

## ENVIRONMENTAL INVENTORY

Soil and Environmental Consultants ( S&EC ) has completed detailed wetland delineation and site inventory. A Historical Records and Natural Heritage Program file search was also completed. No federally protected plant or animal species were found within the project boundaries.

“The Inventory of Natural Features and Wildlife Habitat for Chatham County” identifies the Duke Forest / Haw River Levees and Slopes as having County significance. The inventory suggests that additional property outside of the Duke Forest land be placed in conservation. The inventory is not intended to impose any requirements on private land owners. Nevertheless, the Applicant strives to meet this suggestion by providing additional stream and river buffer width and building setback along the Haw River corridor. In fact, Applicant has voluntarily proposed a 200 foot natural buffer measured from the Haw River bank and, as an additional protection, the Applicant proposes to voluntarily impose an additional 200’ building setback limiting development of vertical structures and ponds or pools to a minimum distance of 400’ from the river bank within the proposed project.

(Soil & Environmental, P.A. Report follows.)



# Soil & Environmental Consultants, PA

11010 Raven Ridge Road • Raleigh, North Carolina 27614 • Phone: (919) 846-5900 • Fax: (919) 846-9467  
www.SandEC.com

October 14, 2004  
S&EC Project No.: 6748.W4

Bradshaw & Robinson, L.L.P.  
Attn: Nicholas Robinson  
Hall-London House  
128 Hillsborough Street  
P.O. Box 607  
Pittsboro, North Carolina 27312

Re: Environmental Status Report for Williams Pond Project  
Chatham County, North Carolina

Dear Mr. Robinson:

The purpose of this report is to advise you on the status of environmental evaluations for the Williams Pond Project. The site is located on Bynum Ridge Road approximately 1000 feet east of its intersection with Bynum Road. The site is approximately 625 acres in size. Figure 1 shows the location of the site on a USGS topographic quadrangle.

Currently, the following environmental evaluations have been performed: 1) Preliminary wetland delineation, 2) Detailed wetland delineation, 3) Natural Heritage Program and State Historic Preservation file searches, 4) field survey of plant community types and the potential for protected terrestrial plant and animal species. The above listed evaluations are discussed briefly below.

## **Preliminary and Detailed Wetland Delineations**

S&EC completed a preliminary wetland delineation in April of 2004, followed by a detailed wetland delineation the following month. Six features depicted on either the USGS topographic map or Chatham County soil survey were believed to be subject to the Chatham County riparian buffers by S&EC. The site is located within a Water Supply Watershed, and thus Pokeberry Creek and the stream exiting Williams Pond would require a state required 100-foot buffer if impervious surface area exceeds 24%. In addition, perennial and intermittent waters within 2,500 feet of rivers (in this case, the Haw River) shall have a minimum of 100-foot vegetative buffer. The majority of wetlands onsite occur within the floodplain area of Pokeberry Creek. On June 24, 2004, Mr. Todd Tugwell of the USACE made "importance" calls on streams with proposed impacts by the current site plan. The NC-Division of Water Quality has made "perennial" calls on some of the streams and will evaluate the remaining streams next week.

---

### Charlotte Office:

236 LePhillip Court, Suite C  
Concord, NC 28025  
Phone: (704) 720-9405  
Fax: (704) 720-9406

### Greensboro Office:

3817-E Lawndale Drive  
Greensboro, NC 27455  
Phone: (336) 540-8234  
Fax: (336) 540-8235

Wetlands onsite consist of emergent wetlands, bottomland hardwood forest wetlands, and several linear wetlands. Please refer to the detailed wetland delineation report dated July 26, 2004 for further information. A wetland survey has been completed and is being submitted to the USACE for approval.

#### **Findings - NC State Historic Preservation Office**

The records' check at the State Historic Preservation Office (SHPO) on April 12, 2004 revealed that **there are no structures on the property that appear on the National Registry (NR), Determination of Eligibility (DOE), Study List (SL), or Locally Designated (LD) lists.** One property, designated as CH 279, the Snipes House, located approximately 0.1 mile north of Williams Pond, appeared on the SHPO map. This house was architecturally reviewed. Approximately 0.2 miles west of the property are three designated sites: 1) the Robert Joseph Moore House [CH 325(NR)], 2) Bynum Mill and Mill Village [CH 685 (DOE)], and 3) Bynum Bridge [CH 658 (DOE)].

