

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.

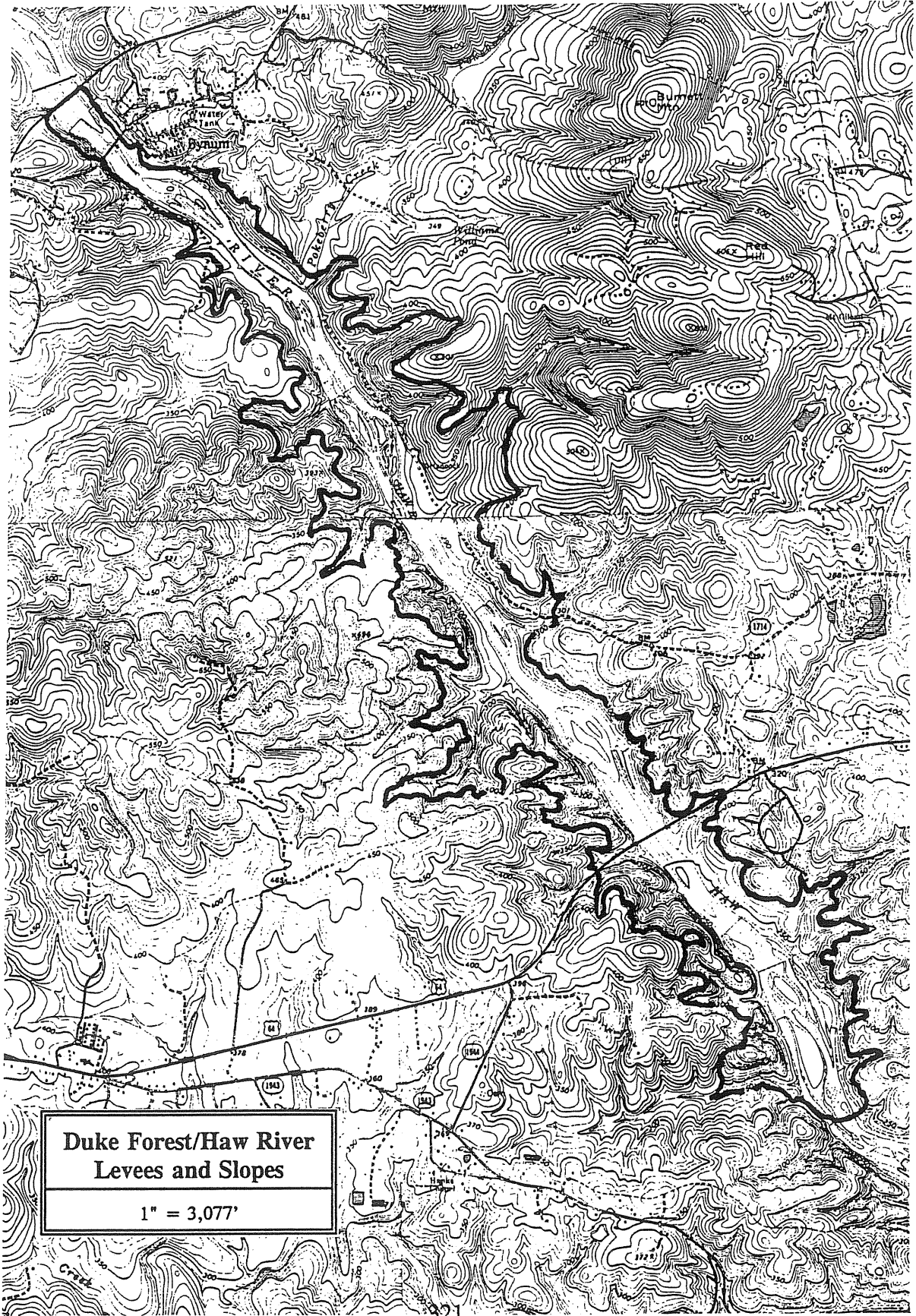
The maturity and diversity of these riparian and slope forests favors a corresponding richness of fauna. The avian community is especially diverse: 50 species of breeding birds have been recorded, including 15 species of warblers. Particularly noteworthy are the large numbers of redstarts (Setophaga 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'

SITE SURVEY REPORT

Site name: Duke Forest/Haw River Levees and Slopes

County: Chatham

Date(s): 4/IV/89, 7/V/89, 30/V/89, 31/V/89

Surveyors:

Stephen P. Hall, Ph.D
NC Natural Heritage Program
P.O. Box 27687
Raleigh, NC 27611-7687
(919) 733-7701

Marjorie Boyer
NC Plant Conservation Program
P.O. Box 27647
Raleigh, NC 27611
(919) 733-3610

Size: 1,672 acres

Quad: Merry Oaks (extends into Bynum)

Province: Piedmont

Watershed: Haw River --> Jordan Lake --> Haw River --> Cape Fear River

Location and directions: Slopes along both sides of Haw River from Bynum to Jordan Lake

Landowners and addresses:

Owners contacted and attitude:

General landscape description: See Site Description

Physical description

Aspect: Primarily east and west

Slope: 5-10 on most slopes; 10-35 in certain areas (flat along floodplain)

Topographic position: Crest to alluvial flat

Hydrology: Terrestrial

Moisture: Seasonally wet to moist

Elevation: 350 - 240'

