

**AN INVENTORY OF SIGNIFICANT NATURAL AREAS OF  
CATAWBA COUNTY, NORTH CAROLINA**



by

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with plant data provided by  
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## **ABSTRACT**

This report documents the first systematic inventory of the natural areas of Catawba County, North Carolina. The objectives were to identify and describe the most intact natural communities, including areas that provide important habitat to wildlife. This inventory was unique, because it used birds as ecological indicators to help identify Significant Natural Heritage Areas. Potential sites for survey were initially identified by Foothills Conservancy of North Carolina, with help from Catawba County planners, an advisory committee, and other individuals knowledgeable about the county. Topographic maps and aerial photographs were used to select and prioritize areas for survey. The majority of fieldwork occurred during the spring and early summer of 2001. Eleven sites, encompassing approximately 3,142 acres, were identified as Significant Natural Heritage Areas during this inventory. Seven sites are wooded, riparian corridors along major streams and rivers. The other sites include an extensive mature forest (Baker Mountain), a wetland complex along Lyle Creek, an undeveloped shoreline of Lake Norman, and aquatic habitat in the upper Jacob Fork River. Of the eleven Significant Natural Heritage Areas, Baker Mountain, the Catawba River Corridor, and the Jacob Fork West Corridor should receive priority for protection because of the size and quality of their natural communities, and the critical habitats they provide rare and uncommon species.

## **ACKNOWLEDGMENTS**

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(COVER PHOTO: Baker Mountain)

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## **INTRODUCTION**

### **OBJECTIVES**

Objectives of the inventory were to identify and describe the Significant Natural Heritage Areas (SNHAs) in Catawba County. Areas were considered significant if they: 1) contained natural communities as defined by Schafale and Weakley (1990), 2) provided habitats for rare, threatened, and endangered (RT&E) species, or 3) included other significant ecological attributes such as high quality wildlife habitat. Agricultural lands in Catawba County are known to provide important habitats for many species of plants and animals. Some of the larger agricultural lands in the county were evaluated as potential sites, but were determined not to have natural heritage significance. Because of funding constraints a thorough evaluation of agricultural lands in the county was not possible.

It is important that significant natural heritage areas be identified so that efforts can be made to protect them. They are reservoirs for native biodiversity and contain habitats that are critical for the survival of many RT&E species. The increase in land development throughout the state and the county threatens the integrity of many significant natural heritage areas. Therefore, identification and protection of these areas is crucial. Protection can be in many forms, including voluntary conservation agreements with landowners, or landowner participation in state and federal programs such as those administered by the United States Department of Agriculture or County Soil and Water Conservation District for protection of riparian zones. Using the conservation easement as a tool, non-profit private land trusts like the Foothills Conservancy and willing landowners can achieve binding and permanent protection of natural heritage areas.

### **METHODS**

Methods for this inventory followed the guidelines set forth by the North Carolina Natural Heritage Program (NC NHP). This inventory was somewhat unique because its scope included areas that were thought to contain significant wildlife habitats. In addition, this was one of the few inventories to use birds as ecological indicators to help identify SNHAs. Faunal surveys and habitat assessments were conducted by C. Reed Rossell, Jr., Certified Wildlife Biologist, Asheville, NC. Floral surveys and community assessments were conducted by Jeff Levi, Botanist, Environmental Assessment and Planning, Asheville, NC.

Potential sites for natural heritage surveys were identified by an advisory committee with the assistance of Tom Kenney at the Foothills Conservancy of North Carolina, staff of the NC NHP, county planners, and other knowledgeable individuals in the county. The largest tracts of forested lands, and other lands with unique attributes, such as known locations of RT&E species, were identified using county-based maps and a Geographic Information System (GIS). Topographic maps and aerial photographs were then used to select and prioritize areas to be surveyed. Surveys were conducted only on lands where permission was obtained; thus, some significant areas may not have been evaluated because of lack of landowner consent. Most faunal surveys were carried out during the spring of 2001, when birds were the most active,

establishing and defending territories. Every effort was made to standardize bird surveys. Surveys of most significant areas were conducted in the mornings from sunrise until 11:00 a.m. However, due to time constraints, some surveys were conducted in the afternoon. Bird surveys consisted of recording each species heard or seen while visiting a site. Other animals that were observed, or that had left signs such as tracks and scat, also were recorded during site visits. Weather was consistent throughout the field season, with moderately warm temperatures and little precipitation. Floral surveys and community assessments were conducted from late spring to early fall of 2001. Floral surveys consisted of walking the sites and documenting the species present.

Significant Natural Heritage Areas were determined after all site surveys were conducted and the results reviewed by both biologists. Boundaries were delineated using topographic maps and aerial photographs. The size of each area was estimated using GIS.

For each Significant Natural Heritage Area, a standard Site Survey Report was completed and sent to the NC NHP. These reports included a detailed account of each natural community within a site, all known and potential occurrences of RT&E species, a faunal list, and general information on aquatic and wildlife habitats. Each area also was ranked according to its biological importance, using criteria developed by the NC NHP and The Nature Conservancy. Ranks were County, Regional, State, or National, and based on the rarity of species and natural features present at a site. The criteria used for site significance are:

**National Significance:** Considered to contain examples of natural communities, rare plant or animal populations, or other significant ecological features that are among the highest quality or best of their kind in the nation.

**State Significance:** Considered to contain examples of natural communities, rare plant or animal populations, or other significant ecological features that are among the highest quality occurrences in North Carolina after nationally significant examples. There may be comparable (or more significant) sites elsewhere in the nation or within the state.

**Regional Significance:** These sites contain communities or species that are represented elsewhere in the state by better quality examples, but which are among the outstanding examples in their geographic region of the state. Normally, the geographic region considered includes at least the counties immediately surrounding the county the site is located in.

**County Significance:** Sites that do not rank of regional significance, but which are significant biological resources at the county level. These may include sites with a good example of a fairly common community type, a species that is rare in the state but widespread in other parts of the nation or in neighboring states, or a site that has been greatly reduced from its original quality but which still has significance.

## DESCRIPTION OF THE STUDY AREA

## **STUDY AREA**

Catawba County is located in west-central North Carolina. It is bordered by Burke County to the west; by Caldwell, Alexander, and Iredell Counties to the north; by Iredell County to the east; and Lincoln County to the south (Figure 1). The Catawba River forms the county's north and east boundaries. Newton, the county seat, is 180 miles west of Raleigh and 55 miles northwest of Charlotte. Hickory is the largest city in the county and is about 10 miles northwest of Newton (Figure 2).

Catawba County has a relatively small, but growing population. As of 2000, it had about 142,000 residents, an increase of almost 20% from 1990 (U.S. Census Bureau 2000). The county is industrially oriented, but has a large agricultural component, with approximately 43% (112,894 acres) of its lands in agricultural production (CGIA 1996). Forty-eight percent (127,235 acres) of its lands are forested. The majority of forests, however, are fragmented and disturbed from past logging and agricultural uses.

## **TOPOGRAPHY AND PHYSIOGRAPHY**

Catawba County is in the Upland Section of the Piedmont Province, located on the eastern boundary of the western Piedmont Region. Elevations in the county range from 760 feet along the Catawba River to 1,812 feet at Baker Mountain. The average elevation is 1,165 feet (U.S. Soil Survey 1975). Topography is generally flat to gently rolling, with two distinct monadnocks, Baker Mountain (1,812 feet) in the western portion of the county, and Anderson Mountain (1,547 feet) in the eastern portion of the county. The western portion of the county tends to be more rugged and mountainous than the eastern portion and is associated with the South Mountains in Burke County. Streams and rivers are generally slow flowing and meandering, with sand and gravel bottoms. The Catawba River is the largest river in the county and is regulated by a series of dams; the river comprises Lake Hickory, Lookout Shoals Lake, and Lake Norman (Figure 3).

## **GEOLOGY AND SOILS**

Erosion has greatly altered the topography of Catawba County (U.S. Soil Survey 1975). In most places a thick layer of soil and soft weathered rock overlie bedrock. Three metamorphic rock types account for the majority of bedrock in Catawba County (Geologic Map of North Carolina 1985). Amphibolite and Biotite Gneiss make up at least 30-40% of the rock in the central portion of the county. Mica Schist predominates in the eastern and western portions of the county, and Biotite Gneiss and Schist predominate in the northern portion of the county. These rock types are relatively common in the Piedmont and generally weather into more acidic soils, with the exception of amphibolite, which weathers into more basic soils (U.S. Soil Survey 1975).

Soil formation occurs mostly as a result of the disintegration and weathering of bedrock over geologic time. Most of the soils in the county are acidic and strongly leached of nutrients. They

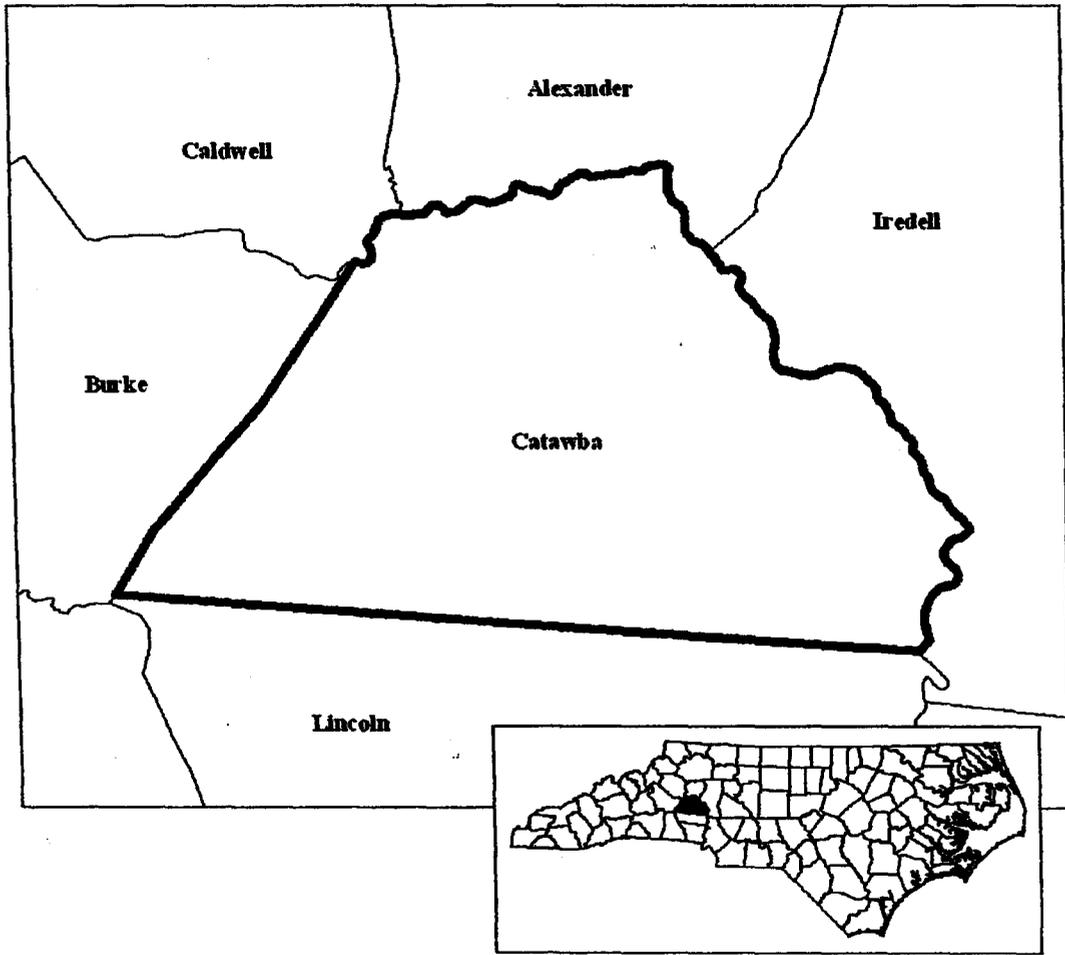


Figure 1. Location of Catawba County relative to surrounding counties.

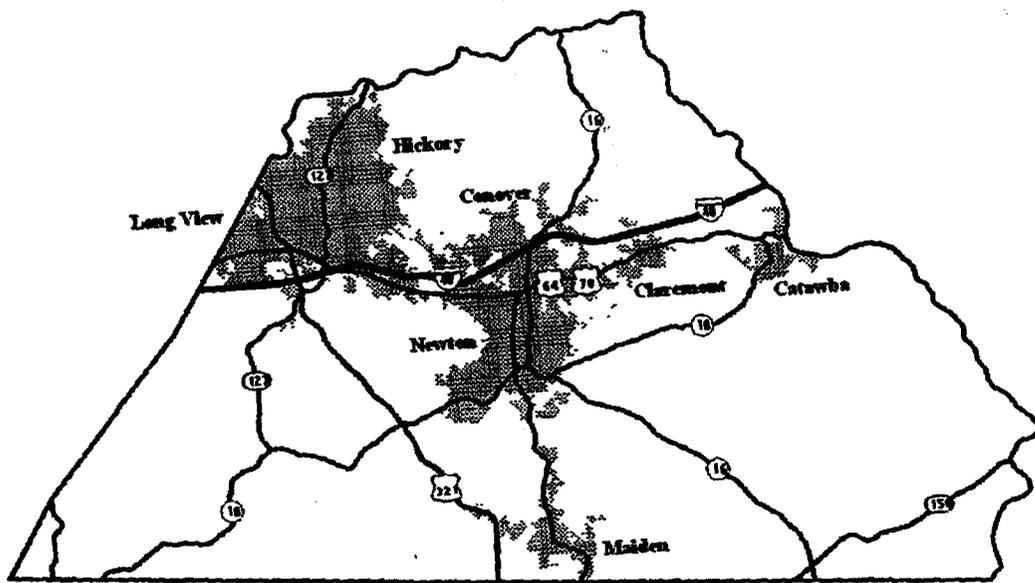


Figure 2. Towns and roads in Catawba County, NC.



generally are classed as sandy loams, with low to moderate fertility, and require fertilizer and lime for optimum plant growth (U.S. Soil Survey 1975). Areas overlain by amphibolite often are preferred by many rare and uncommon plant species (S. Oakley, NC NHP, pers. comm.).

## **PAST LAND USES**

Colonial settlement of the county began about 1747 (U.S. Soil Survey 1975). Since then most of the forests have been repeatedly disturbed. Nearly all the tillable land has been cleared at one time or another and farmed (U.S. Soil Survey 1975). Shortleaf (*Pinus echinata*) and Virginia Pine (*P. virginiana*) invaded many fields after abandonment because of poor soil fertility. Many of these second-growth pine stands also have been cut, with the lands returned to agricultural production or left to naturally regenerate (U.S. Soil Survey 1975). As a result, the majority of forested lands today are young stands of pine or mixed pine/hardwoods, less than 100 acres in size.

## **THE BIODIVERSITY OF CATAWBA COUNTY**

### **NATURAL AREAS**

Eleven sites, encompassing approximately 3,142 acres, were determined to be Significant Natural Heritage Areas during this inventory (Table 1 and Figure 4). The size of the areas range from 12 acres (Lyle Creek Wetland) to 1,176 acres (Baker Mountain). Seven of the sites are wooded, riparian corridors along major streams and rivers. The other sites include a large tract of mature forest (Baker Mountain), a wetland complex adjacent to Lyle Creek, and an undeveloped shoreline along Lake Norman. All the riparian corridors along rivers and streams are disturbed to some degree, but are considered significant, because they provide important habitats for many species of conservation concern. An additional SNHA in this report is the Jacob Fork Aquatic Habitat. This regionally significant aquatic site was previously determined a SNHA by the NC NHP.

Of the ten terrestrial areas identified during this inventory, one was ranked nationally significant, one state significant, three regionally significant, and five county significant. The Jacob Fork West Corridor was considered nationally significant, because it incorporated the Catawba County Wildlife Club Heartleaf Site. This site is a registered Natural Heritage Area and contains an extremely large population (> 1000 individuals) of the federally threatened dwarf-flowered heartleaf (*Hexastylis naniflora*). Baker Mountain was determined state significant because of the diversity, size, and quality of its natural communities, and the large number of rare species the site contains. The Catawba River Corridor, Lyle Creek Corridor, and Murray's Mill Lake and Upper Balls Creek were ranked regionally significant, because they provide habitats for a diversity of plants and animals, including several species that are federally listed (see Site Descriptions for occurrence of rare and notable species at each site). The Henry Fork River Slopes, Jacob Fork East Corridor, Lyle Creek Wetland, Terrapin Creek Corridor, and Lake Norman Slopes and Shoreline were all considered county significant, because they contain relatively intact natural

communities and provide habitats for many uncommon species. A list of animals observed at each SNHA is provided in Appendix V.

Table 1. Significant Natural Heritage Areas in Catawba County, NC.

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<u>Significant Natural Heritage Area</u>	<u>Significance Rank</u>
Henry Fork River Slopes	County
Baker Mountain	State
Jacob Fork Aquatic Habitat	Regional
Jacob Fork West Corridor	National
Jacob Fork East Corridor	County
Catawba River Corridor	Regional
Lyle Creek Corridor	Regional
Lyle Creek Wetland	County
Murray’s Mill Lake and Upper Balls Creek	Regional
Terrapin Creek Corridor	County
Lake Norman Slopes and Shoreline	County

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## NATURAL COMMUNITIES

Natural communities are distinct and naturally occurring assemblages of plants, animals, bacteria, and fungi associated with a physical environment (The Nature Conservancy 1981). They may be characterized by a variety of features, including flora and fauna, topography, hydrology, soils, and other abiotic attributes (Schafale and Weakley 1990). Natural communities are shaped by the processes of evolution and ecological interactions, and not by disturbances from human activities (Schafale and Weakley 1990). Thus, communities that have evolved from human intervention, such as loblolly pine (*Pinus taeda*) plantations, are not considered natural.

Twelve types of natural communities were identified in Catawba County (Table 2). Names and classifications follow Schafale and Weakley (1990). Six communities in the county have been documented as Element Occurrence Records (EOR) with NC NHP prior to this inventory. These EORs represent rare or exemplary occurrences of common community types. Baker Mountain contained five EORs, including a Mesic Mixed Hardwood Forest (Piedmont Subtype), a Pine-Oak-Heath Forest, a Chestnut Oak Forest, a Dry Oak-Hickory Forest, and a Low Elevation Seep. The Jacob Fork West Corridor contained an EOR for a Dry-Mesic Oak-Hickory Forest.

- 1) Henry Fork River Slopes
- 2) Baker Mountain
- 3) Jacob Fork Aquatic Habitat
- 4) Jacob Fork West Corridor
- 5) Jacob Fork East Corridor
- 6) Catawba River Corridor
- 7) Lyle Creek Corridor
- 8) Lyle Creek Wetland
- 9) Murray's Mill Lake and  
Upper Balls Creek
- 10) Terrapin Creek Corridor
- 11) Lake Norman Slopes  
and Shoreline

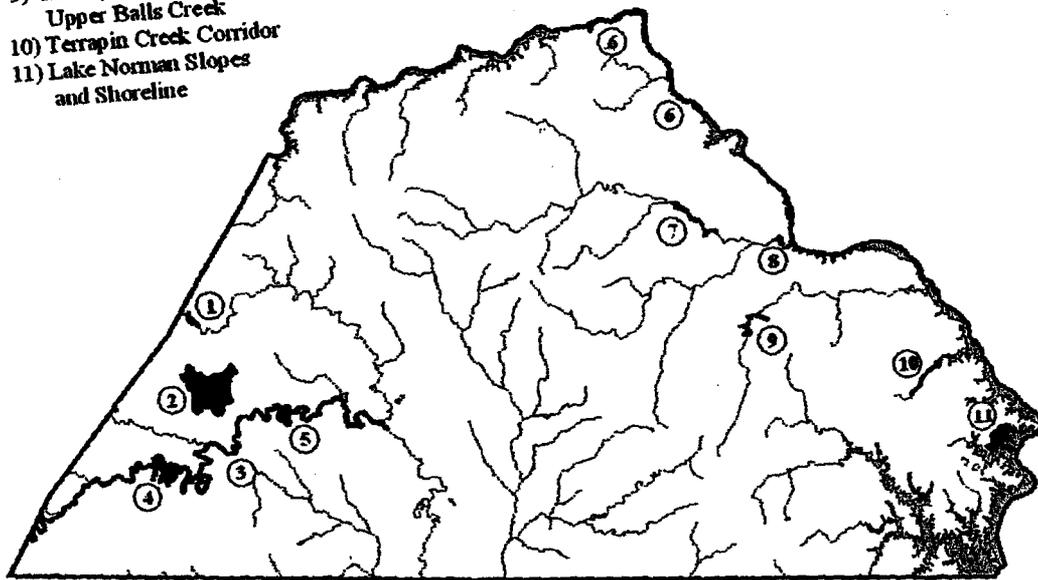


Figure 4. Significant Natural Heritage Areas in Catawba County, NC.

Table 2. Ecological classification with state and global ranks of natural communities in Catawba County, NC.

Natural Community	Rank	
	NC	Global
<u>Low Elevation Mesic Forests</u>		
Mesic Mixed Hardwood Forest (Piedmont Subtype)	S4	G5T5 <sup>1</sup>
<u>Low Elevation Dry and Dry-Mesic Forests and Woodlands</u>		
White Pine Forest	S2?	G?
Pine-Oak-Heath	S4	G5
Chestnut Oak Forest	S5	G5
Dry Oak-Hickory Forest	S4	G5
Dry-Mesic Oak-Hickory Forest	S5	G5
<u>River Floodplains</u>		
Piedmont/Mountain Levee Forest	S3?	G5
Piedmont/Mountain Swamp Forest	S1	G2
Piedmont/Mountain Bottomland Forest	S3?	G5
Piedmont/Mountain Semipermanent Impoundment	S4	G5
Piedmont/Low Mountain Alluvial Forest	S5	G5
<u>Nonalluvial Wetlands of the Mountains and Piedmont</u>		
Low Elevation Seep	S3	G4?

<sup>1</sup> T rank indicates rank for the subtype.

<sup>2</sup> Explanations of state and global ranks are provided in Appendix I.

## RARE PLANT SPECIES

Six rare plant species have been identified in Catawba County (Table 2); all have at least one population at Baker Mountain. Three species, dwarf-flowered heartleaf (*Hexastylis naniflora*), Appalachian golden-banner (*Thermopsis mollis*; sensu stricto), and sweet pinesap (*Monotropsis odorata*), have been documented in other areas of the county as well. Thirteen populations of dwarf-flowered heartleaf have been documented. This species is federally threatened and inhabits rich deciduous forests, bluffs, and ravines (Amoroso 1999). Several populations of Appalachian golden-banner have been identified near Hickory and Newton. This species is significantly rare and thrives on dry ridges and open woodlands (Amoroso 1999). Sweet pinesap has been documented near Hickory. It is a candidate for state listing and is a federal species of concern. It occurs in dry forests and bluffs (Amoroso 1999).