#### **Findings – NC Natural Heritage Program Office**

The record check was performed on April 12, 2004. The following species are listed as threatened or endangered in Chatham County: Bald Eagle (*Haliaeetus leucocephalus*), Red-cockaded Woodpecker (*Picoides borealis*), Cape Fear Shiner (*Notropis mekistocholas*), and Harperella (*Ptilimnium nodosum*).

The file review yielded no federally listed plant or animal species found within the project boundaries. The closest protected elemental occurrence, the Cape Fear Shiner (*Notropis mekistocholas*), was documented approximately 0.4 miles southwest of the site, upstream within the Haw River. This species is currently federally protected as endangered. Additionally, two other rare invertebrate species, Septima's clubtail (*Gomphus septima*) and the yellow lampmussel (*Lampsilis cariosa*), were documented approximately 1000 feet southwest of the site upstream within the Haw River. These two species are listed by the state as Significantly Rare and Endangered respectively. The buttercup phacelia (NC-SR-T; US-FSC) has been documented adjacent to the property near the junction of Pokeberry Creek and the Haw River within the Duke Forest / Haw River Levees and Slopes. This adjacent property has state significant status (see attached map and description). The attached document recommends adding additional land adjacent to the river as a conservation easement to help preserve the Haw River Levee area. The strip of land previously referred to as Duke Forest is now owned by the state.

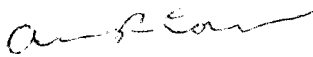
## Plant Community Types and Potential Habitat for Rare Terrestrial Species

In September of 2004, S&EC conducted a field survey for potential habitat for rare terrestrial plant and animal species, as well as, mapped the vegetation types found on the subject property. The vegetation survey yielded 8 distinctive types: Dry Mixed Hardwoods, Mixed Hardwoods, Pine-Hardwoods, Pine Stands, Pasture, Early Successional Cutovers, and a Bamboo Forest. Please see the vegetation map and the Threatened and Endangered Species Report dated September 8, 2004 for more detail concerning the vegetation of the Williams Property Project. After the survey of the property and examination of the plant communities, no listed species were found within the property boundaries. It was concluded that the required habitat for the terrestrial species that are federally listed as threatened or endangered in Chatham County, the Bald Eagle (*Haliaeetus leucocephalus*), Red-cockaded Woodpecker (*Picoides borealis*), and Harperella (*Ptilimnium nodosum*) does not exist on property.

It was determined based on site observations, the development of this tract will have no negative impact on populations of federally listed terrestrial endangered and/or threatened species listed in Chatham County. However, the buttercup phacelia (NC-SR-T; US-FSC) has been documented adjacent to the property near the junction of Pokeberry Creek and the Haw River. This plant species typically flowers in April to May and thus was not apparent during the time of the survey. A survey of the lower mesic slopes for this species during the spring will be conducted if deemed necessary.

If you have any questions or need additional services please call us.