Geology: Carolina Slate Series

Soils: Georgeville Stony Silt Loam (slopes); Congaree (bottomland)

Comments on physical description: A long, scenic, mostly uninhabited stretch of river; contains a number of islands, steep bluffs, and areas of rich bottomlands

Biological description

Site number: MROK1

Community # 1: Piedmont/Mountain Alluvial Forest

Vegetation structure: Forest

Position in landscape and relation to other communities: Stream floodplain bordering river

Quality and condition: Good

Size:

Dominants (*) and important species:

Canopy:

Acer negundo
Betula nigra
Celtis laevigata
Fraxinus pennsylvanica
Liquidambar styraciflua
Liriodendron tulipifera
Platanus occidentalis
Quercus michauxii
Quercus nigra
Quercus phellos
Ulmus alata
Ulmus americana

Shrubs and vines (cont):

Lonicera japonica
Parthenocissus quinquefolia
Rhus radicans
Rosa palustris
Rubus argutus
Smilax bona-nox
Smilax rotundifolia
Staphylea trifolia
Symphoricarpos orbiculatus
Viburnum acerifolium
Vitis sp.
Xanthorhiza simplicissima

Subcanopy:

Asimina triloba
Carpinus caroliniana
Cornus florida
Ilex opaca
Juniperus virginiana
Ostrya virginiana

Herbs:

Asarum canadense
Aster divaricatus
Boehmeria cylindrica
Botrychium virginianum
Cardamine angustata
Cardamine concatenata
rr Chaerophyllum procumbens
Claytonia virginica
Corydalis flavula
Equisetum hyemale
Erythronium umbilicatum
Galium aparine
Laportea canadensis
Ligusticum canadense
Myosotis macrosperma
Nemophila microcalyx

Shrubs and vines:

Aesculus sylvatica
Arundinaria gigantea
Cephalanthus occidentalis
Elaeagnus umbellata
Leucothoe racemosa
Ligustrum sinense
Lindera benzoin

Herbs (cont.):

Onoclea sensibilis
Osmorhiza longistylis
Oxalis violacea
c Phacelia ranunculacea
Pilea pumila
Polystichum acrostichoides
Prenanthes serpentaria
Ranunculus abortivus
Ranunculus recurvatus
Rudbeckia laciniata
Saururus cernuus
Stellaria media
Uvularia perfoliata
Verbescina occidentalis
Viola palmata v. triloba
Viola papilionacea
Zizia aurea

Biological description

Community # 2: Mesic Mixed-hardwood Forest

Vegetation structure: Forest and Rock Outcrop

Position in landscape and relation to other communities: Steep slopes bordering river and stream floodplain

Quality and condition: Good

Size:

Dominants (*) and important species:

Canopy:

Acer rubrum
Carya cordiformis
Carya glabra
Carya tomentosa
Fagus grandifolia
Liriodendron tulipifera
Nyssa sylvatica
Quercus alba
Quercus rubra

Subcanopy:

Acer floridanum
Carpinus caroliniana
Cornus florida
Diospyros virginiana
Fraxinus sp.
Morus rubra
Ostrya virginiana
Oxydendrum arboreum
Tilia floridana
Ulmus alata

Shrubs and vines:

Aesculus sylvatica
Anisostichus capreolata
Elaeagnus umbellata
Euonymus americanus
Gelsemium sempervirens
Hamamelis virginiana
Kalmia latifolia
Lonicera japonica
Parthenocissus quinquefolia
Rhus radicans
Smilax glauca
Styrax grandifolia
Vaccinium stamineum
Viburnum acerifolium
Viburnum dentatum
var. lucidum
Viburnum prunifolium
Xanthorrhiza simplicissima

Herbs:

rr	<i>Adiantum pedatum</i>	<i>Smilacena racemosa</i>
	<i>Antennaria solitaria</i>	<i>Solidago caesia</i>
	<i>Asplenium platyneuron</i>	<i>Stellaria pubera</i>
	<i>Cardamine angustata</i>	<i>Taenidia integerrima</i>
	<i>Cardamine concatenata</i>	<i>Thalictrum thalictroides</i>
	<i>Carex artitecta</i>	<i>Tiarella cordifolia</i>
	<i>Chimaphila maculata</i>	<i>Tipularia discolor</i>
	<i>Cimicifuga racemosa</i>	<i>Woodsia obtusa</i>
	<i>Cunila origanoides</i>	
	<i>Dioscorea villosa</i>	
	<i>Erythronium umbilicatum</i>	
	<i>Galium aparine</i>	
	<i>Galium circaezans</i>	
	<i>Geranium maculatum</i>	
	<i>Geum canadense</i>	
	<i>Goodyera pubescens</i>	
	<i>Hepatica americana</i>	
	<i>Heuchera americana</i>	
	<i>Hexastylis arifolia</i>	
	<i>Hieraceum venosum</i>	
	<i>Houstonia caerulea</i>	
	<i>Houstonia purpurea</i>	
	<i>Iris cristata</i>	
	<i>Ligusticum canadense</i>	
	<i>Luzula acuminata</i>	
	<i>Luzula echinata</i>	
	<i>Lycopodium flabelliforme</i>	
	<i>Melica mutica</i>	
	<i>Mitchella repens</i>	
	<i>Orobanche uniflora</i>	
	<i>Oxalis stricta</i>	
	<i>Oxalis violacea</i>	
	<i>Podophyllum peltatum</i>	
	<i>Polygonatum biflorum</i>	
	<i>Polypodium polypodioides</i>	
	<i>Polystichum acrostichoides</i>	
	<i>Prenanthes serpentaria</i>	
	<i>Salvia lyrata</i>	
	<i>Sanicula canadensis</i>	
	<i>Saxifraga virginiana</i>	
	<i>Sedum ternatum</i>	
	<i>Senecio smallii</i>	
	<i>Silene virginica</i>	