Three rare plant species occur only at Baker Mountain: shiny meadowsweet (*Spiraea betulifolia*

ssp. *corymbosa*), Piedmont indigo bush (*Amorpha schwerinii*), and Biltmore carrion-flower (*Smilax biltmoreana*). Shiny meadowsweet and Piedmont indigo bush are listed as significantly rare in the state, and Biltmore carrion-flower is a candidate for state listing. Shiny meadowsweet is found in open woodlands, with thin soils overlain by rock. Piedmont indigo bush inhabits dry forests, and Biltmore carrion-flower occurs in more mesic forests on felsic or mafic rocks (Amoroso 1999).

Table 3. Rare plants of Catawba County, NC.

Scientific Name Common Name	Status <sup>1</sup>		Rank <sup>1</sup>	
	NC	US	NC	Global
<u>Vascular Plants</u>				
<i>Hexastylis naniflora</i> Dwarfed-flowered Heartleaf	E/PT	T	S2	G2
<i>Thermopsis mollis</i> (sensu stricto) Appalachian Golden-banner	SR	-	S2	G3G4Q
<i>Monotropsis odorata</i> Sweet Pinesap	C	FSC	S3	G3
<i>Spiraea betulifolia</i> ssp. <i>Corymbosa</i> Shiny Meadowsweet	SR	-	S1	G4G5T4
<i>Amorpha schwerinii</i> Piedmont Indigo Bush	SR	-	S3	G3
<i>Smilax biltmoreana</i> Biltmore Carrion-flower	C	-	S3	G3

<sup>1</sup> Definitions of plant status and rank codes are provided in Appendix II.

## RARE ANIMAL SPECIES

Ten rare animal species have been documented in Catawba County (Table 3). These include three insects, one crustacean, one mollusk, two fish, two birds, and one mammal. The Bald Eagle (*Haliaeetus leucocephalus*) and the eastern woodrat (*Neotoma floridana haematoreia*) were two new species added to the list during this inventory. Both species occurred in the Catawba River Corridor.

The three rare insects in the county are mayflies. These insects breed in streams and are general indicators of good water quality. The Cahaba sand-filtering mayfly (*Homoeoneuria cahabensis*) has been found only in the South Fork of the Catawba River. *Acerpenna macdunnoughi* and *Baetisca laurentina* occur only in Maiden Creek and the Jacob Fork River, respectively. All three species are significantly rare in North Carolina (LeGrand and Hall 1999).

The Catawba crayfish ostracod (*Dactylocythere isabelae*) is the only rare crustacean documented in the county. This species is listed as significantly rare in the state and is a federal species of concern (LeGrand and Hall 1999). It has been identified in only one location, along a tributary of Lyle Creek.

The only rare mollusk documented in the county is the dwarf threetooth (*Triodopsis fulciden*). This land snail is listed as a species of concern in the state (LeGrand and Hall 1999). It is apparently endemic to Catawba, Burke, Cleveland, and Lincoln Counties (A. Bogan, NCMNS, pers. comm.). One individual was found in a stand of oaks (*Quercus* spp.) near Conover.

The highfin carpsucker (*Carpionodes velifer*) and the Santee chub (*Cyprinella zanema*) are the two rare fish in the county. The highfin carpsucker is listed as a species of concern in the state (LeGrand and Hall 1999). It has been documented in several locations in Lake Norman. This species prefers clean water and firm substrates in large streams and reservoirs (Menhinick 1997a). The Santee chub is listed as significantly rare in the state (LeGrand and Hall 1999). It has been found in both the Jacob Fork and Catawba River. It generally occurs in pools over sandy substrates, and often schools near stumps or other cover (Menhinick 1997b).

Only two rare bird species have been documented in the county: the Bald Eagle and the Loggerhead Shrike (*Lanius l. ludovicianus*). The Bald Eagle is currently listed as endangered in the state and is federally threatened (LeGrand and Hall 1999). Because its numbers have been increasing throughout its range, the Bald Eagle has been proposed for delisting. A pair of adults was observed during the spring of 2001 in the Lookout Shoals area of the Catawba River. No nest was located. The Loggerhead Shrike is a species of special concern in the state (LeGrand and Hall 1999). It occurs in the northern portion of the county in unimproved pastures (H. LeGrand, NC NHP, pers. comm.). It prefers open habitats with scattered trees and shrubs for nesting and perching (Hamel 1992).

The eastern woodrat is the only rare mammal documented in the county. It is a federal species of concern (LeGrand and Hall 1999). It generally prefers deciduous forests, and is often associated with talus slopes and rocky outcrops in the mountains and foothills of the Carolinas (Webster et al. 1985). An active cache site (a place where food is stored) was identified in a rock complex on the edge of the floodplain of the Catawba River. This is the first record of this species in Catawba County and represents an eastern extension of the species' range in North Carolina.

Table 3. Rare animals of Catawba County, NC.

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Scientific Name Common Name	Status <sup>1</sup>		Rank <sup>1</sup>	
	NC	US	NC	Global
<u>Insects</u>				
<i>Homoeoneuria cahabensis</i> Cahaba Sand-filtering Mayfly	SR	-	S1S2	G1G3
<i>Acerpenna macdunnoughi</i> A Mayfly	SR	-	S2S3	G?
<i>Baetisca laurentina</i> A Mayfly	SR	-	SU	G?
<u>Crustaceans</u>				
<i>Dactylocythere isabelae</i> Catawba Crayfish Ostracod	SR	FSC	S1?	G?
<u>Mollusks</u>				
<i>Triodopsis fulciden</i> Dwarf Threetooth	SC	-	S2	G2
<u>Freshwater Fish</u>				
<i>Carpiodes velifer</i> Highfin Carpsucker	SC	-	S2	G4G5
<i>Cyprinella zanema</i> (pop1) Santee Chub	SR	-	S3	G3T3Q
<u>Birds</u>				
<i>Haliaeetus leucocephalus</i> Bald Eagle	E (PT)	T (PD)	S3B,S3N	G4
<i>Lanius l. ludovicianus</i> Loggerhead Shrike	SC	-	S3B,S3NG5T5	
<u>Mammals</u>				
<i>Neotoma floridana haematoreia</i> Eastern Woodrat	SC	FSC	S2S3	G5T4Q

<sup>1</sup> Definitions of animal status and rank codes are provided in Appendix III.

## **DISCUSSION**

The flora and fauna of Catawba County are typical of agricultural-based areas in the western Piedmont. Some areas, with large elevation gradients and steep topography, contain plant and animal communities that resemble those more typical of the mountains, but these are relatively rare. The greatest species diversity in the county is associated with riparian corridors, agricultural lands, and edge habitats (e.g., areas between fields and forests). Only a few large tracts of mature forests or wetlands remain in the county. As a result, species associated with these habitats are generally uncommon and in the greatest need of conservation.

Relatively few high quality natural communities or rare plants or animals have been documented in Catawba County. This may reflect disturbance from past and current land practices. It also may reflect the time spent surveying for rare species in the county. Most of the rare animals in the county, with the exception of the dwarf threetooth snail and the Loggerhead Shrike, are associated to some extent with aquatic habitats and/or riparian corridors. This emphasizes the importance of riparian corridors for providing wildlife habitat and protecting the water quality of the streams and rivers.

Many species of freshwater mussels are considered biomonitors of aquatic ecosystem health (Nedeau et al. 2000). In Catawba County, there seems to be a lack of freshwater mussels (C. McGrath, NCWRC, pers. comm.). This suggests that the aquatic habitats in the county may be degraded to the point where freshwater mussels cannot survive. Only two native species of freshwater mussels were found during the inventory, and both occurred in the waters below Murray's Mill dam in upper Balls Creek. This section of Balls Creek appeared to have the best water quality of any in the inventory. Observations of the major streams and rivers in the county indicated that all have sedimentation problems. Even two of the most outstanding SNHAs (see section below), the Catawba River Corridor and Jacob Fork West Corridor, have problems with agricultural runoff and cows entering the water and disturbing banks.

## **PROTECTION PRIORITIES AND RECOMMENDATIONS**

Three Significant Natural Heritage Areas should receive priority for protection. They are listed below in the order of importance, with a brief description of their attributes, followed by general recommendations for management and protection.

### **Baker Mountain**

This site is the largest expanse of undisturbed forests in the county. It contains a diversity of high quality natural communities and provides habitats for populations of all rare plant species documented in the county. Baker Mountain also provides breeding habitat for a unique avian fauna, including many species that are uncommon in the county and the Piedmont such as Ruffed Grouse (*Bonasa umbellus*), Wood Thrush (*Hylocichla mustelina*), and Black-throated Green Warbler (*Dendroica virens*; see Site Description for species list).

Management should include trail maintenance, as many of the trails have serious erosion

problems. Motorized vehicles should be prohibited from the forests because of erosion concerns. A hands-off forest management policy should be considered to minimize costs and to allow the forests to mature. Development within the site should be kept to a minimum. Rare plant populations should be monitored periodically. The entire area needs to be protected either with conservation easements or purchase by the state or county. This site would make an excellent state park, expanded county park, or wildlife preserve. Efforts should be made to obtain easements to connect this site to the Jacob Fork River.

### **Catawba River Corridor**

This site is the most extensive riparian corridor along the Catawba River in the county. It provides important habitat for many species of wildlife that are uncommon in the county and the Piedmont, including two federally listed species: the Bald Eagle and the eastern woodrat. This site contains the richest avian fauna (63 species recorded; Appendix VI) of any of the SNHAs in the county. It also includes Riverbend County Park, with a small pond and wetland, which adds to the diversity of habitats along the river.

Management should include excluding cows from the river and restoring disturbed banks with native vegetation. Adequate vegetation buffers should be established around agricultural fields adjacent to the river to reduce sediment in the river. The riparian zone along both sides of the river needs to be widened and protected to improve and enhance wildlife habitat, to maintain a forested corridor, and to increase water quality. Protection should include all slopes above the river, particularly those near the woodrat site, and could be in the form of conservation easements. Forests should be managed for older growth and natural forest conditions. The conservation value of this site would be enhanced if the adjacent upland forests also were protected.

### **Jacob Fork West Corridor**

This site is nationally significant because of the incorporation of the Catawba County Wildlife Club Heartleaf Site. The riparian corridor is probably the least disturbed in the county. The area contains a diversity of aquatic and terrestrial habitats, including some with montane features. Many species utilize the area for breeding and foraging, including the uncommon Gulf Coast spiny softshell (*Apalone spinifera aspera*; NC NHP Animal Watchlist, LeGrand and Hall 1999) and the Baltimore Oriole (*Icterus galbula*; NC NHP Animal Watchlist, LeGrand and Hall 1999). Some large tracts of intact forests also are contained within this site, providing breeding habitats for many uncommon bird species associated with forest-interior conditions. This site also protects the water quality of the Jacob Fork Aquatic Habitat.

Management should include excluding cows from the river and restoring disturbed banks with native vegetation. Adequate vegetation buffers should be established around agricultural fields to reduce sediment loads in the river. All forests should be allowed to mature. The riparian zone along the river should receive first priority for protection. Second priority should be given to the slopes and upland forests. Protection could be in the form of conservation easements. The Catawba County Wildlife Club Heartleaf Site is currently protected as a Registered Natural Heritage Area. In the future, more permanent protection of this site could be achieved with a

conservation easement.

### **AREAS FOR FURTHER SURVEY WORK**

Additional floral and faunal surveys are suggested at each of the SNHAs. A large proportion of field time was spent on reconnaissance of lands to be surveyed. As a result, only a limited amount of time was dedicated to detailed surveys at each Natural Heritage Area. The majority of floral surveys were conducted during the late spring and summer. Therefore, early spring surveys are needed to document early flowering species. Specific surveys are also recommended for dwarf-flowered heartleaf (an early flowering species) and the eastern woodrat. Areas with potential woodrat habitats include the Catawba River Corridor and Baker Mountain. There is also potential for remnant roadside populations of rare plant species because of the abundance of rocks containing amphibolite in Catawba County.

## REFERENCES

- Amoroso, J. L. 1999. Natural Heritage Program List of the Rare Plant Species of North Carolina. N.C. Natural Heritage Program, DPR, DENR, Raleigh, NC.
- CGIA. 1996. Statewide Land Cover Map Layer. North Carolina Center for Geographic Information Analysis. Raleigh, NC.
- Geologic Map of North Carolina 1985. Department of Natural Resources and Community Development, Raleigh, NC.
- Hamel, P. B. 1992. The Land Manager's Guide to the Birds of the South. The Nature Conservancy, Southeastern Region, Chapel Hill, NC.
- LeGrand, H. E., Jr., and S. P. Hall. 1999. Natural Heritage Program List of the Rare Animal Species of North Carolina. N.C. Natural Heritage Program, DPR, DENR, Raleigh, NC.
- Menhinick, E. F. 1997a. *Carpoides velifer*, Highfin Carpsucker. Pp. 44-45 *In* Endangered, Threatened, and Rare Fauna of North Carolina. Part IV. A Reevaluation of the Freshwater Fishes. Occasional Papers of the NC Museum of Natural Sciences and the NC Biological Survey. No. 11.
- Menhinick, E. F. 1997b. *Cyprinella* (= *Hybopsis*) *zanema* form, Thinlip Chub. Pp. 50 *In* Endangered, Threatened, and Rare Fauna of North Carolina. Part IV. A Reevaluation of the Freshwater Fishes. Occasional Papers of the NC Museum of Natural Sciences and the NC Biological Survey. No. 11.
- Nedeau, E. J., M. A. McCollough, and B. I. Swartz. 2000. The Freshwater Mussels of Maine. Maine Department of Inland Fisheries and Wildlife, Augusta, ME.
- Schafale, M. P., and A. S. Weakley. 1990. Classification of the Natural Communities of North Carolina. Third Approximation. N.C. Natural Heritage Program, DPR, DENR, Raleigh, NC.
- The Nature Conservancy. 1981. Natural Heritage Program Model Operations Manual. Sect. 3.7.
- U.S. Census Bureau. 2000. Census of population: 2000. Number of inhabitants, North Carolina. U.S. Department of Commerce.
- U.S. Soil Survey. 1975. Soil Survey of Catawba County, North Carolina. U.S. Department of Agriculture, Washington, D.C.
- Webster, W. M., J. F. Parnell, and W. C. Briggs, Jr. 1985. Mammals of the Carolinas, Virginia,

and Maryland. University of North Carolina Press, Chapel Hill, NC.

## SITE DESCRIPTIONS

This section contains descriptions of the eleven sites determined to be Significant Natural Heritage Areas in Catawba County. The order of the sites in this report is based on their location in the County and generally follows a west to east direction (Figure 4). Site descriptions include the following:

**MAP:** a USGS topographic quadrangle map with site boundaries. Scale is 1:24,000.

**SITE NAME:** name assigned to the site by the NC NHP.

**SITE SIGNIFICANCE:** rated National, Statewide, Regional, or County.

**SIZE:** indicates the size of the site in acres. Sizes were estimated using GIS.

**QUADRANGLE:** indicates which USGS topographic map(s) the site occurs.

**OWNERSHIP:** indicates whether the site is publicly or privately owned.

**SIGNIFICANT FEATURES:** lists the most important features of the site. This information reflects the reasoning behind the significance rank.

**GENERAL DESCRIPTION:** describes the site in terms of the plant and animal communities and their relationship with the surrounding landscape. Other relevant features such as the presence of RT&E species, or quality of aquatic habitats, or levels of disturbance are also discussed.

**MANAGEMENT AND PROTECTION:** describes potential threats to a site and provides recommendations for management and protection.

**RARE AND NOTEWORTHY PLANTS:** lists all documented rare and uncommon plants. Refer to Amoroso (1999) for information on NC NHP Watchlist species.

**RARE AND NOTEWORTHY ANIMALS:** lists all documented rare and uncommon animals.

Refer to LeGrand and Hall (1999) for information on NC NHP Watchlist species.

**REFERENCES:** lists literature and reports specific to the site.

\* Names of natural community types correspond to those in Classification of the Natural Communities of North Carolina: Third Approximation (Schafale and Weakley, 1990).

## Catawba County Natural Area Inventory

### HENRY FORK RIVER SLOPES Significant Natural Heritage Area

**Site Significance:** County  
**Quadrangles:** Longview

**Size:** 39 acres  
**Ownership:** Private

**SIGNIFICANT FEATURES:** This is one of the few intact riparian corridors along the Henry Fork River in Catawba County. The site contains a fair quality Mesic Mixed Hardwood Forest (Piedmont Subtype) and a north-facing rocky slope. The site provides habitat for several neotropical migrant bird species associated with forest-interior conditions, including the Ruby-throated Hummingbird (*Archilochus colubris*), Blue-gray Gnatcatcher (*Poliptila caerulea*), Acadian Flycatcher (*Empidonax virescens*), American Redstart (*Setophaga ruticilla*), and Northern Parula (*Parula americana*).

**GENERAL DESCRIPTION:** The site consists of a small section of forested bottomlands and slopes along both sides of the Henry Fork River. The south side of the river contains a rocky slope and mesic forests with some montane characteristics, including species such as white pine (*Pinus strobus*), eastern hemlock (*Tsuga canadensis*), rhododendron (*Rhododendron maximum*), and mountain laurel (*Kalmia latifolia*). A young, second-growth alluvial/floodplain forest occurs along the north side of the river, with some portions disturbed from logging and dominated by dense areas of pine (*Pinus* spp.)

The waters of this section of the Henry Fork are class C (waters protected for activities where human body contact is infrequent; waters were rated by NC Division of Water Quality in 1962). The river is generally slow flowing through the site, except for one stretch that flows over a small rocky shoal, that produces a nice run of rapids and faster flowing water. Disturbance of the banks and riparian zone is moderate, with most of it occurring on the north side of the river.

Slopes on the north side of the river have been logged and are dominated by Pine. Slopes on the south side of the river are relatively intact and support a fair quality Mesic Mixed Hardwood Forest (Piedmont Subtype). This forest has a canopy of American beech (*Fagus grandifolia*), red oak (*Quercus rubra*), yellow poplar (*Liriodendron tulipifera*), red maple (*Acer rubrum*), white pine, and eastern hemlock. River birch (*Betula nigra*) occurs at the base of the slope. The understory consists of black gum (*Nyssa sylvatica*), sourwood (*Oxydendrum arboreum*), bigleaf snowbell (*Styrax grandifolia*), and American hazelnut (*Corylus americana*). Shrub species include mountain laurel, rhododendron, a non-native privet (*Ligustrum sinense*), horse sugar (*Symplocos tinctoria*), witch-hazel (*Hamamelis virginiana*), mapleleaf viburnum (*Viburnum acerifolium*), umbrella tree (*Magnolia tripetala*), and yellow root (*Xanthorhiza simplicissima*). Herbs include running cedar (*L. flabelliforme*), royal fern (*Osmunda regalis* var. *spectabilis*), heartleaf (*Hexastylis* sp.), crane-fly orchid (*Tipularia discolor*), and galax (*Galax aphylla*). There also is the potential for the occurrence of the federally threatened, dwarf-flowered heartleaf (*Hexastylis naniflora*).

Faunal surveys were conducted during an overcast and rainy day, which likely resulted in a limited species list for the site. The site provides habitat (probably breeding) for several neotropical migrant bird species associated with forest-interior conditions, including the Ruby-throated Hummingbird, Acadian Flycatcher, Blue-gray Gnatcatcher, American Redstart, and Northern Parula.

**MANAGEMENT AND PROTECTION:** ATV use should be confined to existing trails along the river. Protection is needed for the entire riparian corridor along the Henry Fork River. Vegetation buffers need to be established along the banks of the river to protect the quality of the water and to reduce siltation of the river. All forests within the site should be allowed to mature.

The riparian corridor and slopes along the river could be protected through conservation easements. Protection of disturbed upland forests, not included in the boundaries of the site, would enhance the habitat for species requiring forest-interior conditions.

**RARE AND NOTEWORTHY PLANTS:**

Bigleaf Snowbell (*Styrax grandifolia*). Relatively uncommon in the Piedmont.

**RARE AND NOTEWORTHY ANIMALS:**

Acadian Flycatcher (*Empidonax vireescens*), Forest-interior species. Probably breeding.

Generally associated with streams and bottomland forests.

Northern Parula (*Parula americana*), Forest-interior species. Relatively uncommon in Catawba County. Possibly breeding or late migrant. One recorded near south end of site. Generally associated with streams and bottomland forests.

American Redstart (*Setophaga ruticilla*), Forest-interior species. Relatively uncommon in Catawba County. Possibly breeding or late migrant. Generally associated with open woodlands and water.