Sincerely,



Aaron Cooper  
Botanist



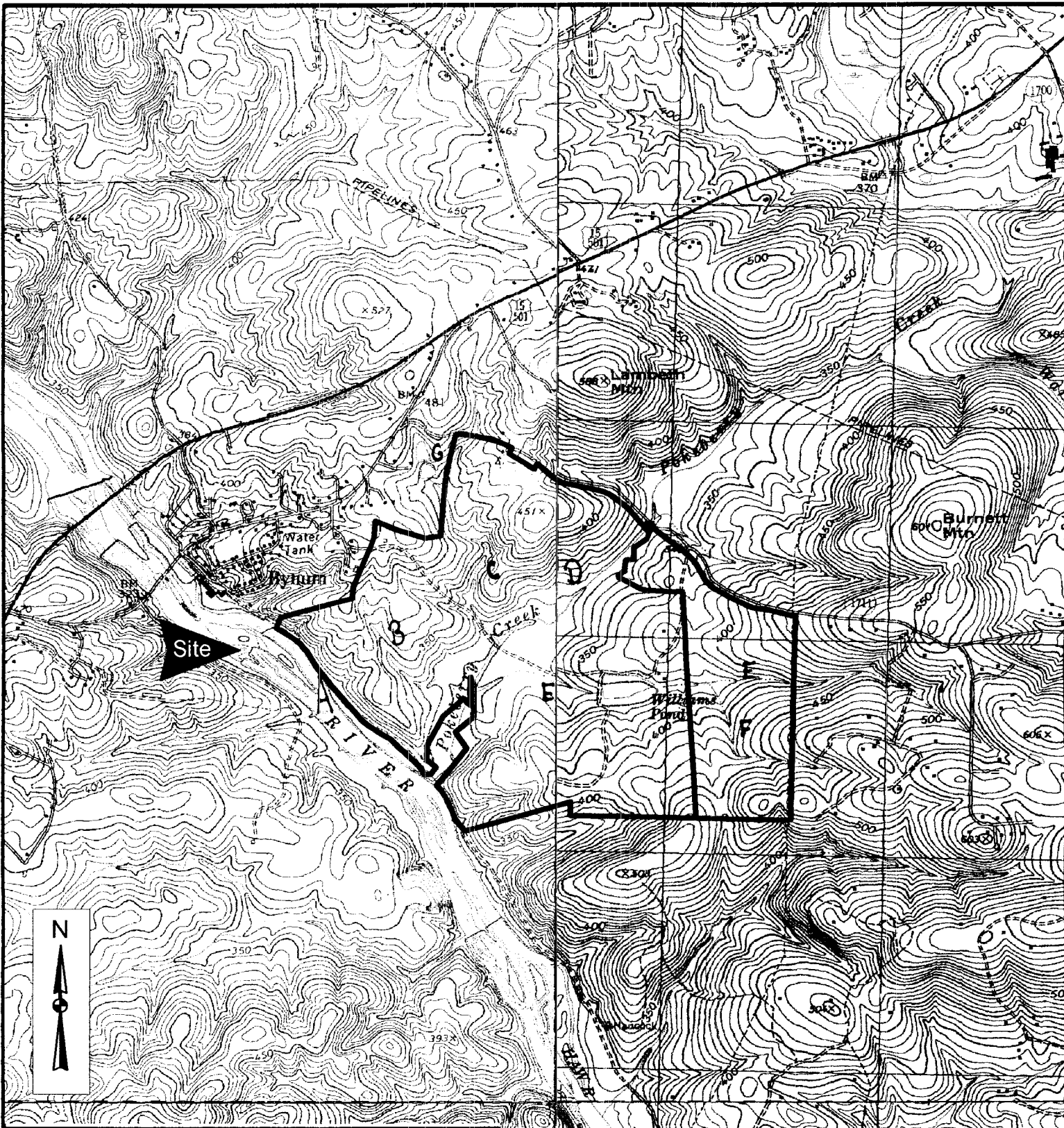
Sean Clark  
Environmental Scientist

Attachments:

USGS Vicinity Map

Duke Forest / Haw River Levees and Slopes

Historical Records Review / NHP File Search Letter



Project No.  
6748.W3

Project Mgr.:  
SC

Scale:  
1" = 2,000'

05/25/04

### Figure 1 - USGS Map

Williams Tract  
Polk-Sullivan, LLC  
Chatham Co., NC

Farrington & Bynum Quadrangles  
Dated 1993 & 1968



Soil & Environmental Consultants, PA  
11010 Raven Ridge Rd. • Raleigh, NC 27614  
(919) 846-5900 • (919) 846-9467  
Web Page: [www.SandEC.com](http://www.SandEC.com)



## Soil & Environmental Consultants, PA

11010 Raven Ridge Road • Raleigh, North Carolina 27614 • Phone: (919) 846-5900 • Fax: (919) 846-9467  
www.SandEC.com

April 23, 2004

S&EC Project No.: 6748.W4

Bynum Ridge, L.L.C.  
1000 Saint Albans Drive, Suite 400  
Raleigh, North Carolina 27609

Re: Historical Records Review / Natural Heritage Program File Search  
Williams Pond Project  
Chatham County, North Carolina

Dear Mr. Swain:

On April 12, 2004, S&EC conducted a review of records at the North Carolina State Historic Preservation Office (SHPO) for sites and structures of historical significance on the subject property. In addition, a file search for federally protected species was performed at the Natural Heritage Program office in Raleigh, North Carolina. The location of the project site is depicted on the attached USGS topographic quadrangles.

### Findings - NC State Historic Preservation Office

NC SHPO maintains records and locations of buildings, structures, and objects that are listed by local governments as historic landmarks or that are listed or eligible for listing on the National Register of Historic Places. The records' check at the State Historic Preservation Office (SHPO) revealed that **there are no structures on the property that appear on the National Registry (NR), Determination of Eligibility (DOE), Study List (SL), or Locally Designated (LD) lists.** One property, designated as CH 279, the Snipes House, located approximately 0.1 mile north of Williams Pond, appeared on the SHPO map. This house was architecturally reviewed. Approximately 0.2 miles west of the property are three designated sites: 1) the Robert Joseph Moore House [CH 325(NR)], 2) Bynum Mill and Mill Village [CH 685 (DOE)], and 3) Bynum Bridge [CH 658 (DOE)]. Please refer to the attached USGS quadrangles for the exact locations of these properties.