Special status species

State-listed species:

Plants:

c Phacelia ranunculacea

Animals:

fe Haliaeetus leucocephalus

fc Gomphus septima

Potential for other special status species: Low

Other noteworthy species or features:

Plants:

rr Adiantum pedatum

rr Chaerophyllum procumbens

Animals:

rr Meleagris gallopavo

Site condition

Site integrity: High to good

Average DBH of canopy trees: 30-35 cm

Maximum DBH of canopy trees:

Fire regime: Natural

Logged: Within last 30-40 years

Evenness of canopy: Natural

Ditched/drained: No

Stream channelized: No

Dredged/filled: No

Understory cleared: No

Grazed: No

ORV damaged: Yes; jeep trails enter area from adjoining private lands

Other disturbances: Yes; clearcuts on adjoining private lands

Adjacent Land Uses: Forest

Significance of site: State

Discussion: See Site Description

Protection considerations and management needs: This section of Duke Forest should be managed as a natural area, not for forestry; buffer-strips are needed to protect the integrity of this very narrow strip of prime riverine habitat.

Determination of survey boundaries: Encloses steep slopes and bottomlands along both sides of the Haw River from Bynum to Jordan Lake.

Priority for further study: Medium

Specimens collected:

Photographs:

Others knowledgeable about the site:

References:

Topo map: Attached

Sketch map: None

PLANT SPECIES LIST

List is: Medium Thorough

- | | | |
|----|---------------------------------|--------------------------------|
| | Equisetum hyemale (2) | Ulmus americana (56) |
| | Lycopodium flabelliforme (3) | Morus rubra (57) |
| | Botrychium virginianum (6) | Boehmeria cylindrica (59) |
| rr | Adiantum pedatum (10) | Laportea canadensis (59) |
| | Onoclea sensibilis (11) | Pilea pumila (59) |
| | Polystichum acrostichoides (11) | Asarum canadense (62) |
| | Woodsia obtusa (11) | Hexastylis arifolia (62) |
| | Asplenium platyneuron (13) | Claytonia virginica (70) |
| | Polypodium polypodioides (14) | Silene virginica (71) |
| | Juniperus virginiana (18) | Stellaria media (71) |
| | Arundinaria gigantea (29) | Stellaria pubera (71) |
| | Melica mutica (29) | Cimicifuga racemosa (76) |
| | Carex artitecta (30) | Hepatica americana (76) |
| | Luzula acuminata (40) | Ranunculus abortivus (76) |
| | Luzula echinata (40) | Ranunculus recurvatus (76) |
| | Erythronium umbilicatum (41) | Thalictrum thalictroides (76) |
| | Polygonatum biflorum (41) | Xanthorhiza simplicissima (76) |
| | Smilacena racemosa (41) | Podophyllum peltatum (77) |
| | Smilax bona-nox (41) | Liriodendron tulipifera (80) |
| | Smilax glauca (41) | Asimina triloba (81) |
| | Smilax rotundifolia (41) | Lindera benzoin (84) |
| | Uvularia perfoliata (41) | Corydalis flavula (86) |
| | Dioscorea villosa (43) | Cardamine angustata (88) |
| | Iris cristata (46) | Cardamine concatenata (88) |
| | Goodyera pubescens (49) | Sedum ternatum (91) |
| | Tipularia discolor (49) | Heuchera americana (94) |
| | Saururus cernuus (50) | Saxifraga virginiana (94) |
| | Carya cordiformis (53) | Tiarella cordifolia (94) |
| | Carya glabra (53) | Hamamelis virginiana (95) |
| | Carya tomentosa (53) | Liquidambar styraciflua (95) |
| | Betula nigra (54) | Platanus occidentalis (96) |
| | Carpinus caroliniana (54) | Geum canadense (97) |
| | Ostrya virginiana (54) | Rosa palustris (97) |
| | Fagus grandifolia (55) | Rubus argutus (97) |
| | Quercus alba (55) | Oxalis stricta (100) |
| | Quercus michauxii (55) | Oxalis violacea (100) |
| | Quercus nigra (55) | Geranium maculatum (101) |
| | Quercus phellos (55) | Rhus radicans (110) |
| | Quercus rubra (55) | Ilex opaca (112) |
| | Celtis laevigata (56) | Euonymus americanus (113) |
| | Ulmus alata (56) | Staphylea trifolia (114) |