**REFERENCES:**

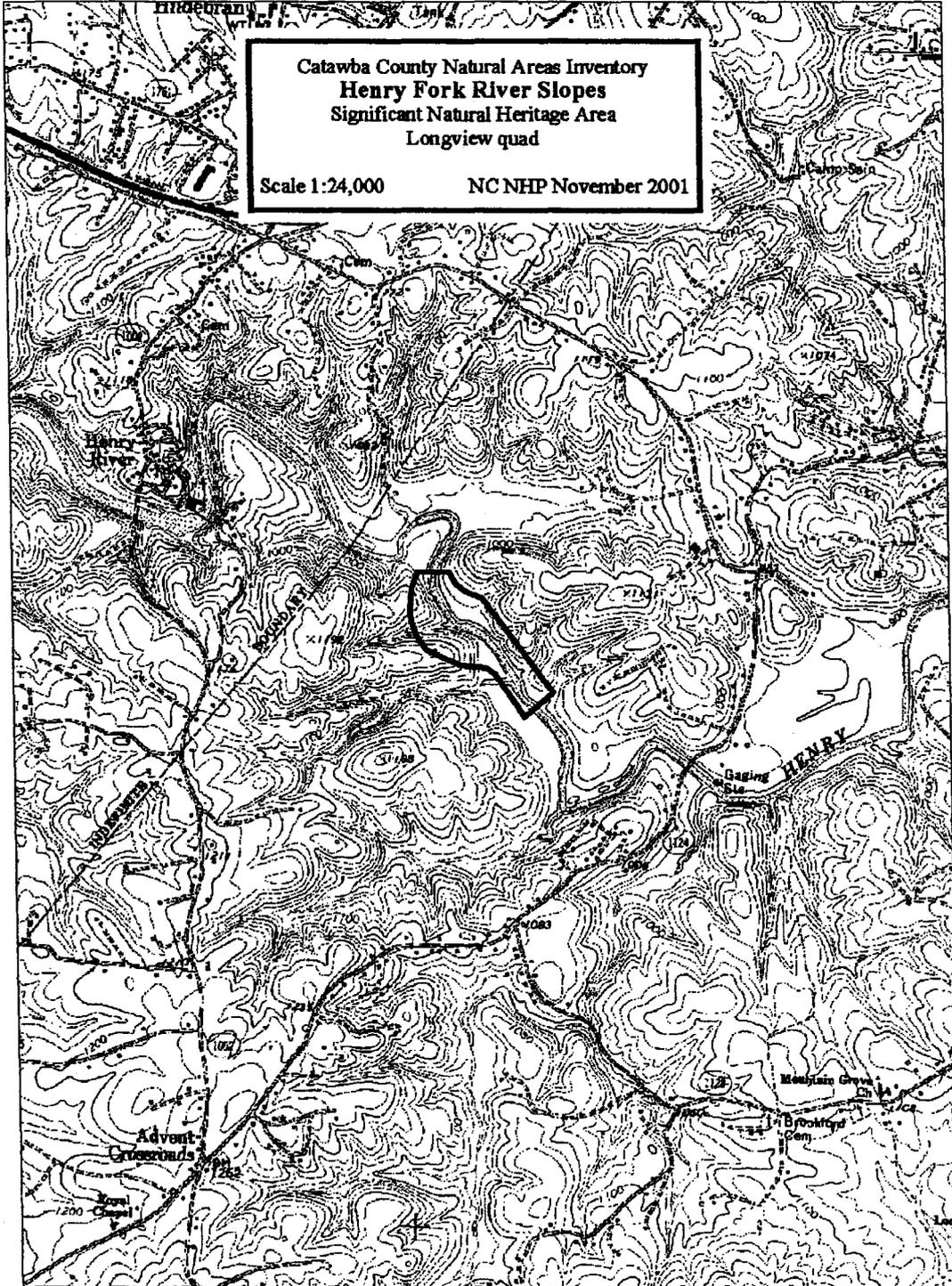
Hamel, P. B. 1992. The Land Manager's Guide to the Birds of the South. The Nature Conservancy, Southeastern Region, Chapel Hill, NC.

Rossell, C. R., Jr. 2002. Site Survey Report: Henry Fork River Slopes. N.C. Natural Heritage Program, DPR, DENR, Raleigh, NC.

Catawba County Natural Areas Inventory  
Henry Fork River Slopes  
Significant Natural Heritage Area  
Longview quad

Scale 1:24,000

NC NHP November 2001



## Catawba County Natural Area Inventory

### BAKER MOUNTAIN Significant Natural Heritage Area

**Site Significance:** State  
**Quadrangles:** Longview

**Size:** 1,176 acres  
**Ownership:** Public & Private

**SIGNIFICANT FEATURES:** This is the largest and most prominent contiguous tract of mature forest in Catawba County. The site contains Baker Mountain, an isolated monadnock, which is the highest point in Catawba County. There is a diversity of intact forest communities, including a Chestnut Oak Forest, White Pine Forest, Pine-Oak-Heath and Dry Oak-Hickory Forests, Dry-Mesic Oak-Hickory and Mesic Mixed Hardwood Forests (Piedmont Subtype), and Low Elevation Seeps. Several of these communities are NC NHP Element Occurrence Records. At least 12 rare or uncommon flowering plants occur at the site (Moye 1993). The extensive and diverse forest types provide excellent wildlife habitat, particularly for those species associated with forest-interior conditions. Many notable bird species breed at this site or use it as a stop-over area during migration.

**GENERAL DESCRIPTION:** The site is a large, contiguous tract of mature forests, surrounding Baker Mountain, an isolated monadnock, and the highest point in Catawba County. The forests are intact and fragmented by a few roads. There is a 198-acre undeveloped county park located near the top of Baker Mountain. There is a powerline right-of-way on the north side of the mountain that leads to several communication towers at the top. Elevations range from 1000-1200 feet in stream valleys to 1700-1780 feet on ridgetops. Four headwater streams originate on the south side of Baker Mountain and at least two headwater streams originate on the north side. Streams on the south side flow into the Jacob Fork River, and those on the north side flow into the Henry Fork River. Streams are generally small, have sand to coarse gravel bottoms, and are interspersed with occasional large rocks. Water quality of the streams is good; waters are generally cold and clear, with relatively low silt levels.

The site contains a high diversity of plant communities, including a large mature Chestnut Oak Forest at the higher elevations; White Pine, Pine-Oak-Heath, and Dry Oak-Hickory Forests on xeric slopes and ridges; Dry-Mesic Oak-Hickory and Mesic Mixed Hardwood Forests (Piedmont Subtype) on mid- and lower-slopes; and Low Elevation Seeps along streams. Community descriptions can be found in Moye (1993). Moye (1993) identified 12 flowering plants at the site that are rare or uncommon in the state, including the dwarf-flowered heartleaf (*Hexastylis naniflora*), sweet pine sap (*Monotropsis odorata*), shinyleaf meadowsweet (*Spirea betulifolia* var. *corymbosa*), Appalachian golden-banner (*Thermopsis mollis*), piedmont indigo bush (*Amorpha schwerini*), Biltmore carrion-flower (*Smilax biltmoreana*), Boynton's locust (*Robinia boyntonii*), smooth peavine (*Lathyrus venosus*), kidneyleaf rosinweed (*Silphium compositum* var. *reniforme*), beargrass (*Xerophyllum asphodeloides*), weakleaf yucca (*Yucca flaccida*), and small spreading pogonia (*Cleistes bifaria*).

A rich avian fauna occurs at the site as a result of the wide range of elevations and diverse plant communities. Many of the bird species that use Baker Mountain are forest-interior species commonly associated with the mountains. The site provides important stop-over and breeding habitats for a number of uncommon birds in Catawba County and the Piedmont. Uncommon species that probably breed at the site include Ruffed Grouse (*Bonasa umbellus*), Sharp-shinned Hawk (*Accipiter striatus*; State Rare), Wood Thrush (*Hylocichla mustelina*), Blue-headed Vireo (*Vireo solitarius*), Black-throated Green Warbler (*Dendroica virens*), Black-and-white Warbler (*Mniotilta varia*), Black-throated Blue Warbler (*Dendroica caerulescens*), American Redstart (*Setophaga ruticilla*), Hooded Warbler (*Wilsonia citrina*), Ovenbird (*Seiurus aurocapillus*), Summer Tanager (*Piranga rubra*), and Rose-breasted Grosbeak (*Pheucticus ludovicianus*).

**MANAGEMENT AND PROTECTION:** Management of the site should include repairing the trail heading east off of the north side of Baker Mountain, and maintaining a series of trails for hiking. All motorized vehicles should be prohibited in the forests because of erosion to the trails. A hands-off forest management policy should be implemented to minimize management costs and to allow the forest to mature. Development within the site (including the county park) should be kept to a minimum. If development within the park is decided upon, careful planning and siting of recreation facilities and trails needs to be done to minimize and prevent impacts to natural features and habitats of the site. The entire site needs to be protected either by conservation easements or by purchase by the state or county. This site would make an excellent state park, expanded county park, or wildlife preserve. Efforts should be made to obtain easements to connect this site to the Jacob Fork River.

**RARE AND NOTEWORTHY PLANTS:**

Dwarf-flowered heartleaf (*Hexastylis naniflora*), E  
Sweet pine sap (*Monotropsis odorata*), C  
Piedmont indigo bush (*Amorpha schwerini*), C  
Biltmore carrion-flower (*Smilax biltmoreana*), C  
Shinyleaf meadowsweet (*Spirea betulifolia* var. *corymbosa*), SR  
Appalachian golden-banner (*Thermopsis mollis*), SR  
Boynton's locust (*Robina boyntonii*), W7  
Smooth peavine (*Lathyrus venosus*), W7  
Kidneyleaf rosinweed (*Silphium compositum* var. *reniforme*), W7  
Beargrass (*Xerophyllum asphodeloides*), W1  
Weakleaf yucca (*Yucca flaccida*), W7  
Small spreading pogonia (*Cleistes bifaria*), W7  
Wax myrtle (*Myrica heterophylla*), W6  
Laurel-leaved catbrier (*Smilax laurifolia*), W6

**RARE AND NOTEWORTHY ANIMALS:**

Gray Treefrog (probably *Hyla chrysoscelis*; but possibly *H. versicolor*, W3, W4). One individual calling along the ridge of Baker Mountain just east of radio tower.  
Ruffed Grouse (*Bonasa umbellus*). Forest-interior species. Commonly found in the mountains. Uncommon in the Piedmont and Catawba County. A population seems to be thriving at this site.

Sharp-shinned Hawk (*Accipiter striatus*), SR. Forest-interior species. One individual calling loudly on mesic hardwood slope on south side of Baker Mountain. Probably nesting in the area, but nest not found.

Hermit Thrush (*Catharus guttatus*), SR. Forest-interior species. Several (4-5) individuals heard singing on the south side of the Mountain. Likely late migrants using the site as a stop-over area during migration.

Wood Thrush (*Hylocichla mustelina*). Forest-interior species. Relatively uncommon in Catawba County. Probably breeding. Associated with rich deciduous or mixed forests, with well-developed understories.

Blue-headed Vireo (*Vireo solitarius*). Forest-interior species. Relatively uncommon in the Piedmont and occurs mainly in the mountains. Probably breeding. Associated with middle-aged to mature forests.

Black-throated Green Warbler (*Dendroica virens*). Forest-interior species. Relatively uncommon in the Piedmont and occurs mainly in the mountains. Probably breeding. Associated with moist forests that contain conifers.

Black-throated Blue Warbler (*Dendroica caerulescens*). Forest-interior species. Relatively uncommon in the Piedmont and occurs mainly in the mountains. Possibly breeding or late migrant. Associated with medium-growth forests, with dense understories of rhododendron or mountain laurel.

American Redstart (*Setophaga ruticilla*), Forest-interior species. Relatively uncommon in Catawba County. Probably breeding. Generally associated with open woodlands and water.

Hooded Warbler (*Wilsonia citrina*). Forest-interior species. Relatively uncommon in Catawba County. Probably breeding. Associated with deciduous forests, with rich understories.

Ovenbird (*Seiurus aurocapillus*). Forest-interior species. Relatively uncommon in Catawba County. Probably breeding. Associated with upland forests, with moderate understories.

Summer Tanager (*Piranga rubra*). Forest-interior species. Relatively uncommon in Catawba County. Probably breeding. Associated with open to medium-growth forests on dry sites.

Rose-breasted Grosbeak (*Pheucticus ludovicianus*). Forest-interior species. Relatively uncommon in the Piedmont and occurs mainly in the mountains. Possibly breeding or late migrant. Associated with mature hardwood forests.

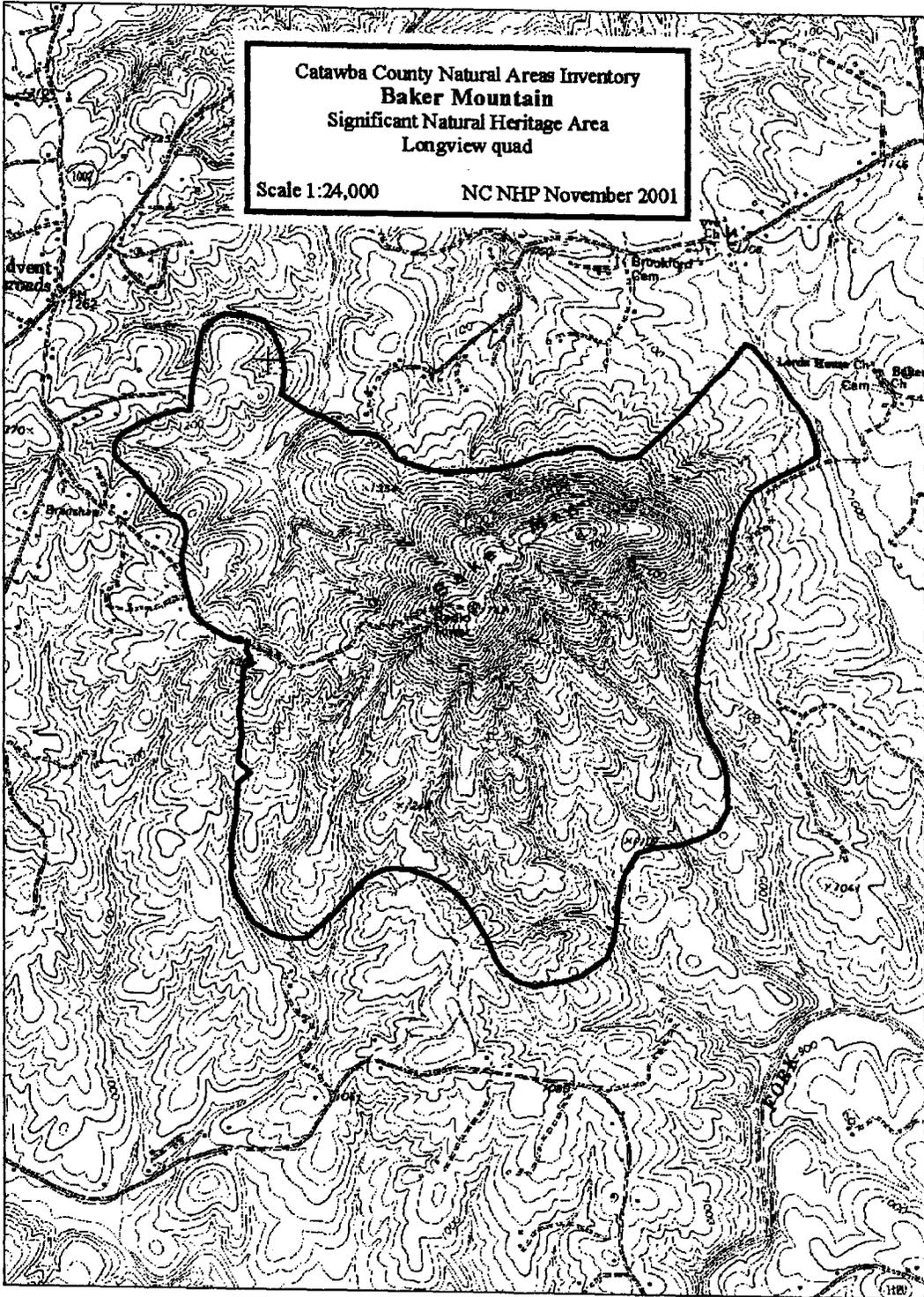
#### **REFERENCES:**

- Hamel, P. B. 1992. The Land Manager's Guide to the Birds of the South. The Nature Conservancy, Southeastern Region, Chapel Hill, NC.
- Moye, W. S. 1993. Site Survey Report: Baker Mountain. N.C. Natural Heritage Program, DPR, DENR, Raleigh, NC.
- Rossell, C. R., Jr. 2002. Site Survey Report: Baker Mountain. N.C. Natural Heritage Program, DPR, DENR, Raleigh, NC.

Catawba County Natural Areas Inventory  
Baker Mountain  
Significant Natural Heritage Area  
Longview quad

Scale 1:24,000

NC NHP November 2001



## Catawba County Natural Area Inventory

### JACOB FORK AQUATIC HABITAT Significant Natural Area

**Site Significance:** Regional

**Size:** 27 river miles

**Quadrangles:** Banoak, Longview, and Hickory

**Ownership:** North Carolina

**SIGNIFICANT FEATURES:** This stretch of the Jacob Fork River contains high quality waters and a diversity of aquatic habitats, including many with montane features uncommon in the Piedmont. This site has been previously identified as a significant aquatic habitat by the NC NHP. The site provides habitat for at least three species of conservation concern: the significantly rare mayfly *Baetisca laurentina*, the significantly rare Santee Chub (*Cyprinella zanema* pop. 1), and the uncommon Gulf Coast spiny softshell (*Apalone spinifera aspera*; NC NHP Watchlist). Aquatic habitats also provide important foraging areas for many bird species uncommon in Catawba County. Much of the site flows through the Jacob Fork West and Jacob Fork East Corridors.

**GENERAL DESCRIPTION:** This site begins at the confluence of the Jacob Fork River and the Little River in Burke County and ends just beyond the confluence with the Henry Fork River near NC 10. The aquatic habitats include the upper and middle sections of the Jacob Fork. The headwaters of the river are protected in South Mountains State Park (Burke County). The site also is afforded some protection by the wooded riparian zones along the Jacob Fork West and Jacob Fork East Corridors in Catawba County.

The waters of the Jacob Fork River in Catawba County are rated WS-III (waters used as potable in low to moderately developed watersheds; waters were classified by NC Division of Water Quality 1992). The aquatic habitats of the river are diverse. The river meanders extensively and has both slow and fast flowing stretches. The substrate of the river ranges from silt and sand to large, rock shoals. Aquatic habitats include deep pools, sandbars, small riffles, and medium-sized rapids. Silt and agricultural runoff are a problem for many stretches of the river. Vegetation buffers along agricultural fields are often inadequate to prevent silt from entering the river. Some banks are completely denuded of vegetation and eroding as a result of cows accessing the river. Residential development is also increasing along the river, adding further to the siltation problem of the river (see Site Descriptions for Jacob Fork West and East Corridors for additional information).

The diverse aquatic habitats of the Jacob Fork provide important breeding and foraging areas for many species of wildlife. At least three species of conservation concern use the aquatic habitats for breeding. These include the significantly rare mayfly *Baetisca laurentina*, the significantly rare Santee Chub, and the uncommon Gulf Coast spiny softshell. Several Santee Chub were captured in 1972 and 1974 in the middle section of the Jacob Fork River (west end of the Jacob Fork East Corridor). The stretch of river where these fish were captured was a slow, deep section, with a sand/silt bottom. The Gulf Coast spiny softshell (Watchlist) also uses the river

for breeding. A juvenile was captured during this inventory in the upper section of the Jacob Fork (in the Jacob Fork West Corridor) in a slow moving stretch of water adjacent to a sandbar. Many species of birds also use the river for foraging, including the Great Blue Heron (*Ardea herodias*), Belted Kingfisher (*Megaceryle alcyon*), and Louisiana Waterthrush (*Seiurus motacilla*).

**MANAGEMENT AND PROTECTION:** Measures should be taken to reduce and prevent siltation of the river. Cows should be excluded from the river, and disturbed banks should be renaturalized and planted with native vegetation. Vegetation buffers should be established along the entire length of the river to reduce the potential of silt entering the river. Protection of the riparian zone along the river could be in the form of conservation easements.

**RARE AND NOTEWORTHY PLANTS:** None.

**RARE AND NOTEWORTHY ANIMALS:**

a Mayfly *Baetisca laurentina*, SR.

Santee Chub (*Cyprinella zanema* pop 1), SR. Associated with pools over sandy substrates.

Gulf Coast Spiny Softshell (*Apalone spinifera aspera*), W2. Associated with streams with sandy substrates and sandbars.

Louisiana Waterthrush (*Seiurus motacilla*). Forest-interior species. Relatively uncommon in Catawba County. Probably breeding. Associated with deciduous forests, with rocky streams.

**REFERENCES:**

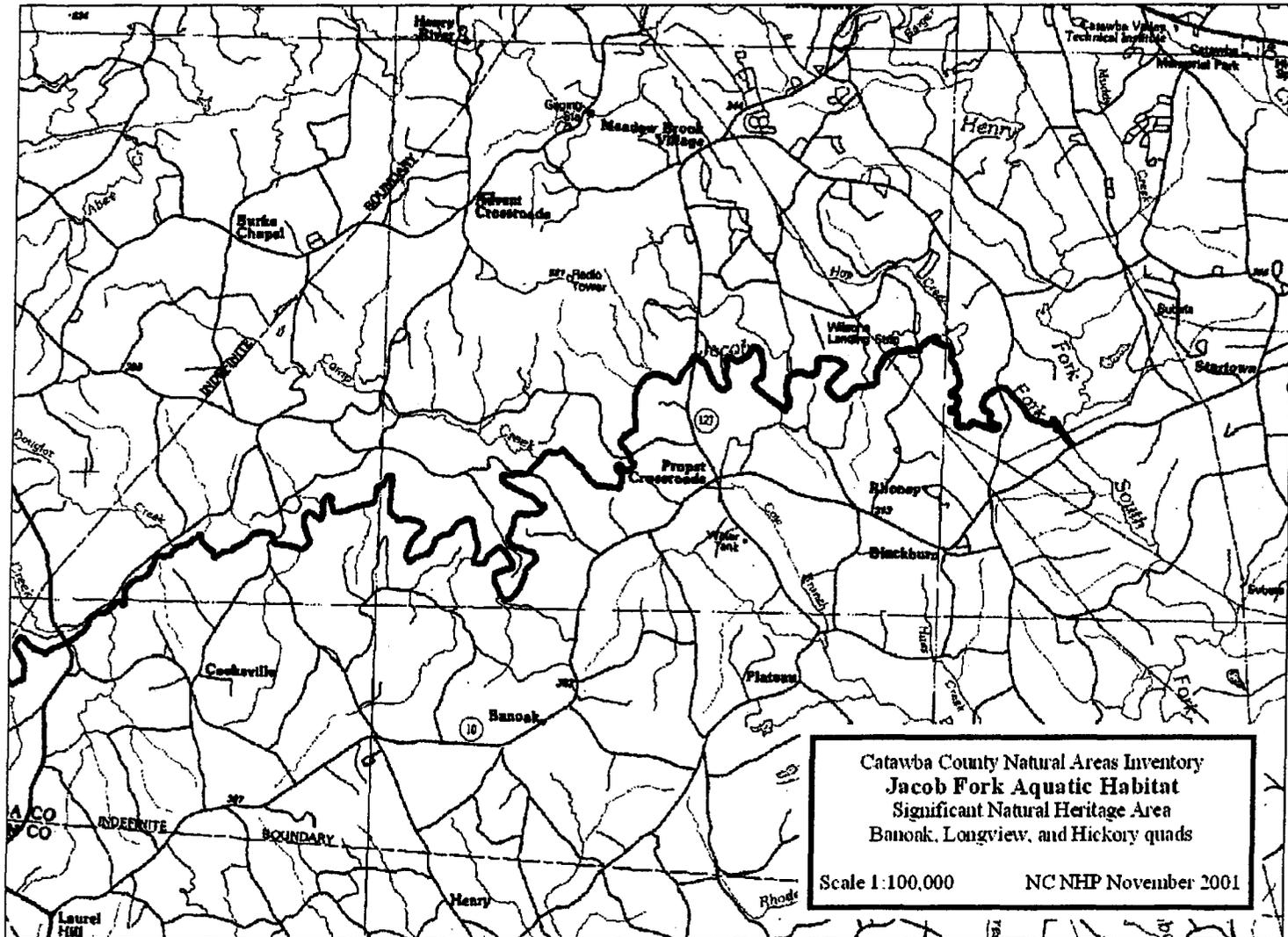
Hamel, P. B. 1992. The Land Manager's Guide to the Birds of the South. The Nature Conservancy, Southeastern Region, Chapel Hill, NC

LeGrand, H. E., Jr., and S. P. Hall. 1999. Natural Heritage Program List of the Rare Animal Species of North Carolina. N.C. Natural Heritage Program, DPR, DENR, Raleigh, NC.

