s) to support proposals to list them as an endangered or threatened species. Proposal rules have not yet been issued because this action is precluded at present by other listing activity. Development and publication of proposed rule for these taxa are anticipated. The Service encourages State and other Federal agencies as well as other affected parties to give consideration to these taxa in environmental planning." (Federal register, February 28, 1996). Taxa formerly considered as "Category !" are now considered as "Candidate". NOTE: No animal taxon in North Carolina is currently considered as a "Candidate" for Federal Listing.
FSC	(Federal) Species Of Concern [also known as Species at Risk]	"... the Service is discontinuing the designation of Category 2 species Of Concern as candidates in this notice. The Service remains concerned about these species, but further biological research and field study are needed to Species at Risk} resolve the conservation status of these taxa. Many species of concern will be found not to warrant listing, either because they are not threatened or endangered or because they do not qualify as species under the definition in the [Endangered Species] Act. Others may be found to be in greater danger of extinction than some present candidate taxa.
P	Proposed	Species currently proposed, as either endangered or threatened. Species formally proposed receive some protection by law.

North Carolina Rank

Rank	Descriptions
S1	Critically imperiled in North Carolina because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation from North Carolina.
S2	Imperiled in North Carolina because of rarity or because of some factor(s) making it very vulnerable to extirpation from North Carolina.
S3	Rare or uncommon in North Carolina.
S4	Apparently secure in North Carolina, with many occurrences.
S5	Demonstrably secure in North Carolina ad essentially ineradicable under present conditions.
SA	Accidental or casual; one to several records for North Carolina, but the state is outside the normal range of the species.
SH	Of historical occurrence in North Carolina, perhaps not having been verified in the past 20 years, and suspect to be still extant.
SR	Reported from North Carolina, but without persuasive documentation, which would provide a basis for either accepting or rejecting the report.
SX	Apparently extirpated from North Carolina.
SU	Possibly in peril in North Carolina but status uncertain; need more information.
S?	Unranked, or rank uncertain.
_B	Rank of the breeding population in the state. Used for migratory species only.
_N	Rank of the non-breeding population in the state. Used for migratory species only.
_Z_	Population is not of significant conservation concern. For example, the status "SZN" indicated that the population in the non-breeding seasons (generally in migration or in winter) is transitory, without any regular locales of occurrence whereby the species can be protected.

Global Rank

Rank	Description
G1	Critically imperiled globally because of extreme rarity or because of some factor(s) making it especially vulnerable to extinction.
G2	Imperiled globally because of rarity of because of some factor(s) making is very vulnerable to extinction throughout its range.
G3	Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range (e.g., a single physiographic region) or because of other factors making it vulnerable to extinction throughout its range.
G4	Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery.
G5	Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.
GH	Of historical occurrence throughout its range, i.e., formerly part of the established biota, with the expectation that it may be rediscovered.
GX	Believed to be extinct throughout its range (e.g., Passenger Pigeon) with virtually no likelihood that it will be rediscovered.
GU	Possibly in peril range-wide, but status uncertain; more information is needed.
G?	Unranked, or rank uncertain.
G_Q	Questionable taxonomic assignment.
T_	The rank of a subspecies or variety. As an example, G4T1 would apply to a subspecies of a species with an overall rank of G4, but the subspecies warranting a rank.