- Acer floridanum* (115)
Acer negundo (115)
Acer rubrum (115)
Aesculus sylvatica (116)
Parthenocissus
 quinquefolia (120)
Vitis sp. (120)
Tilia floridana (121)
Viola palmata var. *triloba* (130)
Viola papilionacea (130)
Elaeagnus umbellata (134)
rr *Chaerophyllum*
 procumbens (140)
Ligusticum canadense (140)
Osmorhiza longistylis (140)
Sanicula canadensis (140)
Taenidia integerrima (140)
Zizia aurea (140)
Nyssa sylvatica (141)
Cornus florida (142)
Chimaphila maculata (145)
Kalmia latifolia (145)
Leucothoe racemosa (145)
Oxydendrum arboreum (145)
Vaccinium stamineum (145)
Diospyros virginiana (150)
Styrax grandifolia (152)
Fraxinus sp. (153)
Ligustrum sinense (153)
Gelsemium sempervirens (154)
Nemophila microcalyx (160)
c *Phacelia ranunculacea* (160)
Myosotis macrosperma (161)
Cunila origanoides (164)
Salvia lyrata (164)
Anisostichus capreolata (167)
Orobanche uniflora (169)
Cephalanthus occidentalis (173)
Galium aparine (173)
Galium circaezans (173)
Houstonia caerulea (173)
Houstonia purpurea (173)
Mitchella repens (173)
Lonicera japonica (174)
Symphoricarpos orbiculatus
 (174)
Viburnum acerifolium (174)
Viburnum dentatum
 var. *lucidum* (174)
Viburnum prunifolium (174)
Antennaria solitaria (179)
Aster divaricatus (179)
Hieraceum venosum (179)
Prenanthes serpentaria (179)
Rudbeckia laciniata (179)
Senecio smallii (179)
Solidago caesia (179)
Verbesina occidentalis (179)

ANIMAL SPECIES LIST

List is: Medium-thorough

Vertebrates:

i Butorides striatus
 i Aix sponsa
 fe Haliaeetus leucocephalus
 i Buteo jamaicensis
 rr Meleagris gallopavo
 i Scolopax minor
 Zenaida macroura
 i Coccyzus erythrophthalmus
 Bubo virginianus
 i Strix varia
 Archilochus colubris
 Megaceryle alcyon
 Melanerpes carolinus
 Picoides pubescens
 i Picoides villosus
 Colaptes auratus
 i Dryocopus pileatus
 Contopus virens
 Empidonax virescens
 Sayornis phoebe
 Myiarchus crinitus
 Hirundo rustica
 Cyanocitta cristata
 Corvus brachyrhynchos
 Parus carolinensis
 Parus bicolor
 Thryothurus ludovicianus
 Polioptila caerulea
 Hylocichla mustelina
 Vireo griseus
 Vireo flavifrons
 Vireo olivaceus
 Parula americana
 Dendroica dominica
 Dendroica pinus
 i Setophaga ruticilla
 i Protonotaria citrea
 i Seiurus aurocapillus

Vertebrates (cont.):

i Seiurus motacilla
 i Oporornis formosus
 Geothlypis trichas
 i Wilsonia citrina
 Icteria virens
 Piranga rubra
 Piranga olivacea
 Cardinalis cardinalis
 Passerina cyanea
 Pipilo erythrophthalmus
 Quiscalus quiscula
 Molothrus ater
 Carduelis tristis
 Scalopus aquaticus
 Sylvilagus floridanus
 Tamias striatus
 Sciurus carolinensis
 Castor canadensis
 Vulpes vulpes
 Procyon lotor
 Odocoileus virginianus
 Chrysemys sp.
 Nerodia sipedon
 Pseudacris triseriata
 Dorosoma cepedianum
 Cyprinus carpio

Invertebrates:

Papilio glaucus
Anthocharis midea
Celastrina ladon
Polygonia comma
Erynnis juvenalis
fc Gomphus septima
Basiaeschna janata
t Alasmidonta varicosa *

* NCHP database

SITE NAME: Rock Rest Mafic Islands and Shore

SIGNIFICANCE: County

INTEGRITY: Fair

THREATS: Medium -- timbering

PROTECTION STATUS: None

JURISDICTION: Hadley and Baldwin Townships

OWNERSHIP: Private

SUMMARY OF SIGNIFICANT FEATURES:

1. The islands and steep slopes along this reach of the Haw make it one of the most scenic areas in the county. This particular reach also receives heavy use by canoeists and kayakers.
2. The extensive mafic rock formations support a basophilic plant community, one of the less common types occurring within the county.
3. The presence of wild turkey indicates that this site serves as an important wildlife reservoir. It also is part of the system of wildlife corridors along the rivers that link together otherwise isolated refuge areas.

GENERAL SITE DESCRIPTION:

A mile and a half below the Chicken Bridge (SR 1545), the Haw River flows through an area of resistant rock formations, creating a series of large rocky islands and extensive rapids well-known to local canoeists. Although the rock is mapped as igneous felsic complex, basalt flows occur along Dry Creek and diabase is prominent in several areas on the west side of the river. Along the northern shore of this site, a large area of alluvial soils is present, adding to the overall diversity of the area.