Menhinick, E. F. 1997. *Cyprinella* (= *Hybopsis*) *zanema* form, Thinlip Chub. Pp. 50 In Endangered, Threatened, and Rare Fauna of North Carolina. Part IV. A Reevaluation of the Freshwater Fishes. Occasional Papers of the NC Museum of Natural Sciences and the NC Biological Survey. No. 11.

Rossell, C. R., Jr 2002. Site Survey Report: Jacob Fork West Corridor. N.C. Natural Heritage Program, DPR, DENR, Raleigh, NC.

Rossell, C. R., Jr 2002. Site Survey Report: Jacob Fork East Corridor. N.C. Natural Heritage Program, DPR, DENR, Raleigh, NC.



## Catawba County Natural Area Inventory

### JACOB FORK WEST CORRIDOR Significant Natural Heritage Area

**Site Significance:** National  
**Quadrangles:** Banoak and Longview

**Size:** 665 acres  
**Ownership:** Private

**SIGNIFICANT FEATURES:** This site incorporates the previously known, nationally significant Catawba County Wildlife Club Heartleaf Site. The riparian corridor is probably the least disturbed corridor in Catawba County. This section of the Jacob Fork has relatively high water quality and contains a diversity of aquatic and terrestrial habitats. One Gulf Coast spiny softshell (*Apalone spinifera aspera*; Watchlist) was collected in a slow-moving stretch of the river. Terrestrial habitats include some large, intact tracts of forest that provide forest-interior conditions. The site provides breeding habitat for a variety of bird species, many of which are uncommon in Catawba County, including the Baltimore Oriole (*Icterus galbula*; Watchlist). The site also provides protection for the Jacob Fork Aquatic Habitat, with its rare animals.

**GENERAL DESCRIPTION:** The site is basically a narrow wooded riparian corridor along the Jacob Fork River. It includes some intact forests on the slopes and uplands, as well some edges of agricultural fields and an abandoned apple orchard. Some stretches of the corridor contain steep, rocky slopes on one or both sides of the river and swift flowing water over rocky shoals.

The waters of this section of the Jacob Fork are significant aquatic habitat and classified WS-III (waters used as potable in low to moderately developed watersheds; waters were classified by NC Division of Water Quality in 1992). Several headwater streams and one larger stream also occur within the site. Disturbance of the riparian zone along the river is low to moderate, with cows having access to the river at several points and residential development increasing.

Fair to good examples of Piedmont/Mountain Levee Forests are represented along most of the wooded banks of the corridor. The canopy consists of sycamore (*Platanus occidentalis*), yellow poplar (*Liriodendron tulipifera*), river birch (*Betula nigra*), and green ash (*Fraxinus pennsylvanica*), with cottonwood (*Populus deltoides*), loblolly pine (*Pinus taeda*), short leaf pine (*Pinus echinata*), scrub pine (*Pinus virginiana*), southern red oak (*Quercus falcata*), and mockernut hickory (*Carya tomentosa*) scattered throughout. The density of the understory ranges from sparse to dense, with a mixed composition. Species in the understory include ironwood (*Carpinus caroliniana*), flowering dogwood (*Cornus florida*), silverbell (*Halesia carolina*), red maple (*Acer rubrum*), box elder (*Acer negundo*), black walnut (*Juglans nigra*), tag alder (*Alnus serrulata*), sweet gum (*Liquidambar styraciflua*), umbrella magnolia (*Magnolia tripetala*), sourwood (*Oxydendrum arboreum*), persimmon (*Diospyros virginiana*), American holly (*Ilex opaca*), and American beech (*Fagus grandifolia*). The density of the shrub layer also varies throughout the corridor and includes yellowroot (*Xanthorrhiza simplicissima*), fetterbush (*Leucothoe axillaris* var. *editorum*), elderberry (*Sambucus canadensis*), silky dogwood (*Cornus amomum*), spicebush (*Lindera benzoin*), mapleleaf viburnum (*Viburnum acerifolium*), cane

(*Arundanaria gigantea*), sand myrtle (*Leiophyllum buxifolium*), mountain laurel (*Kalmia latifolia*), rosebay (*Rhododendron maximum*), and wild azalea (*Rhododendron nudiflorum*). The herb layer is relatively sparse except in areas with open canopies. Herbs include false nettle (*Boehmeria cylindrica*), Virginia creeper (*Parthenocissus quinquefolia*), trumpetvine (*Campsis radicans*), poison ivy (*Toxicodendron radicans*), jewelweed (*Impatiens* sp.), netted chain fern (*Woodwardia areolata*), ebony spleenwort (*Asplenium platyneuron*), pokeweed (*Phytolacca americana*), and ironweed (*Vernonia noveboracensis*).

Other forest types also occur throughout the site. Fair to good examples of Piedmont/Mountain Bottomland Forests are represented on the wider floodplains. Upland slopes consist of fair to good examples of Dry-Mesic Oak-Hickory Forests, and ridgetops consist of fair to good examples of Dry Oak-Hickory Forests. Two significant Natural Heritage records also have been documented within this site: a large population (> 1000 individuals) of the federally threatened dwarf-flowered heartleaf (*Hexastylis naniflora*), and a community occurrence of a Dry-Mesic Oak-Hickory Forest. Both records are located on the south side of the river on the Catawba County Wildlife Club lands.

The site contains diverse aquatic and terrestrial habitats for wildlife. Aquatic habitats vary from fast flowing stretches of river, with rocky substrates to slow flowing stretches of river, with sandy substrates. An uncommon turtle, the Gulf Coast spiny softshell (Watchlist), was collected in a slow-moving stretch, adjacent to a sandbar. The river is abundant with fish, and provides food for a variety of bird species, including the Wood Duck (*Aix sponsa*), Great Blue Heron (*Ardea herodias*), Solitary Sandpiper (*Tringa solitaria*), and Belted Kingfisher (*Megaceryle alcyon*). Terrestrial habitats include large tracts of forests that provide forest-interior conditions. The site provides breeding habitat for a variety of bird species, including many neotropical migrants that are uncommon in Catawba County. Neotropical migrants that are probable breeders at the site include the Baltimore Oriole (Watchlist), Wood Thrush (*Hylocichla mustelina*), Yellow-throated Vireo (*Vireo flavifrons*), Black-and-white Warbler (*Mniotilta varia*), Prairie Warbler (*Dendroica discolor*), Hooded Warbler (*Wilsonia citrina*), Kentucky Warbler (*Oporornis formosus*), Louisiana Waterthrush (*Seiurus motacilla*), and Ovenbird (*Seiurus aurocapillus*).

**MANAGEMENT AND PROTECTION:** Cows should be excluded from the river, and disturbed banks should be renaturalized and planted with native vegetation. Vegetation buffers around agricultural fields should be established and their widths maximized to reduce siltation of the river. All forests should be allowed to mature. The riparian zone along the river should be the first priority for protection. Second priority for protection should be the slopes and upland forests. Protection could be in the form of conservation easements. The Catawba County Wildlife Club Heartleaf Site is protected as a Registered Natural Heritage Area. In the future, a conservation easement protecting the Heartleaf Site would provide more permanent protection.

**RARE AND NOTEWORTHY PLANTS:**

Dwarf-flowered Heartleaf (*Hexastylis naniflora*), T. Population of over 1000 individuals recorded in 1985 in a clearcut and mature mesic hardwood slope on the Catawba County

Wildlife Club lands.

**RARE AND NOTEWORTHY ANIMALS:**

Gulf Coast Spiny Softshell (*Apalone spinifera aspera*), W2. One juvenile was captured in the Jacob Fork near a sandbar, in an area containing a sandy substrate.

Baltimore Oriole (*Icterus galbula*), W2. One individual male observed singing in a wooded grove along the river at the east end of the corridor. Possibly breeding. Associated with scattered woods in open country, often near water.

Wood Thrush (*Hylocichla mustelina*). Forest-interior species. Relatively uncommon in Catawba County. Probably breeding. Associated with rich deciduous or mixed forests, with well-developed understories.

Yellow-throated Vireo (*Vireo flavifrons*). Forest-interior species. Relatively uncommon in Catawba County. Possibly breeding or late migrant. Associated with tall deciduous trees in open woods near water.

Black-and-white Warbler (*Mniotilta varia*). Forest-interior species. Relatively uncommon in Catawba County. Probably breeding. Associated with mature hardwood forests.

Prairie Warbler (*Dendroica discolor*). Old field species. Relatively uncommon in Catawba County and the Piedmont. Probably breeding. Associated with abandoned fields with scattered saplings.

Hooded Warbler (*Wilsonia citrina*). Forest-interior species. Relatively uncommon in Catawba County. Probably breeding. Associated with deciduous forests, with rich understories.

Kentucky Warbler (*Oporornis formosus*). Forest-interior species. Relatively uncommon in Catawba County. Probably breeding. Associated with moist deciduous forests, with thick understories.

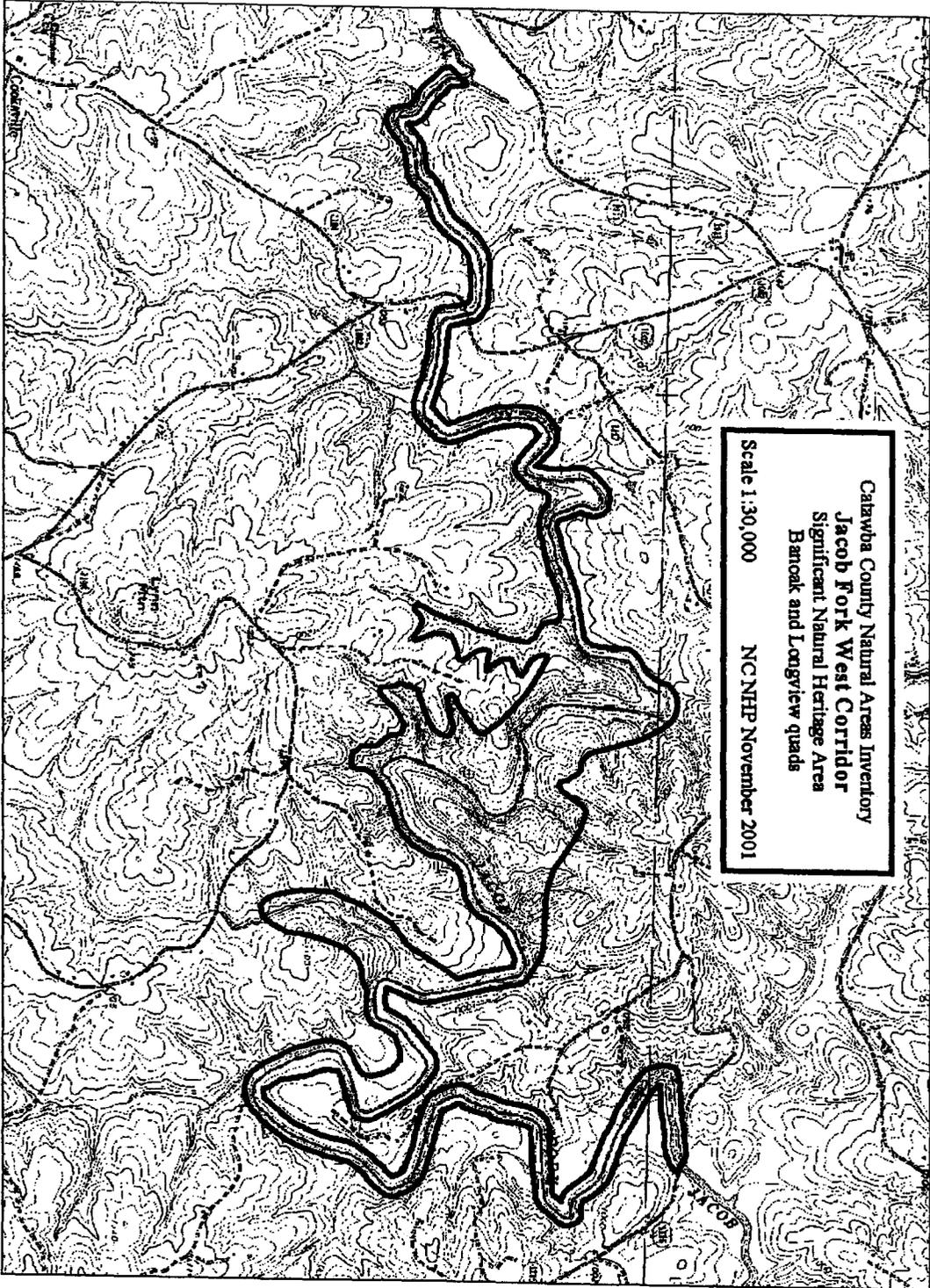
Louisiana Waterthrush (*Seiurus motacilla*). Forest-interior species. Relatively uncommon in Catawba County. Probably breeding. Associated with deciduous forests, with rocky streams.

Ovenbird (*Seiurus aurocapillus*). Forest-interior species. Relatively uncommon in Catawba County. Probably breeding. Associated with upland forests, with moderate understories.

**REFERENCES:**

Hamel, P. B. 1992. The Land Manager's Guide to the Birds of the South. The Nature Conservancy, Southeastern Region, Chapel Hill, NC

Rossell, C. R., Jr 2002. Site Survey Report: Jacob Fork West Corridor. N.C. Natural Heritage Program, DPR, DENR, Raleigh, NC.



## Catawba County Natural Area Inventory

### JACOB FORK EAST CORRIDOR Significant Natural Heritage Area

**Site Significance:** County

**Size:** 236 acres

**Quadrangles:** Hickory and Longview

**Ownership:** Private

**SIGNIFICANT FEATURES:** This is one of the few relatively intact riparian corridors in Catawba County. It contains fair examples of Piedmont/Mountain Levee Forests and Mesic Mixed Hardwood Forests (Piedmont Subtype). The riparian corridor protects the water quality of the Jacob Fork River and provides good wildlife habitat. This site is relatively close (ca. < 2 miles downstream) to the nationally significant Jacob Fork West Corridor. The significantly rare Santee chub (*Cyprinella zanema* pop. 1) was documented to occur within the site in 1972 and 1974. The site also provides protection for the Jacob Fork Aquatic Habitat, with its rare animals.

**GENERAL DESCRIPTION:** The site consists of a relatively narrow wooded riparian corridor along the Jacob Fork River. At the west end of the corridor is a small gorge, with steep rocky bluffs on both sides of the river, adding montane features. The site also includes a fairly large tract of second-growth, mixed hardwood forest on the north side of the river at the east end of the corridor. Fair examples of Piedmont/Low Mountain Alluvial Forests and Mesic Mixed Hardwood Forests (Piedmont Subtype) occur along the river and along the lower slopes in the mixed hardwood forest, respectively. Other upland communities are present, however, many are disturbed from logging, agriculture, or residential development. Several small areas of Bottomland forests and oak-hickory forests also occur throughout the site.

Waters of this section of the Jacob Fork are significant aquatic habitat and rated WS-III (waters used as potable in low to moderately developed watersheds; waters were classified by NC Division of Water Quality in 1992). The corridor contains at least two headwater streams. There is also a larger stream in the mixed hardwood forest that has a fairly steep gradient and rocky substrate. The riparian zone along the river is generally narrow, with varied amounts of disturbance. Some of the vegetation along the river banks is intact. However, a fair amount is disturbed. Some banks, for example, contain a thick shrub layer, with no canopy trees. In one small area, banks are highly disturbed as a result of cows accessing the river. The river is generally slow flowing, and is relatively wide and shallow through most of the corridor. The bottom consists mostly of silt and sand. There are stretches of exposed bedrock through the gorge that produce riffles and small rapids. The water quality of the river is fair, but declining as runoff and sedimentation loads increase from agriculture and residential development. The larger stream contains a series of very nice rock falls and deep pools, and the adjacent slopes are in good condition, with many montane features. The stream has a fairly high silt content, likely as a result of residential construction above the forest.

The Piedmont/Mountain Levee Forests support a canopy of river birch (*Betula nigra*), sycamore (*Platanus occidentalis*), yellow poplar (*Liriodendron tulipifera*), sweetgum (*Liquidambar*

*styraciflua*), sourwood (*Oxydendrum arboreum*), and green ash (*Fraxinus pennsylvanica*). White oak (*Quercus alba*), post oak (*Quercus stellata*), and hickory (*Carya* spp.) are found on ridges and high berms. Box elder (*Acer negundo*) dominates in areas that are more recently disturbed. Development of the understory varies, with a mixed composition. Species include flowering dogwood (*Cornus florida*), silverbell (*Halesia carolina*), black gum (*Nyssa sylvatica*), mockernut hickory (*Carya tomentosa*), black cherry (*Prunus serotina*), and black willow (*Salix nigra*). Shrub density also varies and includes yellowroot (*Xanthorhiza simplicissima*), fetterbush (*Leucothoe axillaris* var. *editorum*), tag alder (*Alnus serrulata*), Virginia willow (*Itea virginica*), strawberry bush (*Euonymus americanus*), sweet-shrub (*Calycanthus floridus* var. *laevigatus*), elderberry (*Sambucus canadensis*), and silky dogwood (*Cornus amomum*). Several disturbed areas are dominated by the non-native, privet (*Ligustrum sinense*). The herb layer is relatively sparse, except in areas with open canopies. Herbs include false nettle (*Boehmeria cylindrica*), Virginia creeper (*Parthenocissus quinquefolia*), greenbrier (*Smilax* sp.), Japanese honeysuckle (*Lonicera japonica*), wild grape (*Vitis rotundifolia*), poison ivy (*Toxicodendron radicans*), wild yam (*Dioscorea villosa*), jewelweed (*Impatiens* sp.), netted chain fern (*Woodwardia areolata*), Christmas fern (*Polystichum acrostichoides*), and royal fern (*Osmunda regalis* var. *spectabilis*). Moderately disturbed areas are dominated by the non-native microstegium (*Microstegium vimineum*), and highly disturbed areas are dominated by the exotic kudzu (*Pueraria lobata*).

The Mesic Mixed Hardwood Forest (Piedmont Subtype) contains some montane characteristics as a result of the rockiness and steep gradient of the larger stream. This community has many physical similarities to an alluvial forest, but the species composition more resembles that of a mesic hardwood forest. The canopy is dominated by American beech (*Fagus grandifolia*), yellow poplar, green ash, sourwood, and white oak. The understory development varies and includes sweet gum, red maple (*Acer rubrum*), flowering dogwood, silverbell, black gum, and black cherry. The shrub layer supports yellowroot, mountain laurel (*Kalmia latifolia*), blueberry (*Vaccinium* sp.), hazel (*Corylus* sp.), rose (*Rosa* sp.), and strawberry bush. Along the stream, shrubs include tag alder and silky dogwood. Privet is scattered throughout. The herb layer is moderately developed and includes jewelweed, partridgeberry (*Mitchella repens*), Virginia creeper, wild grape, poison ivy, greenbrier, Christmas fern, golden rod (*Solidago* sp.), downy yellow foxglove (*Aureolaria virginica*), heal-all (*Prunella vulgaris*), and spotted wintergreen (*Chimaphila maculata*). The non-native Asiatic dayflower (*Commelina communis*) and smartweed (*Polygonum* spp.) are associated with microstegium along the stream. Several areas with heartleaf (*Hexastylis* sp.) are evident, and there is potential for the presence of the federally threatened dwarf-flowered heartleaf (*H. naniflora*).

A fairly rich avian fauna is associated with the riparian corridor and the large tract of mixed hardwood forest. Several notable neotropical migrants that are considered forest-interior species probably breed at the site, including the Ruby-throated Hummingbird (*Archilochus colubris*), Acadian Flycatcher (*Empidonax virescens*), Blue-gray Gnatcatcher (*Polioptila caerulea*), Red-eyed Vireo (*Vireo olivaceus*), Worm-eating Warbler (*Helmitheros vermivorus*), Ovenbird (*Seiurus aurocapillus*), and Scarlet Tanager (*Piranga olivacea*). The site also may provide habitat for two species of conservation concern: the significantly rare Santee chub (*Cyprinella*

*zanema* pop. 1), and the uncommon Gulf Coast spiny softshell (*Apalone spinifera aspera*). One *A. s. aspera* was captured in 2001, approximately 2 miles upstream of the site in the nationally significant Jacob Fork West Corridor. Several *C. zanema* were captured in 1972 and 1974 in the Jacob Fork River at the west end of the corridor.

**MANAGEMENT AND PROTECTION:** Cows should be excluded from the river, and disturbed banks should be renaturalized and planted with native vegetation. Kudzu and other aggressive exotics should be eradicated from the riparian zone. The width of the riparian corridor should be increased to protect water quality and to enhance the habitat for wildlife. All forested bottomlands, slopes, and uplands should be protected and allowed to mature. The riparian zone along the river should be the first priority for protection. Second priority for protection should be the slopes and upland forests. Protection could be in the form of conservation easements.

**RARE AND NOTEWORTHY PLANTS:** None.

**RARE AND NOTEWORTHY ANIMALS:**

Santee Chub (*Cyprinella zanema* pop 1), SR. Several individuals captured in 1972 and 1974 in the Jacob Fork at the bridge of NC 127 (west end of the corridor).

Ruby-throated Hummingbird (*Archilochus colubris*). Forest-interior species. Probably breeding. Moderately common in Catawba County. Associated with woods and thickets containing tubular flowers, usually in moist habitats.

Acadian Flycatcher (*Empidonax virescens*). Forest-interior species. Probably breeding. Moderately common in Catawba County. Associated with moist deciduous woods near water.

Blue-gray Gnatcatcher (*Polioptila caerulea*). Forest-interior species. Probably breeding. Associated with mature and moist hardwood forests.

Red-eyed Vireo (*Vireo olivaceus*). Forest-interior species. Probably breeding. Associated with deciduous forests.

Worm-eating Warbler (*Helmitheros vermivorus*). Forest-interior species. Probably breeding. Relatively uncommon in Catawba County. Associated with forests on steep slopes that have dense, broadleaf evergreen understories.

Ovenbird (*Seiurus aurocapillus*). Forest-interior species. Relatively uncommon in Catawba County. Probably breeding. Associated with upland forests, with moderate understories.

Scarlet Tanager (*Piranga olivacea*). Forest-interior species. Probably breeding. Associated with mature deciduous forests.