### Findings – NC Natural Heritage Program Office

NC NHP records occurrences of rare plant and animal species, exemplary natural communities, and special animal habitats known to occur in North Carolina. The record check was performed on April 12, 2004. The subject property is located on the Bynum and Farrington USGS

quadrangles. However, the Pittsboro and Merry Oaks quadrangles also were checked for possible nearby occurrences.

The Haw River borders the southwest portion of the property. This river is designated as an Identified Priority Area (IPA) by the Natural Heritage Program (NHP). Within the river are known locations of the federally-listed and state-listed Endangered Cape Fear shiner (*Notropis mekistocholas*), state-listed Endangered yellow lampmussel (*Lampsilis cariosa*), and a state-listed Significantly Rare septima's clubtail (*Gomphus septima*), a dragonfly. Parts of the river floodplain and the slopes above them are included in another IPA designated as Duke Forest/Haw River slopes and levee. Two natural communities were recognized within the latter IPA: 1) Mesic Mixed Hardwood Forest (Piedmont subtype), and 2) Piedmont/Mountain Levee Forest. Within the levee forest, an occurrence of the buttercup phacelia (*Phacelia covillei*) is recorded. This species is state-listed as SR-T (Significantly Rare-Threatened). A list of the occurrences within the four USGS quadrangles are listed below:

Bynum USGS

IPA	Orange (2)	Duke Forest/Haw River slopes and levee (outlined in purple)
IPA	Orange (3)	Haw River Aquatic Habitat (includes most of quad)
Natural Community	Green (2)	Mesic Mixed Hardwood Forest (Piedmont subtype)
Natural Community	Green (3)	Piedmont/Mountain Levee Forest
Natural Community	Green (4)	Floodplain Pool
Plants:	Blue (2)	<i>Phacelia covillei</i> (SR-T ; FSC)
Animals:	Red (4)	<i>Lampsilis cariosa</i> (Yellow Lampmussel) NC-E; US-FSC
	Red (1)	<i>Notropis mekistocholas</i> (Cape Fear Shiner) NC-E; US-E (2 dots on map; found 1992, 1993, and 2000)
	Red (3)	<i>Gomphus septima</i> (Septima's clubtail) NC-SR; US-FSC

Pittsboro USGS

IPA	Orange (2)	Duke Forest/Haw River slopes and levee (outlined in purple)
Natural Community	Green (5)	Mesic Mixed Hardwood Forest (Piedmont subtype)

Farrington USGS

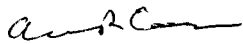
IPA	Orange (2)	Duke Forest/Haw River slopes and levee (outlined in purple)
IPA	Orange (3)	Haw River Aquatic Habitat
Natural Community	Green (2)	Mesic Mixed Hardwood Forest (Piedmont subtype)

Merry Oaks USGS

IPA	Orange (1)	Duke Forest/Haw River slopes and levee (continued from other quad; outlined in purple)
IPA	Orange (3)	Haw River Aquatic Habitat
Natural Community	Green (2)	Piedmont/Mountain Levee Forest
Natural Community	Green (3)	Floodplain Pool
Animals:	Red (6)	<i>Notropis mekistocholas</i> (Cape Fear Shiner) NC-E; US-E (found in 1992)
	Red (10)	<i>Gomphus septima</i> (Septima's clubtail) NC-SR; US-FSC

If you have any questions or need additional services, call me.

Sincerely,



Aaron Cooper  
Environmental Scientist

Attachments

- 1) USGS Quad Map with Historical Site Locations
- 2) USGS Quads with occurrences of rare plant and animal species, exemplary natural communities, and special animal habitats



**SITE NAME:** Duke Forest/Haw River Levees and Slopes

**SIGNIFICANCE:** State

**INTEGRITY:** High to good

**THREATS:** High -- clearcutting of adjoining tracts; ORV trails

**PROTECTION STATUS:** Receives partial protection as a tract of the Duke Forest

**JURISDICTION:** Center, New Hope, and Baldwin Townships

**OWNERSHIP:** Duke University

#### **SUMMARY OF SIGNIFICANT FEATURES:**

1. This is one of only two sites in the country where Septima's clubtail dragonfly (Gomphus septima) is known to occur; this species is a candidate for federal listing.
2. Along the levees occurs a large population of buttercup phacelia (Phacelia ranunculacea), a candidate for state listing.
3. A wide alluvial forest exists along one part of this tract; this area is noteworthy for the numerous oxbow pools and extensive patches of horsetail it contains.
4. The alluvial and riparian forests possess one of the richest avifaunas in the region; fifty species of breeding birds have been recorded, including 15 species of warblers. Other species indicative of the extensive nature and high quality of the forest include wild turkey (Meleagris gallopavo), pileated and hairy woodpeckers (Dryocopus pileatus and Picoides villosus).
5. In addition to its biological significance, this reach of the Haw River has high scenic values and is used intensively by local canoeists and kayakers.