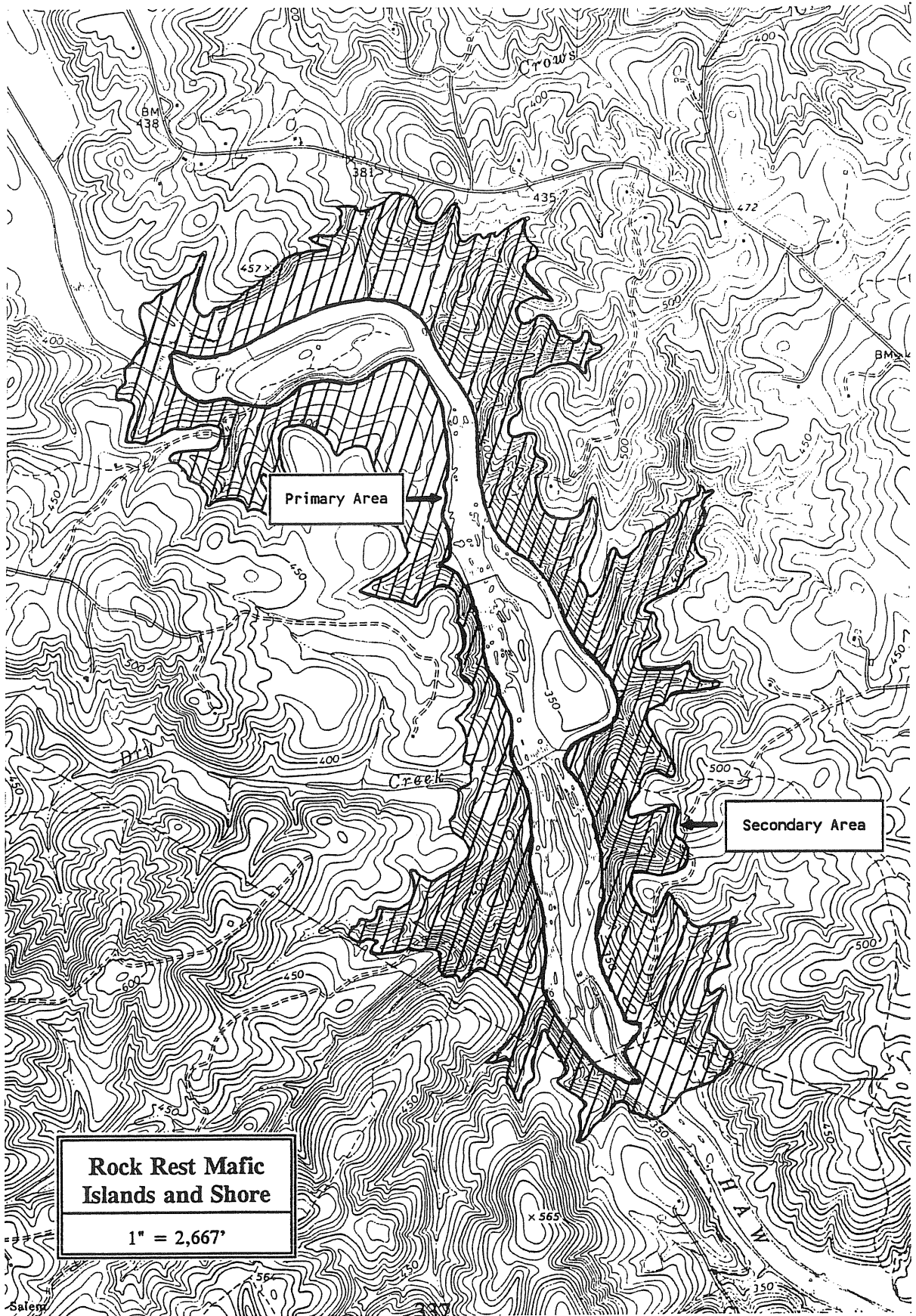
The forest on the western slopes along this reach reflect the diverse nature of the underlying rocks. The canopy contains elements of dry oak-hickory forest, such as post oak (*Quercus stellata*) and southern red oak (*Q. falcata*), and typical mesic species such as beech (*Fagus grandifolia*) and tulip tree (*Liriodendron tulipifera*), in a mixture with trees characteristic of basic sites, such as southern sugar maple (*Acer floridanum*) and southern shagbark hickory (*Carya carolinae-septentrionalis*). Redbud (*Cercis canadensis*) and buckeye (*Aesculus sylvatica*), further indicators of basic conditions, occur in the understory of the slopes. The woods along the river are made up of such characteristic levee species as river birch (*Betula nigra*), sycamore (*Platanus occidentalis*), sweetgum (*Liquidambar styraciflua*), and ironwood (*Carpinus caroliniana*) but also include plants indicative of richer soils, such as hackberry (*Celtis laevigata*), shagbark hickory (*Carya ovata*), bitternut hickory (*Carya cordiformis*), and hop hornbeam (*Ostrya virginiana*). Umbrella magnolia (*Magnolia tripetala*), rare in the

county and confined to the area of igneous formations, forms a large stand in this levee forest, as does pawpaw (Asimina triloba), a particularly good sign of rich soils.

All three visits to this site were made in November; consequently the list of fauna is fairly sparse although this site can be expected to support a large community of riparian birds similar to that described for the Duke Forest tract further downstream. Two noteworthy species present on this site are wild turkey (Meleagris gallopavo) and pileated woodpecker (Dryocopus pileatus), both of which require large tracts of forest. Despite the poor water quality of the Haw River, one species of freshwater mussel was found, the relatively tolerant eastern elliptio (Elliptio complanata).

CONSERVATION RECOMMENDATIONS:

The bluffs and riparian area along the west side of this site will likely be protected as part of a conservation easement obtained by the Triangle Land Conservancy; similar protection should be acquired for the eastern shore.