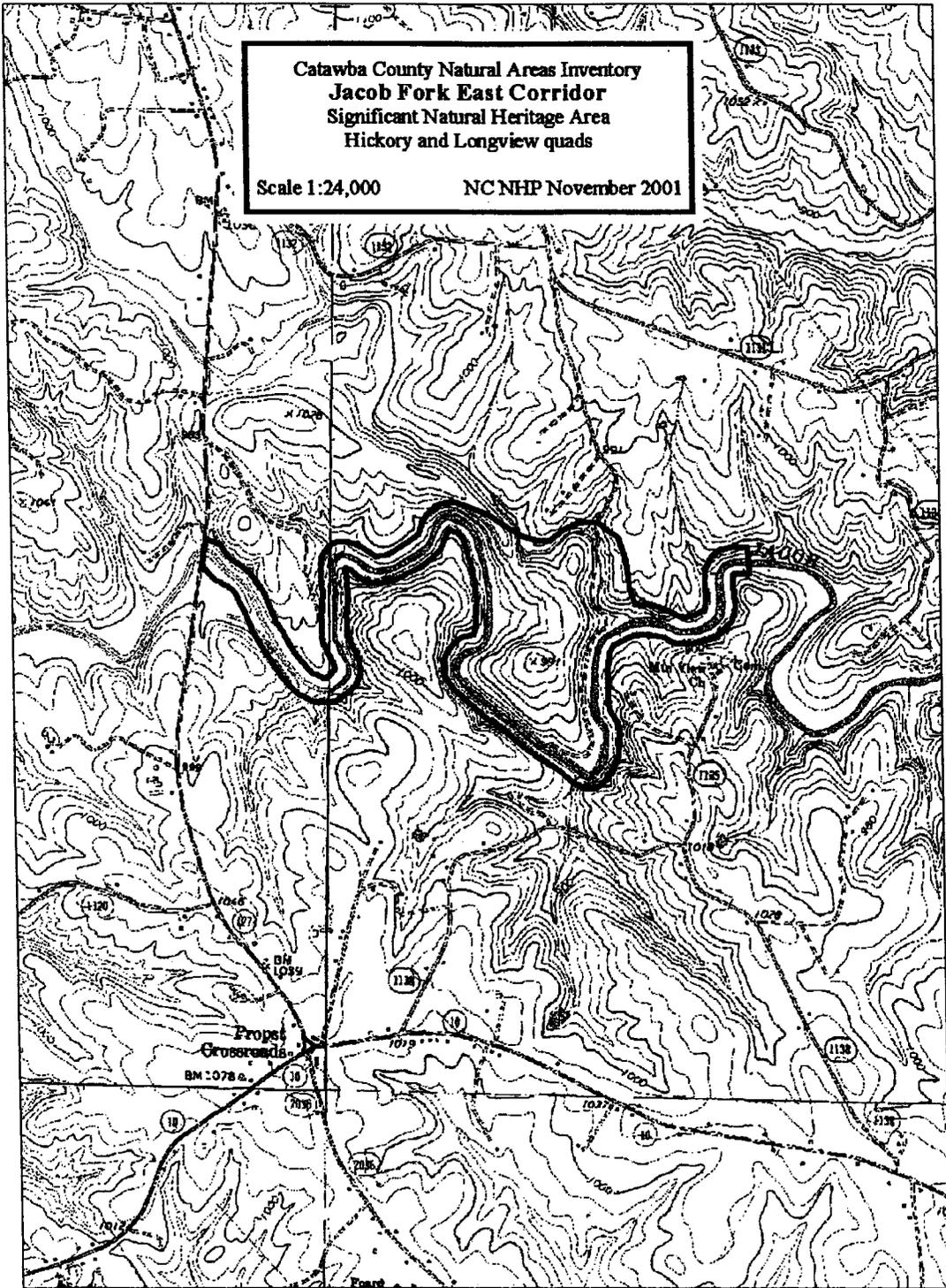
**REFERENCES:**

- Hamel, P. B. 1992. The Land Manager's Guide to the Birds of the South. The Nature Conservancy, Southeastern Region, Chapel Hill, NC
- Rossell, C. R., Jr 2002. Site Survey Report: Jacob Fork East Corridor. N.C. Natural Heritage Program, DPR, DENR, Raleigh, NC.

Catawba County Natural Areas Inventory  
Jacob Fork East Corridor  
Significant Natural Heritage Area  
Hickory and Longview quads

Scale 1:24,000

NC NHP November 2001



## Catawba County Natural Area Inventory

### CATAWBA RIVER CORRIDOR Significant Natural Heritage Area

**Site Significance:** Regional  
**Quadrangles:** Millersville

**Size:** 462 acres  
**Ownership:** Public & Private

**SIGNIFICANT FEATURES:** This is the most extensive riparian corridor along the Catawba River in Catawba County. It provides important habitat for many species of wildlife that are uncommon in the County and the Piedmont, including two federally listed species: the Bald Eagle (*Haliaeetus leucocephalus*; Endangered) and the eastern woodrat (*Neotoma floridana*; Special Concern). This site contains the richest avian fauna (63 species recorded) of all the Significant Natural Heritage Areas in Catawba County. Notable species that use the site include the Least Bittern (*Ixobrychus exilis*; Watchlist), Osprey (*Pandion haliaetus*), Cliff Swallow (*Petrochelidon pyrrhonota*), Baltimore Oriole (*Icterus galbula*; Watchlist), and Prothonotary Warbler (*Protonotaria citrea*). Fair examples of a Piedmont/Mountain Levee Forest, a Piedmont/Mountain Semipermanent Impoundment, and a Low Elevation Seep also occur within the site, adding diversity to the habitats along the river.

**GENERAL DESCRIPTION:** The site consists of forested bottomlands and lower slopes along the Catawba River. The site includes two islands in the river, a small pond, and a wetland in Riverbend Park (west end of the site). There is also a disjunct section, which is approximately 2 miles downstream of the primary site that contains a steep, rocky slope and a wooded island. The majority of the woodlands along the river are fair quality Piedmont/Mountain Levee Forests. Some areas along the river are disturbed from agriculture and residential development.

The waters of this section of the Catawba River are classified WS-IV (waters used as potable in highly developed watersheds; waters were rated by NC Division of Water Quality in 1999). The river is moderately flowing and has a sand and coarse-gravel bottom. Several long stretches flow over large, rocky shoals that produce riffle and pool habitats. Banks are generally in fair to moderate condition, with most having at least a narrow strip of trees along the edge of the river. One section of river borders a pasture, and the banks are highly disturbed and almost completely denuded of vegetation as a result of cows accessing the river. Another section contains 6-8 trailers/camps, with the floodplain planted in grass and a few canopy trees.

The Piedmont/Mountain Levee Forest along the river is diverse and supports a canopy of American sycamore (*Platanus occidentalis*), river birch (*Betula nigra*), yellow poplar (*Liriodendron tulipifera*), green ash (*Fraxinus pennsylvanica*), red oak (*Quercus rubra*), willow oak (*Q. phellos*), water oak (*Q. nigra*), southern red oak (*Q. falcata*), American elm (*Ulmus americana*), black walnut (*Juglans nigra*), scrub pine (*Pinus virginiana*), loblolly pine (*P. taeda*), and persimmon (*Diospyros virginiana*). The understory contains box elder (*Acer negundo*), ironwood (*Carpinus caroliniana*), flowering dogwood (*Cornus florida*), American beech (*Fagus grandifolia*), bitternut hickory (*Carya cordiformis*), and a few white pine (*Pinus*

*strobis*). Shrubs include redbud (*Cercis canadensis*), silky dogwood (*Cornus amomum*), cane (*Arundinaria gigantea*), spicebush (*Lindera benzoin*), and beaked hazelnut (*Corylus cornuta*). The herb layer consists of grape vine (*Vitis rotundifolia*), the non-native Japanese honeysuckle (*Lonicera japonica*), trumpet-vine (*Campsis radicans*), Christmas fern (*Polystichum acrostichoides*), ebony spleenwort (*Asplenium platyneuron*), false nettle (*Boehmeria cylindrica*), Virginia knotweed (*Tovara virginiana*), jack-in-the-pulpit (*Arisaema triphyllum*), mayapple (*Podophyllum peltatum*), indian pipe (*Monotropa uniflora*), bloodroot (*Sanguinaria canadensis*), wild geranium (*Geranium carolinianum*), agrimony (*Agrimonia parviflora*), bearsfoot (*Polymnia uvedalia*) and lopseed (*Phryma leptostachya*). Arrowhead (*Sagittaria* sp.), smartweed (*Polygonum* sp.), and pickerelweed (*Pontederia cordata*) occur along the shoreline.

The pond in Riverbend Park is a fair quality Piedmont/Mountain Semipermanent Impoundment. The canopy is limited to the edge of the pond, with some shrubs and herbs occurring in the littoral zone. The canopy consists of black willow (*Salix nigra*), river birch, sweetgum (*Liquidambar styraciflua*), American sycamore, and scrub pine. The understory is sparse and includes red maple (*Acer rubrum*), persimmon, and red cedar (*Juniperus virginiana*). The shrub layer is also sparse, except in the littoral zone, where silky dogwood, tag alder (*Alnus serrulata*), black haw (*Viburnum prunifolia*), and rose (*Rosa* sp., probably *palustris*) occur. Herbs are confined to the edge and littoral zone and include false nettle, heal-all (*Prunella vulgaris*), spike-rush (*Eleocharis quadrangulata*), ironweed (*Vernonia noveboracensis*), the non-native microstegium (*Microstegium vimenium*), vervain (*Verbena urticifolia*), soft rush (*Juncus* sp.), and smartweed.

The adjoining wetland occurs downstream of the pond and is a fair quality Low Elevation Seep. The canopy is generally sparse, except along the edge, where it is moderately thick. The canopy is composed primarily of black willow and red maple. River birch, persimmon, and scrub pine dominate the canopy along the edges. The understory is sparse and composed of transgressives. The shrub layer is also sparse and consists of silky willow (*Salix sericea*), tag alder, and silky dogwood. The herb layer is dense in open areas, but has a low diversity. Herbs include false nettle, jewelweed (*Impatiens capensis*), agrimony, ironweed, pokeweed (*Phytolacca americana*), microstegium, water hemlock (*Cicuta maculata*), soft rush, smartweed, and arrowleaf tearthumb (*P. sagittatum*).

This site contains a diversity of habitats and one of the richest faunal communities in Catawba County. It provides essential foraging and nesting grounds for many species that are uncommon, including two federally listed species: the Bald Eagle and eastern woodrat. Four species of amphibians, six species of reptiles (4 turtles, 1 lizard, and 1 snake), 63 species of birds, and 8 species of mammals were recorded during surveys (Appendix IV). This site had the highest number of bird species of any of the Significant Natural Heritage Areas in the county. See the Rare and Noteworthy Animals section below for a list of some of the more uncommon species that use the site.

**MANAGEMENT AND PROTECTION:** Cows should be excluded from the river and disturbed banks should be renaturalized and planted with native vegetation. Vegetation buffers

should be established around agricultural fields and their widths maximized to reduce siltation of the river. Forests should be managed for older growth and natural forest conditions. The riparian zone along both sides of the river needs to be protected to maintain a wooded corridor for wildlife and to protect the water quality of the Catawba River. Protection should include all slopes above the river, particularly those near the woodrat site, and could be in the form of conservation easements. The conservation value of this site would be enhanced if the adjacent upland forests also were protected. The portion of the corridor that includes Riverbend Park is protected.

**RARE AND NOTEWORTHY PLANTS:** None.

**RARE AND NOTEWORTHY ANIMALS:**

Bald Eagle (*Haliaeetus leucocephalus*), E. Two adults were observed on the edge of the river (Catawba County side) in the Riverbend area. No nest was found.

Eastern Woodrat (*Neotoma floridana*), SC. A food cache (storage) site was found in a large rock outcrop at the base of an upland slope on the floodplain. This is the only record in the County.

Least Bittern (*Ixobrychus exilis*), W3. Reportedly observed in the small wetland at Riverbend Park by David Campbell, Catawba County Bird Club, 15 May 2001.

Osprey (*Pandion haliaetus*). Several pairs were observed along the river. Uncommon in the Piedmont. Probably breeding. Associated with large bodies of water for foraging and nesting.

Cliff Swallow (*Petrochelidon pyrrhonota*); Colony located under the bridge of NC 16.

Uncommon in the Piedmont. Associated with bridges or dams at large lakes for nesting.

Wood Thrush (*Hylocichla mustelina*). Forest-interior species. Relatively uncommon in Catawba County. Probably breeding. Associated with rich forests, with well-developed understories.

Northern Parula (*Parula americana*). Forest-interior species. Relatively uncommon in Catawba County. Probably breeding. Associated with bottomland forests, swamps, and streams.

Yellow-throated Warbler (*Dendroica dominica*). Forest-interior species. Uncommon in the Piedmont. Possibly breeding or late migrant. Associated with tall deciduous trees near water.

Prothonotary Warbler (*Protonotaria citrea*). Forest-interior species. Several pairs observed along the river. Probably breeding. Only occurrence in Catawba County Inventory. Associated with water in bottomland forests, willow thickets, and swamps. Requires a cavity for nesting.

Prairie Warbler (*Dendroica discolor*). Old field species. Relatively uncommon in the Piedmont. Probably breeding. Associated with abandoned fields with scattered saplings.

Yellow Warbler (*Dendroica petechia*). Early-successional species. Relatively uncommon in the Piedmont. Probably breeding. Associated with shrubs along streams, ponds, and lakes.

Baltimore Oriole (*Icterus galbula*), W2. One male was observed singing in a wooded grove along the river. Possibly breeding. Associated with scattered woods, usually near water.

**REFERENCES:**

Hamel, P. B. 1992. The Land Manager's Guide to the Birds of the South. The Nature Conservancy, Southeastern Region, Chapel Hill, NC.

Rossell, C. R., Jr. 2002. Site Survey Report: Catawba River Corridor. N.C. Natural Heritage Program, DPR, DENR, Raleigh, NC.



## Catawba County Natural Area Inventory

### LYLE CREEK CORRIDOR Significant Natural Heritage Area

**Site Significance:** Regional

**Size:** 104 acres

**Quadrangles:** Newton and Catawba

**Ownership:** Public & Private

**SIGNIFICANT FEATURES:** This site contains a relatively intact riparian corridor along Lyle Creek, and fair examples of a Piedmont/Low Mountain Alluvial Forest and a Dry-Mesic Oak-Hickory Forest. A sizable population (500-750 plants) of the federally threatened dwarf-flowered heartleaf (*Hexastylis naniflora*) occurs at the south end of the corridor in Connor Park. This site also provides breeding grounds for a number of uncommon neotropical migrant bird species associated with forest-interior conditions, including the Wood Thrush (*Hylocichla mustelina*), Yellow-throated Vireo (*Vireo flavifrons*), Worm-eating Warbler (*Helmitheros vermivorus*), Northern Parula (*Parula americana*), and Louisiana Waterthrush (*Seiurus motacilla*).

**GENERAL DESCRIPTION:** The site consists of forested bottomlands and slopes, and some intact upland forests along Lyle Creek. It includes the historic Bunker Hill Covered Bridge and Connor Park. The corridor is bisected by I-40. The site contains fair examples of a Piedmont/Low Mountain Alluvial Forest and a Dry-Mesic Oak-Hickory Forest. The Piedmont/Low Mountain Alluvial Forest occurs primarily along Lyle Creek and its tributaries. The Dry-Mesic Oak-Hickory Forest occurs along the mid- and upper-slopes.

Waters of this section of Lyle Creek are classified WS-IV (waters used as potable in highly developed watersheds; waters were rated by NC Division of Water Quality in 1992). The corridor contains several headwater streams. Lyle Creek is generally slow flowing and moderately wide and shallow. It generally contains a sand/silt bottom, with some stretches extremely silted, particularly those south of I-40. There also are stretches at both ends of the corridor that have coarse gravel and rocky bottoms. These areas contain a diversity of aquatic habitats including deep pools, and varying size riffles and rapids. Some sandbar habitats also are present. Disturbance of the riparian zone along the creek varies from low to moderate upstream (north) of I-40 and moderate to high downstream (south) of I-40.

The Piedmont/Low Mountain Alluvial Forest contains a canopy dominated by river birch (*Betula nigra*), American sycamore (*Platanus occidentalis*), yellow poplar (*Liriodendron tulipifera*), sweet gum (*Liquidambar styraciflua*), black walnut (*Juglans nigra*), and green ash (*Fraxinus pennsylvanica*). Box elder (*Acer negundo*), short-leaf pine (*Pinus echinata*), and scrub pine (*P. virginiana*) dominate in recently disturbed areas. Understory development varies, with a mixed composition. Species include flowering dogwood (*Cornus florida*), black gum (*Nyssa sylvatica*), black cherry (*Prunus serotina*), ironwood (*Carpinus caroliniana*), sourwood (*Oxydendrum arborea*), and southern red oak (*Q. falcata*). The density of the shrub layer also varies and includes yellowroot (*Xanthorhiza simplicissima*), tag alder (*Alnus serrulata*), elderberry

(*Sambucus canadensis*), silky dogwood (*Cornus amomum*), silky willow (*Salix sericea*), and spicebush (*Lindera benzoin*). The herb layer is relatively sparse and includes trumpet-vine (*Campsis radicans*), Virginia creeper (*Parthenocissus quinquefolia*), Japanese honeysuckle (*Lonicera japonica*), foamflower (*Tiarella cordifolia*), galax (*Galax aphylla*), mayapple (*Podophyllum peltatum*), black cohosh (*Cimicifuga racemosa*), daffodil (*Narcissus pseudo-narcissus*), Asiatic dayflower (*Commelina communis*), soft rush (*Juncus* sp.), and jewelweed (*Impatiens* sp.).

The Dry-Mesic Oak-Hickory Forest is typical, but contains some montane species. The canopy is dominated by white oak (*Quercus alba*), red oak (*Q. rubra*), black oak (*Q. velutina*), mockernut hickory (*Carya tomentosa*), yellow poplar, scrub pine, and sourwood. The understory includes sweet gum, red maple (*Acer rubrum*), flowering dogwood, black cherry, ironwood, and a few white pine (*Pinus strobus*). The shrub layer supports mountain laurel (*Kalmia latifolia*), blueberry (*Vaccinium* sp.), hawthorne (*Crataegus* sp.), and strawberry bush (*Euonymus americanus*). The herb layer is well developed and includes partridgeberry (*Mitchella repens*), liverleaf (*Hepatica americana*), bloodroot (*Sanguinaria canadensis*), black cohosh, crane-fly orchid (*Tipularia discolor*), trillium (*Trillium catesbaei*), lousewort (*Pedicularis canadensis*), foamflower, and honewort (*Cryptotaenia canadensis*). Several areas with heartleaf (*Hexastylis* spp., probably *virginica*) are evident, and there is potential for the presence of the federally threatened dwarf-flowered heartleaf (*H. naniflora*). A sizable population (500-750 plants) of dwarf-flowered heartleaf has been documented in Connor Park, near the south end of the corridor.

The avian fauna of the site is diverse as a result of the wooded riparian corridor and the relatively large tracts of mature, contiguous forests along Lyle Creek. Great Blue Heron (*Ardea herodias*), Green-backed Heron (*Butorides striatus*), and Belted Kingfisher (*Megaceryle alcyon*) routinely use the corridor for foraging. A number of notable neotropical migrants associated with forest-interior conditions probably breed at the site, including the Wood Thrush, Yellow-throated Vireo, Worm-eating Warbler, Northern Parula, and Louisiana Waterthrush.

**MANAGEMENT AND PROTECTION:** Disturbed banks should be renaturalized and planted with native woody vegetation. Riparian buffer widths should be maximized to reduce siltation of the creek and to provide greater wildlife habitat. All forests adjacent to the creek should be protected from development and allowed to mature. The riparian zone and the mature forests along the creek should be first priority for protection. Additional forest lands should be protected if possible to increase the size of the contiguous woodlands adjacent to the creek. Protection could be in the form of conservation easements. Lands contained in Connor Park are protected.

**RARE AND NOTEWORTHY PLANTS:**

Dwarf-flowered Heartleaf (*Hexastylis naniflora*), T. A sizable population (500-750 plants) has been identified in Connor Park.

Trillium (*Trillium catesbaei*).

Galax (*Galax aphylla*).

Bloodroot (*Sanguinaria canadensis*).  
Liverleaf (*Hepatica americana*).

**RARE AND NOTEWORTHY ANIMALS:**

Wood Thrush (*Hylocichla mustelina*). Forest-interior species. Relatively uncommon in Catawba County. Probably breeding. Associated with rich deciduous or mixed forests, with well-developed understories.

Yellow-throated Vireo (*Vireo flavifrons*). Forest-interior species. Relatively uncommon in Catawba County. Possibly breeding or late migrant. Associated with tall trees near water.

Worm-eating Warbler (*Helmitheros vermivorus*). Forest-interior species. Probably breeding. Relatively uncommon in Catawba County. Associated with forests on steep slopes that have dense, broadleaf evergreen understories.

Northern Parula (*Parula americana*). Forest-interior species. Relatively uncommon in Catawba County. Probably breeding. Associated with bottomland forests, swamps, and streams.

Louisiana Waterthrush (*Seiurus motacilla*). Forest-interior species. Relatively uncommon in Catawba County. Probably breeding. Associated with deciduous forests, with rocky streams.

**REFERENCES:**

Hamel, P. B. 1992. The Land Manager's Guide to the Birds of the South. The Nature Conservancy, Southeastern Region, Chapel Hill, NC.

Rossell, C. R., Jr. 2002. Site Survey Report: Lyle Creek Corridor. N.C. Natural Heritage Program, DPR, DENR, Raleigh, NC.

Site Map Insert

## Catawba County Natural Area Inventory

### LYLE CREEK WETLAND Significant Natural Heritage Area

**Site Significance:** County  
**Quadrangles:** Catawba

**Size:** 12 acres  
**Ownership:** Private

**SIGNIFICANT FEATURES:** This is one of the few intact wetland complexes surveyed in Catawba County. It consists of a naturalized gravel pit and a Piedmont/Mountain Swamp Forest community, which is in good condition. The site provides habitat for aquatic and hydric species, and appears to be a high-quality breeding grounds for amphibians.

**GENERAL DESCRIPTION:** The site consists of a naturalized gravel pit and an adjacent Piedmont/Mountain Swamp Forest. It is located on the floodplain of Lyle Creek, within 0.25 mile of the confluence of Lyle Creek and the Catawba River. The Piedmont/Mountain Swamp Forest as well as the gravel pit provide habitat for aquatic and hydric species; both appear to be high-quality breeding grounds for amphibians.