#### **GENERAL SITE DESCRIPTION:**

This reach of the Haw cuts deeply through some of the most rugged terrain in the county as it drops down from the uplands of the Slate Belt into the flat and now flooded expanse of the Triassic Basin. Along the river's edge, steep bluffs and rock outcrops alternate with areas of bottomland ranging in size from small pockets to expanses several hundred yards wide. The river itself contains extensive areas of rapids and numerous rocky islands, creating challenging whitewater conditions that lure canoeists and kayakers from throughout the piedmont.

The majority of the terrestrial vegetation in this natural area occurs on the steep slopes above the river. The predominant community is mesic mixed hardwood forest dominated by beech (Fagus grandifolia) red oak (Quercus rubra), black gum (Nyssa sylvatica), pignut hickory (Carya glabra) and sourwood (Oxydendrum arboreum). The variety of habitats provided by differing steepness, aspect and soil depth affords an impressive diversity of plant species. Basswood (Tilia floridana), storax (Styrax grandifolia) and mountain laurel (Kalmia latifolia)

appear on the rock outcrops with such herbs as blunt-lobed woodsia (Woodsia obtusa), resurrection fern (Polypodium polypodioides), crested iris (Iris cristata), foamflower (Tiarella cordifolia) and crag-jangle (Heuchera villosa). On the gentler ravine slopes are thickets of buckeye (Aesculus sylvatica), masses of maidenhair fern (Adiantum pedatum), and a long list of woodland wildflowers including two species of toothwort (Cardamine angustata, C. concatenata), Solomon's seal (Polygonatum biflorum), wild geranium (Geranium maculatum) and black cohosh (Cimicifuga racemosa).

A fairly mature alluvial forest occupies the largest floodplain area along this stretch of the river. Such bottomland species as swamp chestnut oak (Quercus michauxii), hackberry (Celtis laevigata), green ash (Fraxinus pennsylvanica), box elder (Acer negundo), and American elm (Ulmus americana) form the canopy; the subcanopy and shrub layers include pawpaw (Asimina triloba), hop hornbeam (Ostrya virginiana), and bladdernut (Staphylea trifolia). Numerous depressions afford habitat for wetland species such as buttonbush (Cephalanthus occidentalis) and lizard's tail (Saururus cernuus). This bottomland is particularly noteworthy for two herbs. Buttercup phacelia, a diminutive spring ephemeral extremely restricted in its range, is present here in a population of thousands. Horsetail, rare in the county, here forms dense stands bordering the pools.

The maturity and diversity of these riparian and slope forests favors a corresponding richness of fauna. The avian community is especially diverse: 50 species of breeding birds have been recorded, including 15 species of warblers. Particularly noteworthy are the large numbers of redstarts (Setophaga ruticilla), prothonotary (Protonotaria citrea), northern parula (Parula americana), and yellow-throated warblers (Dendroica dominica), all characteristic of large riparian forests. Woodcock (Scolopax minor), wood duck (Aix sponsa), Kentucky warblers (Oporornis formosus), and hooded warblers (Wilsonia citrina) likewise are characteristic of mature bottomland forests, while the presence of wild turkey (Meleagris gallopavo), pileated woodpeckers (Dryocopus pileatus), hairy woodpeckers (Picoides villosus), and barred owls (Strix varia) is indicative of the large size of this forest and its connection to adjoining woodlands.