Primary Area

Secondary Area

**Rock Rest Mafic
Islands and Shore**
1" = 2,667'

SITE SURVEY REPORT

Site name: Rock Rest Mafic Islands and Shore
County: Chatham

Date(s): 3/XI/88, 7/XI/88, 19/XI/89

Surveyors:

Stephen P. Hall, Ph.D
NC Natural Heritage Program
P.O. Box 27687
Raleigh, NC 27611-7687
(919) 733-7701

Marjorie Boyer
NC Plant Conservation Program
P.O. Box 27647
Raleigh, NC 27611
(919) 733-3610

Size: 155 primary acres + 429 secondary acres = 584 total acres

Quad: Bynum

Province: Piedmont

Watershed: Haw River --> Cape Fear River

Location and directions: Section of the Haw River extending from large bend located 1.3 air miles SE of bridge on SR 1545 (Chicken Bridge) to confluence with Dry Creek; access by SR 1547 (Rock Rest Road)

Landowners and addresses:

Owners contacted and attitude: Site was toured with Gary Phillips, who is developing the tract and proposing to donate a conservation easement along the river to the Triangle Land Conservancy.

General landscape description: See Site Description

Physical description

Aspect: North and east

Slope: Flat to 10-35 on steeper bluffs

Topographic position: Lower slope and alluvial flats

Hydrology: Riverine

Moisture: Seasonally Wet

Elevation: 360 - 370'

Geology: Basalt flows, diabase, and slate series along river and lower slopes; granitic outcrops occur along the ridge, especially near old schoolhouse at the end of Rock Rest Road

Soils: Georgeville Silty Clay Loam

Comments on physical description: Some of the islands appear to be formed from resistant outcrops of basalt. A historic stage road runs along part of the shore.

Biological description

Community # 1: Basic Oak-Hickory Forest

Vegetation structure: Forest

Position in landscape and relation to other communities: Upper slopes to ridge

Quality and condition: Fair

Size:

Dominants (*) and important species:

Canopy:

Acer floridanum
Carya carolinae-septentrionalis
Fagus grandifolia
Liquidambar styraciflua
Liriodendron tulipifera
Quercus alba
Quercus falcata
Quercus nigra
Quercus rubra
Quercus stellata
Quercus velutina

Subcanopy:

Albizia julibrissin
Cercis canadensis
Juniperus virginiana

Shrubs and vines:

Aesculus sylvatica
Anisostichus capreolata
Elaeagnus umbellata
Euonymus americanus
Hamamelis virginiana
Kalmia latifolia
Lonicera japonica
Smilax bona-nox
Vaccinium arboreum

Herbs:

Chimaphila maculata
Cunila origanoides
Elephantopus carolinianus
Epifagus virginiana
Galium circaezans
Geum canadense
Goodyera pubescens
Hepatica americana
Hexastylis arifolia
Hexastylis minor
Mitchella repens
Polypodium virginianum
Polystichum acrostichoides
Prenanthes serpentaria
Ranunculus recurvatus
Scutellaria integrifolia
Sedum ternatum
Solidago caesia
Tiarella cordifolia
Uniola sessiliflora
Viola papilionacea

Biological description

Community # 2: Piedmont Alluvial Forest

Vegetation structure: Forest

Position in landscape and relation to other communities: Alluvial flat grading into lower slopes (pine plantations occur on the uplands above river)

Quality and condition: Fair

Size:

Dominants (*) and important species:

Canopy:

Acer floridanum
Betula nigra
Carya cordiformis
Carya ovata
Celtis laevigata
Fagus grandifolia
Liquidambar styraciflua
Pinus echinata
Pinus taeda
Platanus occidentalis
Quercus alba
Quercus nigra
Quercus rubra

Shrubs and vines:

Asimina triloba
Elaeagnus umbellata
Lindera benzoin
Smilax bona-nox
Symphoricarpos orbiculatus
Viburnum rafinesquianum
Vitis sp.

Herbs:

Botrychium biternatum
Saxifraga virginiana
Uniola latifolia

Subcanopy:

Carpinus caroliniana
Cornus florida
Ilex opaca
Ilex verticillata
Magnolia tripetala
Morus rubra
Ostrya virginiana

Special status species

State-listed species: None observed

Potential for other special status species: Should be checked for Gomphus septima in May

Other noteworthy species or features:

Animals:

rr Meleagris gallopavo

Communities:

Mafic plant communities

Geology:

Basalt islands

Site condition

Site integrity: Fair

Average DBH of canopy trees: 35 cm

Maximum DBH of canopy trees: 60 cm

Fire regime: Natural

Logged: Within last 20 years

Evenness of canopy: Mixed-age

Ditched/drained: No

Stream channelized: No

Dredged/filled: No

Understory cleared: Yes; some sections harvested for Red Cedar

Grazed: No

ORV damaged: No

Other disturbances: Clear-cuts and development for housing on adjacent areas

Adjacent Land Uses: Forest and residential

Significance of site: County

Discussion: See Site Description

Protection considerations and management needs: Planned conservation easement should be completed

Determination of survey boundaries: Encloses islands and less disturbed areas along the shore; a buffer-strip includes steep slopes on both sides of the river.