The gravel pit has naturalized. Small canopy trees are scattered and generally limited to the edge of the pit, and shrubs and herbs occur in the littoral zone. Canopy trees consist of black willow (*Salix nigra*), river birch (*Betula nigra*), red maple (*Acer rubrum*), American sycamore (*Platanus occidentalis*), and willow oak (*Quercus phellos*). The understory is sparse and consists of transgressives. Shrubs also are sparse, except in areas dominated by button-bush (*Cephalanthus occidentalis*). The herb layer is confined to the edge and littoral zone and includes duck potato (*Sagittaria latifolia* var. *pubescens*), false nettle (*Boehmeria cylindrica*), Asiatic dayflower (*Commelina communis*), soft rush (*Juncus* sp.), bulrush (*Scirpus* sp.), and smartweed (*Polygonum* sp., prob. *punctatum*).

The Piedmont/Mountain Swamp Forest is adjacent to the gravel pit and contributes to the wetland complex. Areas within this lowland community are dry enough to support some mesic/xeric species. The canopy includes green ash (*Fraxinus pennsylvanica*), willow oak, river birch, sweet gum (*Liquidambar styraciflua*), red maple, box elder (*Acer negundo*), and sycamore. The understory is mixed with transgressives, and includes winged elm (*Ulmus alata*), persimmon (*Diospyros virginiana*), and hackberry (*Celtis laevigata*). Shrubs include cane (*Arundinaria gigantea*), rose (*Rosa* sp.), blackberry (*Rubus* sp.), and silky dogwood (*Cornus amomum*). Herbs are sparse and include trumpet-vine (*Campsis radicans*), grape vine (*Vitis rotundifolia*), poison ivy (*Toxicodendron radicans*), snakeroot (*Sanicula canadensis*), agrimony (*Agrimonia parviflora*), oats (*Uniola latifolia*), microstegium (*Microstegium vimineum*), and sedge (*Carex* sp., prob. *lupulina*).

**MANAGEMENT AND PROTECTION:** The quality of these communities greatly depends on maintaining current moisture regimes. Monitoring water levels and limiting human activity within the communities will aid in their protection. The use of chemicals should be discouraged

for maintaining an adjacent powerline right-of-way. Conservation easements should be obtained for the entire site.

**RARE AND NOTEWORTHY PLANTS:** None.

**RARE AND NOTEWORTHY ANIMALS:** None.

**REFERENCES:**

Rossell, C. R., Jr. 2002. Site Survey Report: Lyle Creek Wetland. N.C. Natural Heritage Program, DPR, DENR, Raleigh, NC.

Site Map Insert

## Catawba County Natural Area Inventory

### MURRAY'S MILL LAKE AND UPPER BALLS CREEK Significant Natural Heritage Area

**Site Significance:** Regional  
**Quadrangles:** Catawba

**Size:** 101 acres  
**Ownership:** Private

**SIGNIFICANT FEATURES:** Several populations (with 250-1250 plants) of the federally threatened dwarf-flowered heartleaf (*Hexastylis naniflora*) occur within the site. The site contains a rich faunal component, including many uncommon neotropical migrants as a result of the diversity of aquatic and terrestrial habitats. The section of Balls Creek below the dam has excellent water quality and contains two species of freshwater mussels that are relatively uncommon in Catawba County. A fairly large contiguous forest includes fair examples of a Dry-Mesic Oak-Hickory Forest and a small Chestnut Oak Forest.

**GENERAL DESCRIPTION:** The site consists of Murray's Mill Lake and the surrounding woodlands. It also includes a wooded riparian corridor and adjacent slopes of upper Balls Creek, just below Murray's Mill dam to a point approximately 0.5-0.75 miles downstream. The site contains fair examples of a Dry-Mesic Oak-Hickory Forest as well as several areas of Dry Oak-Hickory Forests. There is also a small tract of Chestnut Oak Forest on the ridge at the east end of the corridor.

Waters of this section of Balls Creek are classified WS-IV (waters used as potable in highly developed watersheds; waters were rated by NC Division of Water Quality in 1992). These waters represent the best quality waters of any stream observed during the inventory. Several intermittent to slow flowing headwater streams occur in the corridor. Two species of freshwater mussels occur in Balls Creek, the eastern elliptio (*Elliptio complanata*) and the eastern floater (*Pyganodon cataracta*). Both species are relatively common in the Piedmont and Coastal Plain, but uncommon in Catawba County. Balls Creek was the only stream in the inventory that contained native mussels. The relatively wide vegetated floodplain along Balls Creek provides an excellent buffer against siltation entering the creek. In addition, Murray's Mill Lake acts as a sedimentation basin for all waters upstream of the site.

The Dry-Mesic Oak-Hickory Forest occurs primarily along Balls Creek. However, the community is not well defined along the creek, and the dominant species adjacent to the creek is river birch (*Betula nigra*). The Dry-Mesic Oak-Hickory Forest has many features similar to an alluvial forest, but the species composition more resembles that of an Oak-Hickory Forest, with both mesic and xeric species represented. Dense areas of mountain laurel (*Kalmia latifolia*) add montane characteristics. The Dry-Mesic Oak-Hickory Forest extends into the lower- and mid-slopes. The canopy is dominated by yellow poplar (*Liriodendron tulipifera*), white oak (*Quercus alba*), red oak (*Quercus rubra*), and sourwood (*Oxydendrum arborea*). Also dominant are scarlet oak (*Quercus coccinea*) and pignut hickory (*Carya glabra*), with white oak occurring in more xeric areas. The understory is fairly well developed and includes red maple (*Acer*

*rubrum*), flowering dogwood (*Cornus florida*), black gum (*Nyssa sylvatica*), persimmon (*Diospyros virginiana*), American beech (*Fagus grandifolia*), sassafras (*Sassafras albidum*), and ironwood (*Carpinus caroliniana*). The shrub density is generally thick and is dominated by mountain laurel, but also contains some strawberry bush (*Euonymus americanus*). Yellowroot (*Xanthorhiza simplicissima*) and cane (*Arundinaria gigantea*) are supported along the creek. The herb layer is relatively sparse due to the dense shrub layer. Herbs include partridgeberry (*Mitchella repens*), Virginia creeper (*Parthenocissus quinquefolia*), muscadine (*Vitis rotundifolia*), greenbrier (*Smilax* spp.), Christmas fern (*Polystichum acrostichoides*), New York fern (*Thelypteris noveboracensis*), rattlesnake plantain (*Goodyera pubescens*), and spotted wintergreen (*Chimaphila maculata*). False nettle (*Boehmeria cylindrica*) and jewelweed (*Impatiens* sp.) are associated with the invasive microstegium (*Microstegium vimineum*) in moist areas. Several areas with heartleaf (*Hexastylis* sp.) are evident, and there is potential for the presence of the federally threatened dwarf-flowered heartleaf (*H. naniflora*). Several populations of *H. naniflora* have been documented within the site.

The fauna of the site is diverse. Murray's Mill Lake contains a high quality littoral zone that provides breeding habitat for wood ducks (*Aix sponsa*) and several species of frogs and turtles. In addition, the lake is surrounded by a narrow band of mature woods (dominated by oaks) that is adjacent to a variety of different types of agricultural fields (hay, grain, and corn). This creates a diverse mosaic of habitats attractive to wildlife, particularly those species associated with edge habitats. Several notable neotropical migrant bird species that are edge specialists probably breed on site, including the Common Yellowthroat (*Geothlypis trichas*), Orchard Oriole (*Icterus spurius*), and Blue Grosbeak (*Guiraca caerulea*). The relatively large contiguous tract of forest below the dam further enhances the diversity of the site by providing habitat for species requiring forest-interior conditions. Notable neotropical migrants that use this area include the Wood Thrush (*Hylocichla mustelina*), Yellow-throated Vireo (*Vireo flavifrons*), Blue-headed Vireo (*Vireo solitarius*), Summer Tanager (*Piranga rubra*), Scarlet Tanager (*Piranga olivacea*), and Rose-breasted Grosbeak (*Pheucticus ludovicianus*).

**MANAGEMENT AND PROTECTION:** Riparian buffers along Balls Creek need to be maintained and their widths maximized to reduce siltation of the creek and to provide wildlife habitat. All forests within the site should be protected and allowed to mature. Dredging and clearing of the riparian vegetation of Balls Creek above the lake needs to be stopped as soon as possible. Dredging of the creek is currently underway across from Shiloh Church. Conservation easements of the riparian zone of Balls Creek need to be obtained from the headwaters of Balls Creek to at least the end of the site below the dam. Additional easements should be obtained for the upland forests adjacent to the creek to preserve the integrity of the site for species requiring forest-interior conditions.

**RARE AND NOTEWORTHY PLANTS:**

Dwarf-flowered Heartleaf (*Hexastylis naniflora*), T. Several populations have been identified within this site.

**RARE AND NOTEWORTHY ANIMALS:**

Eastern Elliptio (*Elliptio complanata*). Freshwater mussel in Balls Creek identified by C. McGrath, NCWRC. Only observation of this species in Catawba County. Associated with a wide variety of habitats and thought to have a high environmental tolerance.

Eastern Floater (*Pyganodon cataracta*). Freshwater mussel in Balls Creek identified by C. McGrath, NCWRC. Only observation of this species in Catawba County. Associated with small streams, rivers, and lakes. It is usually found in slowing-moving waters, in sandy or muddy substrates. Considered a biomonitor of aquatic habitats.

Wood Thrush (*Hylocichla mustelina*). Forest-interior species. Relatively uncommon in Catawba County. Probably breeding. Associated with rich deciduous or mixed forests, with well-developed understories.

Yellow-throated Vireo (*Vireo flavifrons*). Forest-interior species. Relatively uncommon in Catawba County. Possibly breeding or late migrant. Associated with tall deciduous trees in open woods near water.

Blue-headed Vireo (*Vireo solitarius*). Forest-interior species. Relatively uncommon in the Piedmont and occurs mainly in the mountains. Possible breeding or late migrant. Associated with middle-aged to mature forests.

Common Yellowthroat (*Geothlypis trichas*). Early-successional species. Relatively uncommon in Catawba County. Probably breeding. Associated with moist habitats containing shrubs and saplings.

Summer Tanager (*Piranga rubra*). Forest-interior species. Relatively uncommon in Catawba County. Probably breeding. Associated with open to medium-growth forests on dry sites.

Orchard Oriole (*Icterus spurius*). Edge species. Relatively uncommon in Catawba County. Probably breeding. Associated with scattered hardwoods in open country.

Blue Grosbeak (*Guiraca caerulea*). Old field species. Relatively uncommon in Catawba County. Probably breeding. Associated with abandoned fields containing shrubs and saplings.

Rose-breasted Grosbeak (*Pheucticus ludovicianus*). Forest-interior Species. Relatively uncommon in the Piedmont, occurs mainly in the mountains. Probably breeding or late migrant. Associated with mature hardwood forests.

## **REFERENCES:**

- Hamel, P. B. 1992. The Land Manager's Guide to the Birds of the South. The Nature Conservancy, Southeastern Region, Chapel Hill, NC.
- Nedeau, E. J., M. A. McCollough, and B. I. Swartz. 2000. The Freshwater Mussels of Maine. Maine Department of Inland Fisheries and Wildlife, Augusta, ME.
- Rossell, C. R., Jr. 2002. Site Survey Report: Murray's Mill Lake and Upper Balls Creek. N.C. Natural Heritage Program, DPR, DENR, Raleigh, NC.

## Site Map Insert

## Catawba County Natural Area Inventory

### TERRAPIN CREEK CORRIDOR Significant Natural Heritage Area

**Site Significance:** County

**Size:** 61 acres

**Quadrangles:** Catawba and Troutman

**Ownership:** Private

**SIGNIFICANT FEATURES:** The site is an intact wooded corridor along Terrapin Creek. It contains a good quality Piedmont/Low Mountain Alluvial Forest and a fair quality Dry-Mesic Oak-Hickory Forest. Waters of Terrapin Creek at the east end of the site are classified as WS-IV Critical Area by the North Carolina Division of Water Quality. The site protects the waters of Lake Norman and provides habitat for wildlife, including many bird species that are uncommon in Catawba County.

**GENERAL DESCRIPTION:** The site is a wooded corridor that includes the floodplain and slopes of Terrapin Creek. Boundaries were drawn to include only the intact alluvial and mesic forest communities. The site begins < 0.5 mile from the headwaters of Terrapin Creek and ends at the confluence of Lake Norman. A good quality Piedmont/Low Mountain Alluvial Forest occurs along the floodplain of the creek and a fair quality Dry-Mesic Oak-Hickory Forest occurs on the slopes. The site is buffered by a fairly large tract of heavily cutover woods dominated by scrub pine (*Pinus virginia*) and oaks (*Quercus* spp.).

The waters of Terrapin Creek are classified WS-IV (waters used as potable in highly developed watersheds; waters were rated by NC Division of Water Quality in 1992). An additional classification of CA (waters that flow through a Critical Area) is assigned to Terrapin Creek from the mouth of Lake Norman to a point 0.5 mile upstream. Several headwater streams feed Terrapin Creek within the site. Terrapin Creek and its tributaries have good water quality and low turbidity. Their bottoms consist of sand and gravel, with some exposed bedrock in Terrapin Creek. Many of Terrapin Creek's banks are undercut as a result of its meandering nature. These banks provide good cover and habitat for a variety of aquatic animals, including fish and amphibians.

Disturbance of the riparian zone along the creek is minimal up to a powerline right-of-way located approximately 0.5 mile from the confluence of the creek and Lake Norman (at the bridge on Molly's Backbone Road). The riparian zone along the right-of-way consists of thick shrubs and saplings, with all the canopy trees removed. The corridor further downstream was not surveyed because of a lack of landowner permission, but was included in the site because of the Critical Area designation by the Division of Water Quality.

The Piedmont/Low Mountain Alluvial Forest along the floodplain of the creek supports a canopy of river birch (*Betula nigra*), black walnut (*Juglans nigra*), yellow poplar (*Liriodendron tulipifera*), sweetgum (*Liquidambar styraciflua*), and American beech (*Fagus grandifolia*). The understory consists of ironwood (*Carpinus caroliniana*), red mulberry (*Morus rubra*), hackberry

(*Celtis laevigata*), flowering dogwood (*Cornus florida*), sourwood (*Oxydendrum arborea*), green ash (*Fraxinus pennsylvanica*), and red maple (*Acer rubrum*). The shrub layer is well developed, varies in density, and includes American holly (*Ilex opaca*), privet (*Ligustrum sinense*), spicebush (*Lindera benzoin*), cane (*Arundinaria gigantea*), and hazelnut (*Corylus* sp.). The herb layer is diverse and supports Japanese honeysuckle (*Lonicera japonica*), trumpet-vine (*Campsis radicans*), rattlesnake fern (*Botrychium virginianum*), ebony spleenwort (*Asplenium platyneuron*), microstegium (*Microstegium vimineum*), Virginia knotweed (*Tovara virginiana*), coneflower (*Rudbeckia lacinata*), hoary mountain-mint (*Pycnanthemum incanum*), indian tobacco (*Lobelia inflata*), elephant's foot (*Elephantopus carolinianus*), snakeroot (*Sanicula canadensis*), clearweed (*Pilea pumila*), and jewelweed (*Impatiens capensis*).

The Dry-Mesic Oak-Hickory Forest on the slopes generally has fewer mesic attributes than is normally attributed to this forest type. However, the overall assemblages and dominants of this community lead to this classification. The canopy consists of white oak (*Quercus alba*), southern-red oak (*Q. falcata*), sweet pignut hickory (*Carya ovalis*), scrub pine (*Pinus virginiana*), short-leaf pine (*P. echinata*), yellow poplar, American beech, and a few scattered white pine (*Pinus strobus*). The understory is sparse and includes red maple, flowering dogwood, sourwood, black gum (*Nyssa sylvatica*), and red mulberry. Shrubs are also sparse and consist of hawthorne (*Crataegus flabellata*), strawberry bush (*Euonymus americanus*), American holly, blueberry (*Vaccinium* sp.), and sassafras (*Sassafras albidum*). Herbs include grape vine (*Vitis rotundifolia*), greenbrier (*Smilax* sp.), wild yam (*Dioscorea villosa*), Christmas fern (*Polystichum acrostichoides*), spotted wintergreen (*Chimaphila maculata*), rattlesnake plantain (*Goodyera pubescens*), and poke weed (*Phytolacca americana*).

The site provides high quality habitat for a variety of wildlife, including many neotropical migrant bird species that are relatively uncommon in Catawba County. These include the Wood Thrush (*Hylocichla mustelina*), Blue-headed Vireo (*Vireo solitarius*), Northern Parula (*Parula americana*), Hooded Warbler (*Wilsonia citrina*), Louisiana Waterthrush (*Seiurus motacilla*), Ovenbird (*Seiurus aurocapillus*), and Summer Tanager (*Piranga rubra*). These species are all associated with forest-interior conditions, and many are indicative of rich woods and well-developed understories.

**MANAGEMENT AND PROTECTION:** All forests should be allowed to mature. Conservation easements should be obtained for the riparian zone and slopes to protect the water quality of Terrapin Creek and Lake Norman. Ideally, easements should be acquired for the headwaters of Terrapin Creek to the confluence with Lake Norman. Consideration also should be given to protecting the surrounding cutover areas to maximize the extent of undeveloped forests and to increase the quality of habitat for species associated with forest-interior conditions.

**RARE AND NOTEWORTHY PLANTS:** None.

**RARE AND NOTEWORTHY ANIMALS:**

Wood Thrush (*Hylocichla mustelina*). Forest-interior species. Relatively uncommon in

Catawba County. Probably breeding. Associated with rich deciduous or mixed forests, with well-developed understories.

Blue-headed Vireo (*Vireo solitarius*). Forest-interior species. Relatively uncommon in the Piedmont and occurs mainly in the mountains. Possibly breeding or a late migrant. Associated with middle-aged to mature forests.

Northern Parula (*Parula americana*). Forest Interior Species. Relatively uncommon in Catawba County. Probably breeding. Generally associated with streams and bottomland forests.

Hooded Warbler (*Wilsonia citrina*). Forest-interior species. Relatively uncommon in Catawba County. Probably breeding. Associated with deciduous forests, with rich understories.

Louisiana Waterthrush (*Seiurus motacilla*). Forest-interior species. Relatively uncommon in Catawba County. Probably breeding. Associated with deciduous forests, with rocky streams.

Ovenbird (*Seiurus aurocapillus*). Forest-interior species. Relatively uncommon in Catawba County. Probably breeding. Associated with upland forests, with moderate understories.

Summer Tanager (*Piranga rubra*). Forest-interior species. Relatively uncommon in Catawba County. Probably breeding. Associated with open, medium-growth forests on dry sites.

#### **REFERENCES:**

Hamel, P. B. 1992. The Land Manager's Guide to the Birds of the South. The Nature Conservancy, Southeastern Region, Chapel Hill, NC.

Rossell, C. R., Jr 2002. Site Survey Report: Terrapin Creek Corridor. N.C. Natural Heritage Program, DPR, DENR, Raleigh, NC.

Site Map Insert

## Catawba County Natural Area Inventory

### LAKE NORMAN SLOPES AND SHORELINE Significant Natural Heritage Area

**Site Significance:** County

**Size:** 286 acres

**Quadrangles:** Lake Norman North

**Ownership:** Private

**SIGNIFICANT FEATURES:** The site is one of the last undeveloped sections of shoreline on Lake Norman. It contains a fair quality Dry Oak-Hickory Forest and a good quality Piedmont/Low Mountain Alluvial Forest. It also contains high quality aquatic habitats and littoral zones. Several bird species uncommon in Catawba County utilize the site for foraging, including Osprey (*Pandion haliaetus*), Black Vulture (*Coragyps atratus*), and Fish Crow (*Corvus ossifragus*). The highfin carpsucker (*Carpoides velifer*), a state listed species of special concern, also may utilize the aquatic habitats of this site, as it was captured near the site in 1991.

**GENERAL DESCRIPTION:** The site consists of the undeveloped shoreline and lower slopes along the northwest side of Lake Norman, just north of NC 150 and Holdsclaw Creek. The shoreline is irregular in shape and contains several coves with good littoral zones that provide productive aquatic habitats and fisheries. The waters of this portion of Lake Norman are classified as WS-IV Critical Area. Forests along the lower slopes are second growth, and vary from low-quality timbered areas dominated by pine to a fair quality Dry Oak-Hickory Forest and a good quality Piedmont/Low Mountain Alluvial Forest. Two headwater streams flow into Lake Norman within the site. The streams are slow flowing, with sandy bottoms. Water quality of both streams and Lake Norman appears to be good.

The Piedmont/Low Mountain Alluvial Forest occurs along one of the headwater streams and has been identified as a sensitive area by Duke Power. The forest is confined to an area surrounding the stream and grades into an oak-hickory forest as the slope increases. The canopy consists of river birch (*Betula nigra*), red maple (*Acer rubrum*), American beech (*Fagus grandifolia*), yellow poplar (*Liriodendron tulipifera*), black walnut (*Juglans nigra*), and loblolly pine (*Pinus taeda*). The understory is sparse and includes sourwood (*Oxydendrum arborea*), mockernut hickory (*Carya tomentosa*), and a few scattered white pine (*Pinus strobus*). The shrub layer is also sparse and includes American holly (*Ilex opaca*) and strawberry bush (*Euonymus americanus*). The herb layer consists of running pine (*Lycopodium flabelliforme*), Christmas fern (*Polystichum acrostichoides*), partridgeberry (*Mitchella repens*), false nettle (*Boehmeria cylindrica*), and arrowleaf heartleaf (*Hexastylis arifolia*). There also is the potential for the existence of the federally threatened dwarf-flowered heartleaf (*Hexastylis naniflora*).

A Dry Oak-Hickory Forest occurs along the shoreline of Lake Norman. The forest has a large pine component, and past timbering is evident in areas dominated by loblolly pine. The canopy is mixed and supports loblolly pine, white oak (*Q. alba*), southern red oak (*Q. falcata*), red oak (*Q. rubra*), bitternut hickory (*Carya cordiformis*), mockernut hickory, yellow poplar, sweetgum (*Liquidambar styraciflua*), and short-leaf pine (*Pinus echinata*). Persimmon (*Diospyros*

*virginiana*), black walnut, and willow oak (*Quercus phellos*) occur in the lower, mesic areas. The understory consists of black jack oak (*Quercus marilandica*), post oak (*Q. stellata*), water oak (*Q. nigra*), sourwood, scrub pine (*Pinus virginiana*), and black gum (*Nyssa sylvatica*). Red maple, river birch, hackberry (*Celtis laevigata*), and ironwood (*Carpinus caroliniana*) occur near the shoreline. Shrubs include red mulberry (*Morus rubra*), American holly (*Ilex opaca*), sassafras (*Sassafras albidum*), and privet (*Ligustrum sinense*), with silky dogwood (*Cornus amomum*), tag alder (*Alnus serrulata*), and buttonbush (*Cephalanthus occidentalis*) close to the water. Herbs are sparse, especially in areas dominated by pine. Species include poison ivy (*Toxicodendron radicans*), fox grape (*Vitis labrusca*), trumpet-vine (*Campsis radicans*), Japanese honeysuckle (*Lonicera japonica*), ebony spleenwort (*Asplenium platyneuron*), rattlesnake fern (*Botrychium virginianum*), snakeroot (*Sanicula canadensis*), arrowleaf heartleaf, microstegium (*Microstegium vimineum*), and wingstem (*Verbesina occidentalis*).