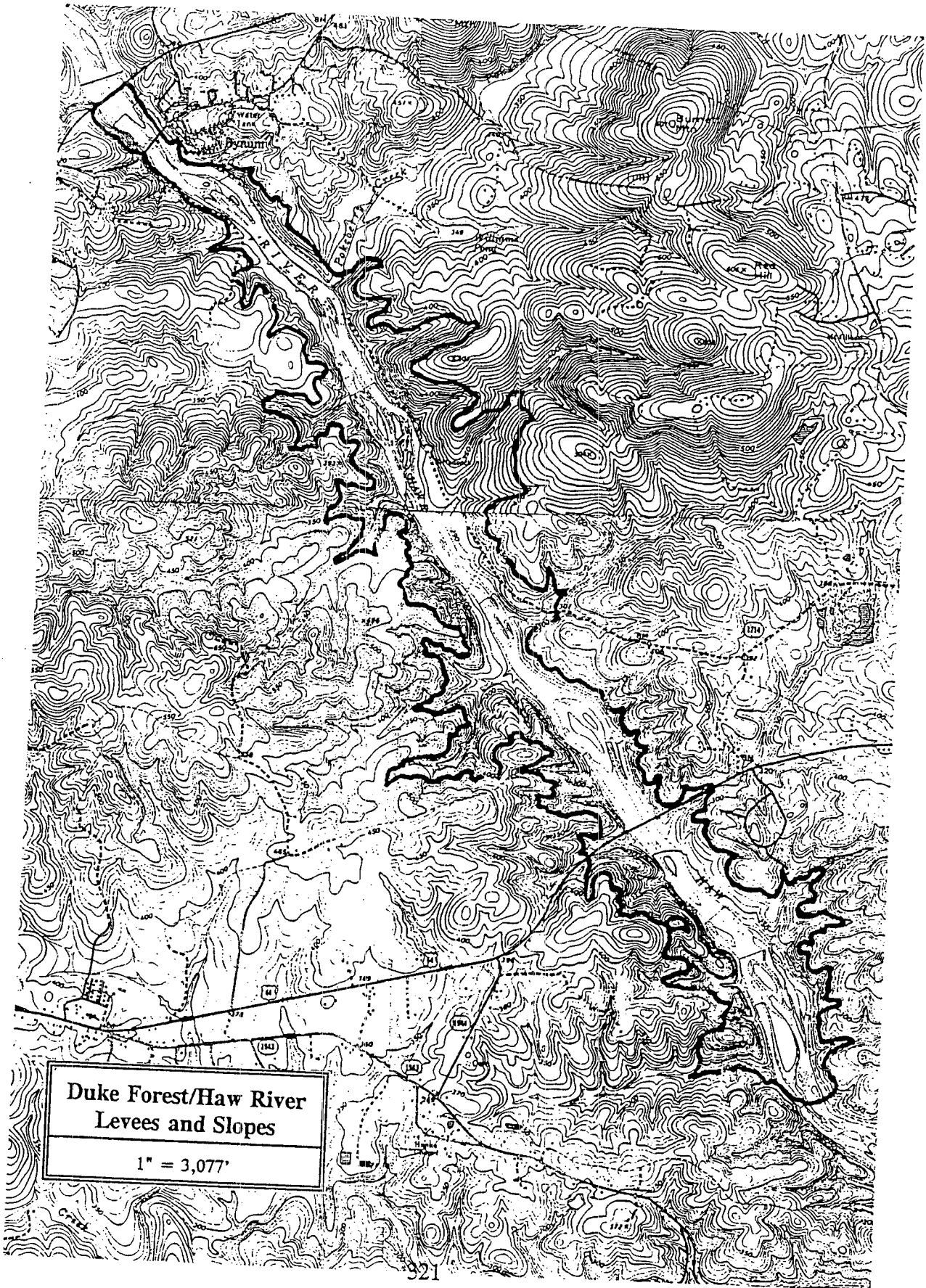
Apart from the bald eagles (Haliaeetus leucocephalus) that occasionally forage up the river from Jordan Lake, the rarest animals that occur on this site are two species of invertebrates. An old record exists for the brook floater mussel (Alasmidonta varicosa), now proposed for threatened status in North Carolina, but the rarest species of all -- plant or animal -- may be Septima's clubtail dragonfly (Gomphus septima). This species had previously been known in North Carolina only in the Rocky River near the 15-501 bridge; its only other confirmed population in the world was at an Alabama site now destroyed by a reservoir.

## CONSERVATION RECOMMENDATIONS:

Duke University should maintain this forest in its natural condition rather than manage it for timber. The Duke Forest tract is too narrow, however, to provide complete protection. A wider buffer strip is needed on the adjoining lands above the slopes; this might be most easily acquired by obtaining a conservation easement.

Other protection measures are required for the aquatic fauna, which have been severely impacted by water quality degradation. These measures will require basin-wide control of both point and non-point sources of pollution.





Duke Forest/Haw River  
Levees and Slopes  
1" = 3,077'