Priority for further study: Medium; islands were not surveyed

Specimens collected:

Photographs:

Others knowledgeable about the site: Alice Yeaman, Joe Jacob, Albert Radford

References:

Topo map:

Sketch map: None

PLANT SPECIES LIST

List is: Cursory

- Botrychium biternatum (6)
Polystichum acrostichoides (11)
Polypodium virginianum (14)
Pinus echinata (16)
Pinus taeda (16)
Juniperus virginiana (18)
Uniola latifolia (29)
Smilax bona-nox (41)
Goodyera pubescens (49)
Carya carolinae-
 septentrionalis (53)
Carya cordiformis (53)
Carya ovata (53)
Betula nigra (54)
Carpinus caroliniana (54)
Ostrya virginiana (54)
Fagus grandifolia (55)
Quercus alba (55)
Quercus falcata (55)
Quercus nigra (55)
Quercus rubra (55)
Quercus stellata (55)
Quercus velutina (55)
Celtis laevigata (56)
Morus rubra (57)
Hexastylis arifolia (62)
Hexastylis minor (62)
Hepatica americana (76)
Ranunculus recurvatus (76)
Liriodendron tulipifera (80)
Magnolia tripetala (80)
Asimina triloba (81)
Lindera benzoin (84)
Sedum ternatum (91)
Saxifraga virginiana (94)
Tiarella cordifolia (94)
Hamamelis virginiana (95)
Liquidambar styraciflua (95)
Platanus occidentalis (96)
Geum canadense (97)
Albizia julibrissin (98)
Cercis canadensis (98)
Ilex opaca (112)
Ilex verticillata (112)
Euonymus americanus (113)
Acer floridanum (115)
Aesculus sylvatica (116)
Vitis sp. (120)
Viola papilionacea (130)
Elaeagnus umbellata (134)
Cornus florida (142)
Chimaphila maculata (145)
Kalmia latifolia (145)
Vaccinium arboreum (145)
Cunila organoides (164)
Scutellaria integrifolia (164)
Anisostichus capreolata (167)
Epifagus virginiana (169)
Galium circaezans (173)
Mitchella repens (173)
Lonicera japonica (174)
Symphoricarpos orbiculatus
 (174)
Viburnum rafinesquianum (174)
Elephantopus carolinianus (179)
Prenanthes serpentaria (179)
Solidago caesia (179)

ANIMAL SPECIES LIST

List is: Cursory (surveyed outside nesting season)

Vertebrates:

- i Aix sponsa
- Cathartes aura
- rr Meleagris gallopavo *
- Melanerpes carolinus
- Picoides pubescens
- i Dryocopus pileatus
- Sayornis phoebe
- Parus carolinensis
- Parus bicolor
- Thryothurus ludovicianus
- Turdus migratorius
- Pipilo erythrophthalmus
- Sylvilagus floridanus
- Sciurus carolinensis
- Castor canadensis
- Procyon lotor
- Odocoileus virginianus
- i Terrapene carolina
- Elaphe obsoleta
- Hyla crucifer

Invertebrates:

- Elliptio complanata

SITE NAME: Buckhorn Bluffs and Levees

SIGNIFICANCE: County

INTEGRITY: Fair

THREATS: Medium -- clearcutting of adjoining areas

PROTECTION STATUS: Managed as gamelands by the NC Wildlife Commission through short-term lease with the landowner

JURISDICTION: Cape Fear Township

OWNERSHIP:

SUMMARY OF SIGNIFICANT FEATURES:

1. Buttercup phacelia (Phacelia ranunculacea), a candidate for state listing, grows abundantly on the rich levees present at this site.
2. This site has the most mature and most extensive levee forest in the county.

GENERAL SITE DESCRIPTION:

Just a few miles to the west of this site, the Haw and Deep Rivers join together to form the Cape Fear in the broad bottomlands of the Triassic Basin. Almost immediately, The Cape Fear enters the slate-belt and flows through some extremely rugged terrain before reaching the Fall Line a few miles downstream in Harnett County at Raven Rock State Park. Although hemmed in by steep bluffs on both sides, this initial reach of the Cape Fear is relatively wide even below the low impoundment created by the Buckhorn Dam. Several large areas of alluvial bottomlands are present along the northeast shore, and in some areas levee deposits have created extensive islands, the most distinctive feature of this site.

Levee forests are usually restricted to narrow bands along the larger rivers, and most broad areas of bottomland have been thoroughly exploited with little original forest left. The levee forest at this site is thus noteworthy both for the large area it covers and for the fact that it has been little disturbed, particularly on the larger islands where flooding is frequent and accessibility is limited. On the islands, American elm (Ulmus americana), sweet gum (Liquidambar styraciflua), southern sugar maple (Acer floridanum), bitternut hickory (Carya cordiformis) and swamp chestnut oak (Quercus michauxii) dominate a canopy composed of mature trees up to 72 cm diameter. Shrubs and vines are plentiful, including pawpaw (Asimina triloba), spicebush (Lindera benzoin), possumhaw (Ilex decidua), storax (Styrax grandifolia), greenbriers (Smilax spp.), poison ivy (Toxicodendron radicans) and crossvine (Anisostichus capreolata). In this mature forest the herbs are sparse but fairly diverse, especially on higher spots where such species as Jack-in-the-pulpit (Arisaema triphyllum), broad beech fern (Thelypteris hexagonoptera) and bloodroot (Sanguinaria canadensis) occur.