The number of birds and other animals recorded at the site was lower than expected because surveys were conducted on an extremely hot day. However, several uncommon bird species use the site for foraging, including Osprey (*Pandion haliaetus*), Black Vulture (*Coragyps atratus*), and Fish Crow (*Corvus ossifragus*). The highfin carpsucker (*Carpoides velifer*), a state listed species of special concern, also may utilize the aquatic habitats of this site, as this species was captured in the area in 1991.

**MANAGEMENT AND PROTECTION:** The forests adjacent to the shoreline are fairly extensive but heavily cutover. Recommendations are to allow these forests to mature. It is also suggested to continue the no hunting, fishing, or camping regulations established by the NCWRC to help maintain the integrity of the site. Protection could be in the form of conservation easements obtained from Duke Power to protect the shoreline and adjacent forests.

**RARE AND NOTEWORTHY PLANTS:** None.

**RARE AND NOTEWORTHY ANIMALS:**

Highfin Carpsucker (*Carpoides velifer*). SC. This species was recorded in 1991 in Lake Norman near the site.

Osprey (*Pandion haliaetus*). Piscivorous bird of prey. Four individuals observed flying above Lake Norman. Uncommon in Catawba County. Associated with open water with large structures for nesting.

Black Vulture (*Coragyps atratus*). SC. Five individuals observed soaring above Lake Norman. Uncommon in Catawba County. Usually nests in remote woodlands.

Fish Crow (*Corvus ossifragus*). Several observed around the shoreline of Lake Norman. Uncommon in Catawba County. This was the only observation of this species during the survey.

**REFERENCES:**

- Hamel, P. B. 1992. The Land Manager's Guide to the Birds of the South. The Nature Conservancy, Southeastern Region, Chapel Hill, NC.
- Rossell, C. R., Jr. 2002. Site Survey Report: Lake Norman Slopes and Shoreline. N.C. Natural Heritage Program, DPR, DENR, Raleigh, NC.

Site Map Insert

## **APPENDIX I.** Explanation of rank codes for natural community types.

### NC Rank

- S1 = Critically imperiled in North Carolina because of extreme rarity or because of some factor making it especially vulnerable to degradation or destruction in the state.
- S2 = Imperiled in North Carolina because of rarity or because of some factor making it very vulnerable to degradation or destruction in the state.
- S3 = Rare or uncommon in North Carolina.
- S4 = Apparently secure in the state, with many occurrences.
- S5 = Demonstrably secure in the state.
- S? = Unranked, or rank uncertain.

### Global Rank

- G1 = Critically imperiled globally because of extreme rarity or because of some factor making it especially vulnerable to degradation or destruction.
- G2 = Imperiled globally because of rarity or because of some factor making it vulnerable to degradation or destruction.
- G3 = Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range or because of other factors making it vulnerable to degradation or destruction.
- 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.
- G? = Unranked, or rank uncertain.
- T\_ = The rank of a subtype. As an example, G4T1 would apply to a subtype of a community with an overall rank of G4, but the subtype warranting a rank of G1.

## **APPENDIX II.** Definitions of status and rank codes for rare plants.

### N.C. Status:

E = Endangered, T = Threatened, SC = Special Concern, C = Candidate, SR = Significantly Rare. Plant statuses are determined by the Plant Conservation Program, N.C. Department of Agriculture, and the NC NHP. Collection from wild Endangered, Threatened, and Special Concern species is regulated by state law. The Candidate and Significantly Rare statuses are NC NHP designations indicating the need for population monitoring and possible conservation action for species not currently listed as Endangered, Threatened, or Special Concern.

### U.S. Status:

E = Endangered. A plant that is in danger of extinction throughout all or a significant portion of its range.

T = Threatened. A plant that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

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 endangered or threatened species.

FSC = Federal Species of Concern. This status replaces the former "Category 2" Candidate status used by the U.S. Fish and Wildlife Service. Category 2 plants were those for which there was some evidence of vulnerability, but for which there were not enough data to support listing as Endangered or Threatened. The FSC code has no official status.

P\_ = Proposed. Species proposed in the *Federal Register* as a status different from its current status.

### N.C. Rank:

S1 = Critically imperilled in North Carolina because of extreme rarity or because of some factor making it especially vulnerable to extirpation from the state. Typically 1-5 populations.

S2 = Imperilled in North Carolina because of rarity or because of some factor making it very vulnerable to extirpation from the state. Typically 6-20 populations.

S3 = Rare or uncommon in North Carolina. Typically 21-100 populations.

SH = Of historical occurrence in North Carolina, not having been verified in more than 20 years, and suspected to be still extant.

### Global Rank:

G1 = Critically imperilled globally because of extreme rarity or because of some factor making it especially vulnerable to extinction throughout its range. Typically 5 or fewer occurrences globally.

G2 = Imperilled globally because of rarity or because of some factor making it very vulnerable to extinction throughout its range. Typically 6-20 occurrences globally.

G3 = Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range or because of other factors making it vulnerable to extinction throughout its range. Typically 21-100 occurrences globally.

**APPENDIX II.** Continued.

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.

Q = Questionable taxonomic assignment.

T = The rank of a subspecies or variety. For example, G4T1 would apply to a subspecies or variety of a species with an overall rank of G4, but with the subspecies or variety warranting a rank of G1.

? = Unranked, or rank uncertain.

U = Possibly in peril range-wide, but status uncertain.

An S or G rank involving two numbers indicates uncertainty of rank. For instance, a G2G3 rank indicates that the species appears to warrant either a G2 or a G3 ranking, but that existing data do not allow that determination to be made.

### **APPENDIX III.** Definitions of status and rank codes for rare animals.

#### N.C. Status:

E = Endangered, T = Threatened, SC = Special Concern, SR = Significantly Rare. Animal statuses are determined by the N.C. Wildlife Resources Commission and the NC NHP.

Endangered, Threatened, and Special Concern species are afforded some protection by state law (the Endangered and Threatened Wildlife and Wildlife Species of Special Concern Act, 1987).

The Significantly Rare status is a NC NHP designation indicating rarity and the need for population monitoring and possible conservation action for species not currently listed as Endangered, Threatened, or Special Concern.

#### U.S. Status:

E = Endangered. An animal that is in danger of extinction throughout all or a significant portion of its range.

T = Threatened. An animal that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

FSC = Federal Species of Concern. This status replaces the former "Category 2" Candidate status used by the U.S. Fish and Wildlife Service. Category 2 animals were those for which there was some evidence of vulnerability, but for which there were not enough data to support listing as Endangered or Threatened. The FSC code has no official status.

P\_ = Proposed. Species proposed in the *Federal Register* as a status different from its current Federal status.

D = De-listed. Species has been proposed by the U.S. Fish and Wildlife Service for de-listing from the list of Endangered and Threatened Wildlife.

#### N.C. Rank:

S1 = Critically imperilled in North Carolina because of extreme rarity or because of some factor making it especially vulnerable to extirpation from the state. Typically 1-5 populations.

S2 = Imperilled in North Carolina because of rarity or because of some factor making it very vulnerable to extirpation from the state. Typically 6-20 populations.

S3 = Rare or uncommon in North Carolina. Typically 21-100 populations.

SH = Of historical occurrence in North Carolina, not having been verified in more than 20 years, and suspected to be still extant.

SU = Possibly in peril in North Carolina but status uncertain; need more information.

S\_B (e.g., S2B) = Rank of the breeding population in the state (for migratory species only). In the example provided, "S2B", the breeding population has a state rank of S2, regardless of the rank of the non-breeding population.

S\_N = Rank of the non-breeding population in the state (for migratory species only).

\_Z\_ (e.g., SZN) = Population is not of significant conservation concern. In the example provided, "SZN", the non-breeding population is not of significant conservation concern.

**APPENDIX III.** Continued.

Global Rank:

G1 = Critically imperiled globally because of extreme rarity or because of some factor making it especially vulnerable to extinction throughout its range. Typically 5 or fewer occurrences globally.

G2 = Imperiled globally because of rarity or because of some factor making it very vulnerable to extinction throughout its range. Typically 6-20 occurrences globally.

G3 = Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range or because of other factors making it vulnerable to extinction

throughout its range. Typically 21-100 occurrences globally.

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.

T = The rank of a subspecies or variety. For example, G4T1 would apply to a subspecies or variety of a species with an overall rank of G4, but with the subspecies or variety warranting a rank of G1.

GH or TH = Historical occurrences only through its range, with the expectation that it may be rediscovered (GH for a species, TH for a subspecies or variety).

GU = Possibly in peril range-wide, but status uncertain; more information is needed.

? = Unranked, or rank uncertain.

An S or G rank involving two numbers indicates uncertainty of rank. For instance, a G2G3 rank indicates that the species appears to warrant either a G2 or a G3 ranking, but that existing data do not allow that determination to be made.

## **APPENDIX IV. Biological surveys and endangered species laws.**

### **BIOLOGICAL SURVEYS AND ENDANGERED SPECIES LAWS**

Obtaining landowner permission to survey is an integral part of biological inventory. Occasionally, however, permission to survey on private lands is not granted due to a belief that if a rare species is discovered, restrictions and land-use limitations will be imposed. Clearly, when this occurs the search for scientific information is hindered. A secondary effect of not granting permission to survey is that owners of lands that are biologically significant do not learn about the conservation options and tax incentives that are available to them. Those who grant permission and are found to own significant lands are given results from the biological survey and, if they wish, are put in contact with an appropriate conservation organization, or are made aware of other management or protection options.

In reality, there is very little reason for landowners to have concerns about the presence of rare species on their land. A summary of federal and state endangered species laws relevant to private landowners was recently prepared by Mark A. Cantrell of the U.S. Fish & Wildlife Service and Kenneth A. Bridle, Ph.D. of the Piedmont Land Conservancy in Greensboro, North Carolina. Some of that information is presented below to help dispel concerns landowners may have about rare species and to provide clarification on potential land-use restrictions.

#### **FEDERAL LAW**

1. The Endangered Species Act (ESA) protects only plants and animals that are federally listed as Endangered or Threatened. Since federally listed species are by definition very rare, the likelihood of their occurring on a given tract of private land is generally very small.
2. The ESA does protect federally listed animal species from the potentially harmful actions of private landowners. Because this may lead to restrictions on their use of lands, Congress, the U.S. Fish & Wildlife Service (USFWS), and a variety of partners have worked to develop flexible tools for resolving conflicts. These tools include Section 10 permits, such as habitat conservation plans, safe harbor agreements, and candidate conservation agreements. Federal funds are also available to assist landowners with management and conservation of listed and candidate species on their lands.
3. Engaging in trade in a federally listed species without a permit is illegal for both plants and animals. "Taking" (i.e., harassing, harming, pursuing, hunting, killing, or trapping) or illegally possessing federally listed animals is a violation of the ESA. Removing, digging up, cutting, damaging, or destroying a federally listed plant on public land, or on private land without the owner's permission, is illegal.

#### **APPENDIX IV. Continued.**

4. Through the habitat conservation planning process, the USFWS may issue a permit so that private landowners can lawfully “take” a federally listed animal species if it is “incidental to and not the purpose of carrying out otherwise lawful activities.” These permits are available as long as the landowner implements an approved conservation plan for the species, and the “taking” does not jeopardize the continued existence of the species. A private landowner is not required to prepare a conservation plan for the “taking” of federally listed plant species as long as the activity does not involve federal funding or permitting.

5. Under the ESA, private developers can obtain permits to legally harm or even kill federally listed species on their property provided that they show that attempts were made to minimize their impact on the species in other ways.

6. The existence of a federally listed plant species on private property legally has no effect on the landowner unless a project requires a federal permit or uses federal funds and will clearly result in the taking of a listed plant species. Landowners, individuals, and agencies are prohibited from taking endangered animals without authorization, whether the action is private or federally funded.

7. When critical habitat is designated for federally listed species, it applies only to federal actions, and not to the non-federal actions of private landowners.

#### **STATE LAW**

1. North Carolina endangered species laws apply to species listed by the state as endangered or threatened.

2. The plant and animal endangered species laws are modelled after the ESA, in that it prohibits illegal trafficking or poaching of listed species.

3. The state endangered animal species law states that “no rule may be adopted that restricts use or development of private property.”

4. The state endangered plant species law specifically states that “the incidental disturbance of protected plants during agricultural, forestry or development operations is not illegal so long as the plants are not collected for sale or commercial use.”

**APPENDIX V.** List of animals observed at Significant Natural Heritage Areas.

**Henry Fork River Slopes**

Amphibians

Gray Tree Frog (*Hyla chrysoscelis*)

Reptiles

Eastern Box Turtle (*Terrapene carolina*)

Birds

Wild Turkey (*Meleagris gallopavo*)

Yellow-billed Cuckoo (*Coccyzus americanus*)

Ruby-throated Hummingbird (*Archilochus colubris*)

Pileated Woodpecker (*Dryocopus pileatus*)

Red-bellied Woodpecker (*Melanerpes carolinus*)

Acadian Flycatcher (*Empidonax vireescens*)

Blue Jay (*Cyanocitta cristata*)

Carolina Chickadee (*Parus carolinensis*)

Tufted Titmouse (*Parus bicolor*)

Carolina Wren (*Thryothorus ludovicianus*)

Blue-gray Gnatcatcher (*Polioptila caerulea*)

Red-eyed Vireo (*Vireo olivaceus*)

Northern Parula (*Parula americana*)

American Redstart (*Setophaga ruticilla*)

Northern Cardinal (*Cardinalis cardinalis*)

Mammals

Eastern Gray Squirrel (*Sciurus carolinensis*)

Raccoon (*Procyon lotor*)

**Baker Mountain**

Amphibians

Gray Treefrog (probably *Hyla chrysoscelis*; but possibly *H. versicolor*)

Reptiles

Eastern Fence Lizard (*Sceloporus undulatus*)

Five-lined Skink (*Eumeces fasciatus*)

Black Racer (*Coluber constrictor*)

Birds

Wild Turkey (*Meleagris gallopavo*)

Ruffed Grouse (*Bonasa umbellus*)

Sharp-shinned Hawk (*Accipiter striatus*)

Red-tailed Hawk (*Buteo jamaicensis*)

Turkey Vulture (*Cathartes aura*)

Mourning Dove (*Zenaida macroura*)

Yellow-billed Cuckoo (*Coccyzus americanus*)

Pileated Woodpecker (*Dryocopus pileatus*)

**APPENDIX V.** Continued.

Red-bellied Woodpecker (*Melanerpes carolinus*)  
Downy Woodpecker (*Picoides pubescens*)  
Hairy Woodpecker (*Picoides villosus*)  
Great Crested Flycatcher (*Myiarchus crinitus*)  
Chimney Swift (*Chaetura pelagica*)  
American Crow (*Corvus brachyrhynchos*)  
Blue Jay (*Cyanocitta cristata*)  
Carolina Chickadee (*Parus carolinensis*)  
Tufted Titmouse (*Parus bicolor*)  
White-breasted Nuthatch (*Sitta carolinensis*)  
Carolina Wren (*Thryothorus ludovicianus*)  
Blue-gray Gnatcatcher (*Poliophtila caerulea*)  
Brown Thrasher (*Taxostoma rufum*)  
Hermit Thrush (*Catharus guttatus*), SR  
Wood Thrush (*Hylocichla mustelina*)  
Red-eyed Vireo (*Vireo olivaceus*)  
Blue-headed Vireo (*Vireo solitarius*)  
Black-throated Green Warbler (*Dendroica virens*)  
Black-and-white Warbler (*Mniotilta varia*)  
Black-throated Blue Warbler (*Dendroica caerulescens*)  
American Redstart (*Setophaga ruticilla*)  
Pine Warbler (*Dendroica pinus*)  
Worm-eating Warbler (*Helmitheros vermivorus*)  
Hooded Warbler (*Wilsonia citrina*)  
Ovenbird (*Seiurus aurocapillus*)  
Summer Tanager (*Piranga rubra*)  
Scarlet Tanager (*Piranga olivacea*)  
Northern Cardinal (*Cardinalis cardinalis*)  
American Goldfinch (*Carduelis tristis*)  
Indigo Bunting (*Passerina cyanea*)  
Rose-breasted Grosbeak (*Pheucticus ludovicianus*)  
Rufous-sided Towhee (*Pipilo erythrophthalmus*)  
Mammals  
Eastern Chipmunk (*Tamias striatus*)  
Eastern Gray Squirrel (*Sciurus carolinensis*)  
Raccoon (*Procyon lotor*)  
Red Fox (*Vulpes vulpes*)  
White-tailed Deer (*Odocoileus virginianus*)

**APPENDIX V.** Continued.

**Jacob Fork West Corridor**

Amphibians

Green Frog (*Rana clamitans*)

Reptiles

Gulf Coast Spiny Softshell (*Apalone spinifera aspera*)

Northern Water Snake (*Nerodia sipedon*)

Black Rat Snake (*Elaphe obsoleta*)

Birds

Wood Duck (*Aix sponsa*)

Great Blue Heron (*Ardea herodias*)

Killdeer (*Charadrius vociferus*)

Solitary Sandpiper (*Tringa solitaria*)

Wild Turkey (*Meleagris gallopavo*)

Common Bobwhite (*Colinus virginianus*)

Red-shouldered Hawk (*Buteo lineatus*)

Turkey Vulture (*Cathartes aura*)

Mourning Dove (*Zenaida macroura*)

Yellow-billed Cuckoo (*Coccyzus americanus*)

Ruby-throated Hummingbird (*Archilochus colubris*)

Belted Kingfisher (*Megaceryle alcyon*)

Pileated Woodpecker (*Dryocopus pileatus*)

Red-bellied Woodpecker (*Melanerpes carolinus*)

Downy Woodpecker (*Picoides pubescens*)

Hairy Woodpecker (*Picoides villosus*)

Eastern Kingbird (*Tyrannus tyrannus*)

Great Crested Flycatcher (*Myiarchus crinitus*)

Eastern Phoebe (*Sayornis phoebe*)

Acadian Flycatcher (*Empidonax vireescens*)

Chimney Swift (*Chaetura pelagica*)

American Crow (*Corvus brachyrhynchos*)

Blue Jay (*Cyanocitta cristata*)

Carolina Chickadee (*Parus carolinensis*)

Tufted Titmouse (*Parus bicolor*)

White-breasted Nuthatch (*Sitta carolinensis*)

Carolina Wren (*Thryothorus ludovicianus*)

Blue-gray Gnatcatcher (*Polioptila caerulea*)

Brown Thrasher (*Taxostoma rufum*)

Gray Catbird (*Dumetella carolinensis*)

Eastern Bluebird (*Sialia sialis*)

American Robin (*Turdus migratorius*)

Wood Thrush (*Hylocichla mustelina*)

**APPENDIX V.** Continued.

Cedar Waxwing (*Bombycilla cedrorum*)  
Red-eyed Vireo (*Vireo olivaceus*)  
Yellow-throated Vireo (*Vireo flavifrons*)  
White-eyed Vireo (*Vireo griseus*)  
Northern Parula (*Parula americana*)  
Black-throated Green Warbler (*Dendroica virens*)  
Black-and-white Warbler (*Mniotilta varia*)  
Yellow-rumped Warbler (*Dendroica coronata*)  
American Redstart (*Setophaga ruticilla*)  
Prairie Warbler (*Dendroica discolor*)  
Worm-eating Warbler (*Helmitheros vermivorus*)  
Hooded Warbler (*Wilsonia citrina*)  
Kentucky Warbler (*Oporornis formosus*)  
Common Yellowthroat (*Geothlypis trichas*)  
Yellow-breasted Chat (*Icteria virens*)  
Louisiana Waterthrush (*Seiurus motacilla*)  
Ovenbird (*Seiurus aurocapillus*)  
Brown-headed Cowbird (*Molothrus ater*)  
Common Grackle (*Quiscalus quiscula*)  
Eastern Meadowlark (*Sturnella magna*)  
Baltimore Oriole (*Icterus galbula*)  
Scarlet Tanager (*Piranga olivacea*)  
Northern Cardinal (*Cardinalis cardinalis*)  
American Goldfinch (*Carduelis tristis*)  
Indigo Bunting (*Passerina cyanea*)  
Chipping Sparrow (*Spizella passerina*)  
Field Sparrow (*Spizella pusilla*)  
Mammals  
Eastern Chipmunk (*Tamias striatus*)  
Eastern Gray Squirrel (*Sciurus carolinensis*)  
Woodchuck (*Marmota monax*)  
Raccoon (*Procyon lotor*; numerous scat observed)  
Muskrat (*Ondatra zibethicus*)  
White-tailed Deer (*Odocoileus virginianus*)

**APPENDIX V.** Continued.

**Jacob Fork East Corridor**

Amphibians

Fowler's Toad (*Bufo woodhousei*)

Reptiles

Northern Water Snake (*Nerodia sipedon*)

Black Rat Snake (*Elaphe obsoleta*)

Birds

Wood Duck (*Aix sponsa*)

Red-shouldered Hawk (*Buteo lineatus*)

Mourning Dove (*Zenaida macroura*)

Yellow-billed Cuckoo (*Coccyzus americanus*)

Ruby-throated Hummingbird (*Archilochus colubris*)

Pileated Woodpecker (*Dryocopus pileatus*)

Red-bellied Woodpecker (*Melanerpes carolinus*)

Downy Woodpecker (*Picoides pubescens*)

Acadian Flycatcher (*Empidonax virescens*)

American Crow (*Corvus brachyrhynchos*)

Blue Jay (*Cyanocitta cristata*)

Carolina Chickadee (*Parus carolinensis*)

Tufted Titmouse (*Parus bicolor*)

Carolina Wren (*Thryothorus ludovicianus*)

Blue-gray Gnatcatcher (*Polioptila caerulea*)

Cedar Waxwing (*Bombycilla cedrorum*)

Red-eyed Vireo (*Vireo olivaceus*)

White-eyed Vireo (*Vireo griseus*)

Worm-eating Warbler (*Helmitheros vermivorus*)

Ovenbird (*Seiurus aurocapillus*)

Common Grackle (*Quiscalus quiscula*)

Scarlet Tanager (*Piranga olivacea*)

Northern Cardinal (*Cardinalis cardinalis*)

American Goldfinch (*Carduelis tristis*)

Indigo Bunting (*Passerina cyanea*)

Rufous-sided Towhee (*Pipilo erythrophthalmus*)

Mammals

Eastern Chipmunk (*Tamias striatus*)

Eastern Gray Squirrel (*Sciurus carolinensis*)

Woodchuck (*Marmota monax*)

Raccoon (*Procyon lotor*; numerous scat observed)

Muskrat (*Ondatra zibethicus*)

White-tailed Deer (*Odocoileus virginianus*)

**APPENDIX V.** Continued.

**Catawba River Corridor**

Amphibians

Gray Tree Frog (*Hyla chrysoscelis*)  
Northern Cricket Frog (*Acris crepitans*)  
Green Frog (*Rana clamitans*)  
Bull Frog (*Rana catesbeiana*)

Reptiles

Eastern Box Turtle (*Terrapene carolina*)  
Snapping Turtle (*Chelydra serpentina*)  
River Cooter (*Chrysemys concinna*)  
Painted Turtle (*Chrysemys picta*)  
Eastern Fence Lizard (*Sceloporus undulatus*)  
Northern Water Snake (*Nerodia sipedon*)

Birds

Common Loon (*Gavia immer*)  
Canada Goose (*Branta canadensis*)  
Mallard (*Anas platyrhynchos*)  
Wood Duck (*Aix sponsa*)  
Great Blue Heron (*Ardea herodias*)  
Least Bittern (*Ixobrychus exilis*); recorded by David Campbell, 15 May 2001  
Killdeer (*Charadrius vociferus*)  
Common Bobwhite (*Colinus virginianus*)  
Red-tailed Hawk (*Buteo jamaicensis*)  
Red-shouldered Hawk (*Buteo lineatus*)  
Bald Eagle (*Haliaeetus leucocephalus*; 2 adults)  
Osprey (*Pandion haliaetus*)  
Turkey Vulture (*Cathartes aura*)  
Mourning Dove (*Zenaida macroura*)  
Yellow-billed Cuckoo (*Coccyzus americanus*)  
Ruby-throated Hummingbird (*Archilochus colubris*)  
Belted Kingfisher (*Megaceryle alcyon*)  
Pileated Woodpecker (*Dryocopus pileatus*)  
Northern Flicker (*Colaptes auratus*)  
Red-bellied Woodpecker (*Melanerpes carolinus*)  
Downy Woodpecker (*Picoides pubescens*)  
Hairy Woodpecker (*Picoides villosus*)  
Eastern Kingbird (*Tyrannus tyrannus*)  
Great Crested Flycatcher (*Myiarchus crinitus*)  
Acadian Flycatcher (*Empidonax virescens*)  
Eastern Phoebe (*Sayornis phoebe*)  
Cliff Swallow (*Petrochelidon pyrrhonota*); Colony under bridge of NC 16

**APPENDIX V.** Continued.

Rough-winged Swallow (*Stelgidopteryx ruficollis*)  
Chimney Swift (*Chaetura pelagica*)  
American Crow (*Corvus brachyrhynchos*)  
Blue Jay (*Cyanocitta cristata*)  
Carolina Chickadee (*Parus carolinensis*)  
Tufted Titmouse (*Parus bicolor*)  
Brown-headed Nuthatch (*Sitta pusilla*)  
Carolina Wren (*Thryothorus ludovicianus*)  
Blue-gray Gnatcatcher (*Polioptila caerulea*)  
Brown Thrasher (*Toxostoma rufum*)  
Northern Mockingbird (*Mimus polyglottos*)  
Eastern Bluebird (*Sialia sialis*)  
American Robin (*Turdus migratorius*)  
Wood Thrush (*Hylocichla mustelina*)  
Red-eyed Vireo (*Vireo olivaceus*)  
Northern Parula (*Parula americana*)  
Yellow-throated Warbler (*Dendroica dominica*)  
Prothonotary Warbler (*Protonotaria citrea*; observed on island)  
Prairie Warbler (*Dendroica discolor*)  
Yellow Warbler (*Dendroica petechia*)  
Common Yellowthroat (*Geothlypis trichas*)  
Yellow-breasted Chat (*Icteria virens*)  
Red-winged Blackbird (*Agelaius phoeniceus*)  
Brown-headed Cowbird (*Molothrus ater*)  
Common Grackle (*Quiscalus quiscula*)  
Eastern Meadowlark (*Sturnella magna*)  
Orchard Oriole (*Icterus spurius*)  
Baltimore Oriole (*Icterus galbula*)  
Scarlet Tanager (*Piranga olivacea*)  
Summer Tanager (*Piranga rubra*)  
Northern Cardinal (*Cardinalis cardinalis*)  
American Goldfinch (*Carduelis tristis*)  
Blue Grosbeak (*Guiraca caerulea*)  
Indigo Bunting (*Passerina cyanea*)  
Rufous-sided Towhee (*Pipilo erythrophthalmus*)  
Chipping Sparrow (*Spizella passerina*)  
Mammals  
Eastern Woodrat (*Neotoma floridana*)  
Eastern Gray Squirrel (*Sciurus carolinensis*)  
Raccoon (*Procyon lotor*)  
Eastern Cottontail (*Sylvilagus floridanus*)

## APPENDIX V. Continued.

Muskrat (*Ondatra zibethica*)  
Woodchuck (*Marmota monax*)  
Beaver (*Castor canadensis*)  
White-tailed Deer (*Odocoileus virginianus*)

### Lyle Creek Corridor

#### Amphibians

Green Frog (*Rana clamitans*)

#### Reptiles

Eastern Box Turtle (*Terrapene carolina*)

#### Birds

Great Blue Heron (*Ardea herodias*)  
Green-backed Heron (*Butorides striatus*)  
Red-shouldered Hawk (*Buteo lineatus*)  
Black Vulture (*Coragyps atratus*)  
Mourning Dove (*Zenaida macroura*)  
Yellow-billed Cuckoo (*Coccyzus americanus*)  
Ruby-throated Hummingbird (*Archilochus colubris*)  
Belted Kingfisher (*Megaceryle alcyon*)  
Pileated Woodpecker (*Dryocopus pileatus*)  
Northern Flicker (*Colaptes auratus*)  
Red-bellied Woodpecker (*Melanerpes carolinus*)  
Downy Woodpecker (*Picoides pubescens*)  
Hairy Woodpecker (*Picoides villosus*)  
Eastern Phoebe (*Sayornis phoebe*)  
Eastern Pewee (*Contopus virens*)  
Acadian Flycatcher (*Empidonax vireescens*)  
Barn Swallow (*Hirundo rustica*)  
American Crow (*Corvus brachyrhynchos*)  
Blue Jay (*Cyanocitta cristata*)  
Carolina Chickadee (*Parus carolinensis*)  
Tufted Titmouse (*Parus bicolor*)  
White-breasted Nuthatch (*Sitta carolinensis*)  
Carolina Wren (*Thryothorus ludovicianus*)  
Blue-gray Gnatcatcher (*Poliophtila caerulea*)  
Wood Thrush (*Hylocichla mustelina*)  
Cedar Waxwing (*Bombycilla cedrorum*)  
Red-eyed Vireo (*Vireo olivaceus*)  
Yellow-throated Vireo (*Vireo flavifrons*)  
White-eyed Vireo (*Vireo griseus*)  
Northern Parula (*Parula americana*)

**APPENDIX V.** Continued.

Pine Warbler (*Dendroica pinus*)  
Worm-eating Warbler (*Helmitheros vermivorus*)  
Common Yellowthroat (*Geothlypis trichas*)  
Yellow-breasted Chat (*Icteria virens*)  
Louisiana Waterthrush (*Seiurus motacilla*)  
Brown-headed Cowbird (*Molothrus ater*)  
Scarlet Tanager (*Piranga olivacea*)  
Northern Cardinal (*Cardinalis cardinalis*)  
American Goldfinch (*Carduelis tristis*)  
Blue Grosbeak (*Guiraca caerulea*)  
Indigo Bunting (*Passerina cyanea*)  
Rufous-sided Towhee (*Pipilo erythrophthalmus*)  
Field Sparrow (*Spizella pusilla*)

Mammals

Eastern Chipmunk (*Tamias striatus*)  
Eastern Gray Squirrel (*Sciurus carolinensis*)  
Woodchuck (*Marmota monax*)  
Raccoon (*Procyon lotor*)  
Red Fox (*Vulpes vulpes*)  
White-tailed Deer (*Odocoileus virginianus*)

**Lyle Creek Wetland**

Amphibians

Gray Tree Frog (*Hyla chrysoscelis*)

Birds

Great Blue Heron (*Ardea herodias*); fly by.  
Green-backed Heron (*Butorides striatus*); fly by.  
Red-shouldered Hawk (*Buteo lineatus*); fly by.  
Mourning Dove (*Zenaida macroura*)  
Eastern Kingbird (*Tyrannus tyrannus*)  
Common Yellowthroat (*Geothlypis trichas*)  
Common Grackle (*Quiscalus quiscula*)  
Red-winged Blackbird (*Agelaius phoeniceus*)  
Indigo Bunting (*Passerina cyanea*)

**Murray's Mill Lake and Upper Balls Creek**

Freshwater Mussels

*Elliptio complanata*  
*Pyganodon cataracta*

**APPENDIX V.** Continued.

Amphibians

Bull Frog (*Rana catesbeiana*)  
Green Frog (*Rana clamitans*)  
Northern Cricket Frog (*Acris crepitans*)  
American Toad (*Bufo americanus*)  
Fowler's Toad (*Bufo woodhousei*)

Reptiles

Snapping Turtle (*Chelydra serpentina*)  
Painted Turtle (*Chrysemys picta*)  
Florida Cooter (*Chrysemys floridana*)  
Eastern Box Turtle (*Terrapene carolina*)  
Northern Water Snake (*Nerodia sipedon*)  
Black Rat Snake (*Elaphe obsoleta*)  
Black Racer (*Coluber constrictor*)

Birds

Canada Goose (*Branta canadensis*)  
Wood Duck (*Aix sponsa*)  
Mallard (*Anas platyrhynchos*)  
Green-backed Heron (*Butorides striatus*)  
Great Blue Heron (*Ardea herodias*)  
Wild Turkey (*Meleagris gallopavo*)  
Common Bobwhite (*Colinus virginianus*)  
Broad-winged Hawk (*Buteo platypterus*)  
Red-shouldered Hawk (*Buteo lineatus*)  
Red-tailed Hawk (*Buteo jamaicensis*)  
Mourning Dove (*Zenaida macroura*)  
Yellow-billed Cuckoo (*Coccyzus americanus*)  
Belted Kingfisher (*Megaceryle alcyon*)  
Pileated Woodpecker (*Dryocopus pileatus*)  
Red-bellied Woodpecker (*Melanerpes carolinus*)  
Downy Woodpecker (*Picoides pubescens*)  
Eastern Kingbird (*Tyrannus tyrannus*)  
Great Crested Flycatcher (*Myiarchus crinitus*)  
Eastern Phoebe (*Sayornis phoebe*)  
Eastern Pewee (*Contopus virens*)  
Acadian Flycatcher (*Empidonax virescens*)  
Barn Swallow (*Hirundo rustica*)  
Rough-winged Swallow (*Stelgidopteryx ruficollis*)  
Chimney Swift (*Chaetura pelagica*)  
American Crow (*Corvus brachyrhynchos*)  
Blue Jay (*Cyanocitta cristata*)

**APPENDIX V.** Continued.

Carolina Chickadee (*Parus carolinensis*)  
Tufted Titmouse (*Parus bicolor*)  
White-breasted Nuthatch (*Sitta carolinensis*)  
Brown-headed Nuthatch (*Sitta pusilla*)  
Carolina Wren (*Thryothorus ludovicianus*)  
Blue-gray Gnatcatcher (*Poliophtila caerulea*)  
Brown Thrasher (*Taxostoma rufum*)  
Northern Mockingbird (*Mimus polyglottos*)  
Eastern Bluebird (*Sialia sialis*)  
American Robin (*Turdus migratorius*)  
Wood Thrush (*Hylocichla mustelina*)  
Cedar Waxwing (*Bombycilla cedrorum*)  
Red-eyed Vireo (*Vireo olivaceus*)  
Yellow-throated Vireo (*Vireo flavifrons*)  
Blue-headed Vireo (*Vireo solitarius*)  
Common Yellowthroat (*Geothlypis trichas*)  
Yellow-breasted Chat (*Icteria virens*)  
Red-winged Blackbird (*Agelaius phoeniceus*)  
Brown-headed Cowbird (*Molothrus ater*)  
Common Grackle (*Quiscalus quiscula*)  
Eastern Meadowlark (*Sturnella magna*)  
Orchard Oriole (*Icterus spurius*)  
Summer Tanager (*Piranga rubra*)  
Scarlet Tanager (*Piranga olivacea*)  
Northern Cardinal (*Cardinalis cardinalis*)  
Rose-breasted Grosbeak (*Pheucticus ludovicianus*)  
House Finch (*Carpodacus mexicanus*)  
Blue Grosbeak (*Guiraca caerulea*)  
American Goldfinch (*Carduelis tristis*)  
Indigo Bunting (*Passerina cyanea*)  
Rufous-sided Towhee (*Pipilo erythrophthalmus*)  
Chipping Sparrow (*Spizella passerina*)  
Field Sparrow (*Spizella pusilla*)  
Mammals  
Eastern Chipmunk (*Tamias striatus*)  
Eastern Gray Squirrel (*Sciurus carolinensis*)  
Eastern Cottontail (*Sylvilagus floridanus*)  
Woodchuck (*Marmota monax*)  
Raccoon (*Procyon lotor*)  
Muskrat (*Ondatra zibethicus*)  
White-tailed Deer (*Odocoileus virginianus*)

**APPENDIX V.** Continued.

**Terrapin Creek Corridor**

Amphibians

Gray Tree Frog (*Hyla chrysoscelis*)

Green Frog (*Rana clamitans*)

Reptiles

Snapping Turtle (*Chelydra serpentina*)

Eastern Box Turtle (*Terrapene carolina*)

Birds

Wild Turkey (*Meleagris gallopavo*)

Mourning Dove (*Zenaida macroura*)

Yellow-billed Cuckoo (*Coccyzus americanus*)

Ruby-throated Hummingbird (*Archilochus colubris*)

Pileated Woodpecker (*Dryocopus pileatus*)

Downy Woodpecker (*Picoides pubescens*)

Eastern Pewee (*Contopus virens*)

Acadian Flycatcher (*Empidonax virescens*)

Blue Jay (*Cyanocitta cristata*)

Carolina Chickadee (*Parus carolinensis*)

Tufted Titmouse (*Parus bicolor*)

Carolina Wren (*Thryothorus ludovicianus*)

Blue-gray Gnatcatcher (*Poliophtila caerulea*)

Brown Thrasher (*Taxostoma rufum*)

American Robin (*Turdus migratorius*)

Wood Thrush (*Hylocichla mustelina*)

Red-eyed Vireo (*Vireo olivaceus*)

Blue-headed Vireo (*Vireo solitarius*)

Northern Parula (*Parula americana*)

Pine Warbler (*Dendroica pinus*)

Hooded Warbler (*Wilsonia citrina*)

Louisiana Waterthrush (*Seiurus motacilla*)

Ovenbird (*Seiurus aurocapillus*)

Summer Tanager (*Piranga rubra*)

Scarlet Tanager (*Piranga olivacea*)

Northern Cardinal (*Cardinalis cardinalis*)

American Goldfinch (*Carduelis tristis*)

Indigo Bunting (*Passerina cyanea*)

Mammals

Raccoon (*Procyon lotor*)

White-tailed Deer (*Odocoileus virginianus*)

**APPENDIX V.** Continued.

**Lake Norman Slopes and Shoreline**

Amphibians

Bull Frog (*Rana catesbeiana*)

Birds

Canada Goose (*Branta canadensis*)

Mallard (*Anas platyrhynchos*)

Great Blue Heron (*Ardea herodias*)

Osprey (*Pandion haliaetus*)

Turkey Vulture (*Cathartes aura*)

Black Vulture (*Coragyps atratus*)

Mourning Dove (*Zenaida macroura*)

Yellow-billed Cuckoo (*Coccyzus americanus*)

Pileated Woodpecker (*Dryocopus pileatus*)

Fish Crow (*Corvus ossifragus*)

American Crow (*Corvus brachyrhynchos*)

Blue Jay (*Cyanocitta cristata*)

Carolina Chickadee (*Parus carolinensis*)

Tufted Titmouse (*Parus bicolor*)

Carolina Wren (*Thryothorus ludovicianus*)

Blue-gray Gnatcatcher (*Polioptila caerulea*)

Red-eyed Vireo (*Vireo olivaceus*)

Pine Warbler (*Dendroica pinus*)

Common Grackle (*Quiscalus quiscula*)

Northern Cardinal (*Cardinalis cardinalis*)

American Goldfinch (*Carduelis tristis*)

Mammals

Eastern Gray Squirrel (*Sciurus carolinensis*)

**APPENDIX VI.** List of birds observed during the Catawba County Inventory.

Common Loon (*Gavia immer*)  
Canada Goose (*Branta canadensis*)  
Mallard (*Anas platyrhynchos*)  
Wood Duck (*Aix sponsa*)  
Great Blue Heron (*Ardea herodias*)  
Green-backed Heron (*Butorides striatus*)  
Least Bittern (*Ixobrychus exilis*)  
Killdeer (*Charadrius vociferus*)  
Solitary Sandpiper (*Tringa solitaria*)  
Wild Turkey (*Meleagris gallopavo*)  
Ruffed Grouse (*Bonasa umbellus*)  
Common Bobwhite (*Colinus virginianus*)  
Sharp-shinned Hawk (*Accipiter striatus*)  
Red-tailed Hawk (*Buteo jamaicensis*)  
Red-shouldered Hawk (*Buteo lineatus*)  
Broad-winged Hawk (*Buteo platypterus*)  
Bald Eagle (*Haliaeetus leucocephalus*)  
Osprey (*Pandion haliaetus*)  
Turkey Vulture (*Cathartes aura*)  
Black Vulture (*Coragyps atratus*)  
Barred Owl (*Strix varia*)  
Mourning Dove (*Zenaida macroura*)  
Rock Dove (*Columba livia*)  
Yellow-billed Cuckoo (*Coccyzus americanus*)  
Ruby-throated Hummingbird (*Archilochus colubris*)  
Belted Kingfisher (*Megaceryle alcyon*)  
Pileated Woodpecker (*Dryocopus pileatus*)  
Northern Flicker (*Colaptes auratus*)  
Red-bellied Woodpecker (*Melanerpes carolinus*)  
Downy Woodpecker (*Picoides pubescens*)  
Hairy Woodpecker (*Picoides villosus*)  
Eastern Kingbird (*Tyrannus tyrannus*)  
Great Crested Flycatcher (*Myiarchus crinitus*)  
Eastern Phoebe (*Sayornis phoebe*)  
Eastern Pewee (*Contopus virens*)  
Acadian Flycatcher (*Empidonax virescens*)  
Cliff Swallow (*Petrochelidon pyrrhonota*)  
Barn Swallow (*Hirundo rustica*)  
Tree Swallow (*Iridoprocne bicolor*)  
Rough-winged Swallow (*Stelgidopteryx ruficollis*)  
Chimney Swift (*Chaetura pelagica*)

**APPENDIX VI.** Continued.

Fish Crow (*Corvus ossifragus*)  
American Crow (*Corvus brachyrhynchos*)  
Blue Jay (*Cyanocitta cristata*)  
Carolina Chickadee (*Parus carolinensis*)  
Tufted Titmouse (*Parus bicolor*)  
White-breasted Nuthatch (*Sitta carolinensis*)  
Brown-headed Nuthatch (*Sitta pusilla*)  
Carolina Wren (*Thryothorus ludovicianus*)  
Blue-gray Gnatcatcher (*Polioptila caerulea*)  
Brown Thrasher (*Taxostoma rufum*)  
Gray Catbird (*Dumetella carolinensis*)  
Northern Mockingbird (*Mimus polyglottos*)  
Eastern Bluebird (*Sialia sialis*)  
American Robin (*Turdus migratorius*)  
Hermit Thrush (*Catharus guttatus*)  
Wood Thrush (*Hylocichla mustelina*)  
Cedar Waxwing (*Bombycilla cedrorum*)  
Red-eyed Vireo (*Vireo olivaceus*)  
Yellow-throated Vireo (*Vireo flavifrons*)  
White-eyed Vireo (*Vireo griseus*)  
Blue-headed Vireo (*Vireo solitarius*)  
Northern Parula (*Parula americana*)  
Yellow-throated Warbler (*Dendroica dominica*)  
Black-throated Green Warbler (*Dendroica virens*)  
Prothonotary Warbler (*Protonotaria citrea*)  
Black-and-white Warbler (*Mniotilta varia*)  
Black-throated Blue Warbler (*Dendroica caerulescens*)  
Yellow-rumped Warbler (*Dendroica coronata*)  
American Redstart (*Setophaga ruticilla*)  
Pine Warbler (*Dendroica pinus*)  
Prairie Warbler (*Dendroica discolor*)  
Yellow Warbler (*Dendroica petechia*)  
Worm-eating Warbler (*Helmitheros vermivorus*)  
Hooded Warbler (*Wilsonia citrina*)  
Kentucky Warbler (*Oporornis formosus*)  
Common Yellowthroat (*Geothlypis trichas*)  
Yellow-breasted Chat (*Icteria virens*)  
Louisiana Waterthrush (*Seiurus motacilla*)  
Ovenbird (*Seiurus aurocapillus*)  
Red-winged Blackbird (*Agelaius phoeniceus*)  
Brown-headed Cowbird (*Molothrus ater*)

**APPENDIX VI.** Continued.

Common Grackle (*Quiscalus quiscula*)  
Eastern Meadowlark (*Sturnella magna*)  
Orchard Oriole (*Icterus spurius*)  
Baltimore Oriole (*Icterus galbula*)  
Summer Tanager (*Piranga rubra*)  
Scarlet Tanager (*Piranga olivacea*)  
Northern Cardinal (*Cardinalis cardinalis*)  
House Finch (*Carpodacus mexicanus*)  
American Goldfinch (*Carduelis tristis*)  
Blue Grosbeak (*Guiraca caerulea*)  
Indigo Bunting (*Passerina cyanea*)  
Rose-breasted Grosbeak (*Pheucticus ludovicianus*)  
Rufous-sided Towhee (*Pipilo erythrophthalmus*)  
Chipping Sparrow (*Spizella passerina*)  
Field Sparrow (*Spizella pusilla*)  
Grasshopper Sparrow (*Ammodramus savannarum*)