On the mainland portion of the alluvial flats the forest is much younger, with trees 10-20 years old and many saplings, mostly of elm, southern sugar maple, box elder (Acer negundo) and hackberry (Celtis laevigata). Shrubs are few but the herb layer is dense. It is in this area that a broad carpet of the rare buttercup phacelia can be found in the spring, along with such common bottomland herbs as chickweed (Stellaria media), spring beauty (Claytonia virginica), and sweet cicely (Osmorhiza longistylis).

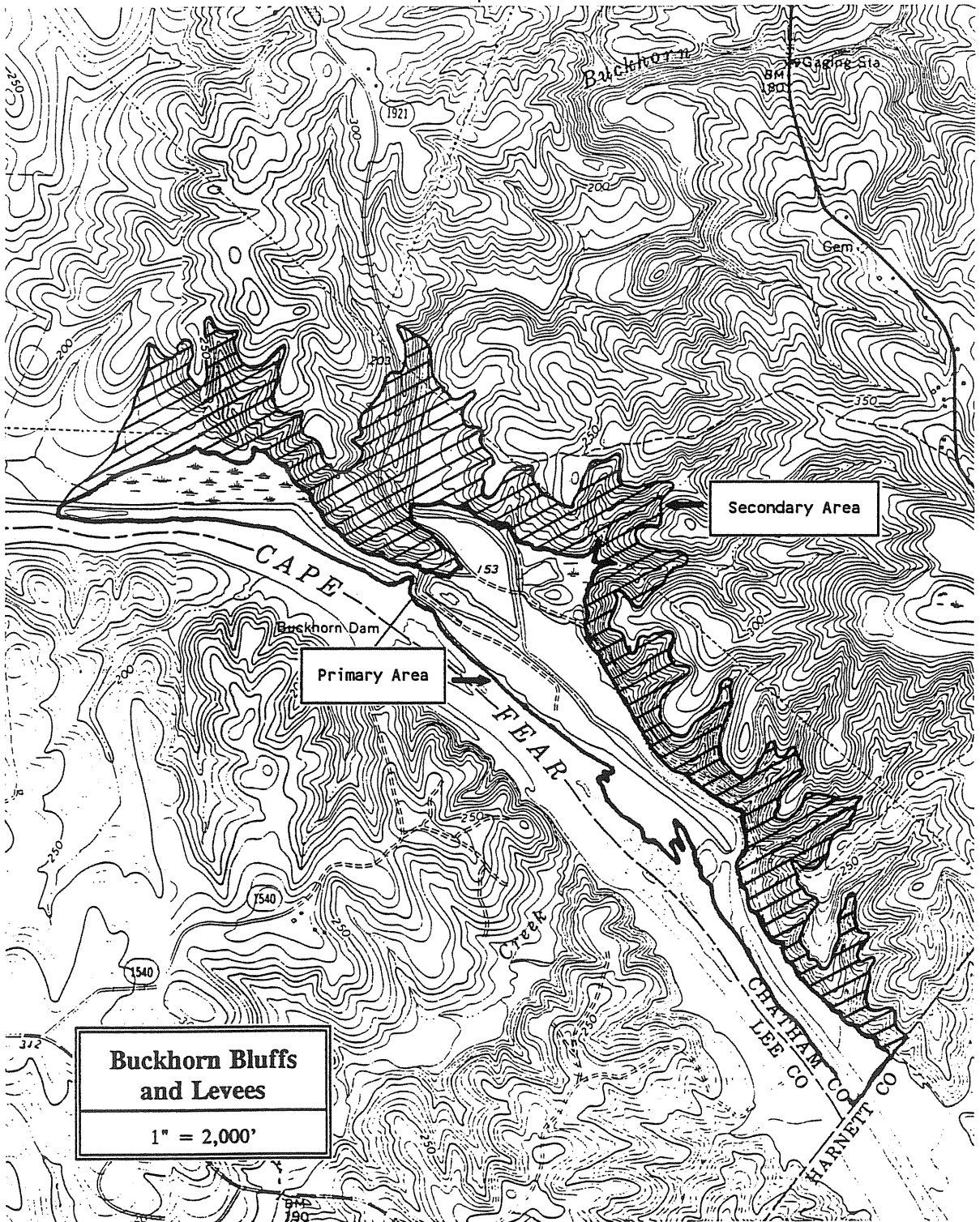
A typical mesic mixed-hardwood forest occupies the steep slopes bordering the bottomlands at this site. While some patches of this forest are fairly intact, most of the area shows the effects of considerable disturbance and exploitation.

The faunal list for this site is relatively incomplete, reflecting visits made outside the main nesting season for birds. No prothonotary warblers or redstarts were observed, for instance, despite the presence of suitable habitat; the only riparian forest birds we recorded during our April visit were the yellow-throated warbler (Dendroica dominica) and the northern parula warbler (Parula americana), both of which are early migrants. One species of riparian bird that should be especially looked for at this site is the cerulean warbler (Dendroica cerulea), an animal that is virtually restricted in North Carolina to old-growth levee forests along major rivers.

The most noteworthy animals actually observed were the Carolina anole (Anolis carolinensis), which penetrates the piedmont up from the coastal plain primarily along river floodplains, and two typically montane species, the sumo mite (Allothrombium sp.) and a landsnail (Mesomphix sp.), both of which may have been rafted across the river from the steep north-facing slopes on the Lee County side of the river. The presence of river otter (Lutra canadensis), gray fox (Urocyon cinereoargenteus), and pileated woodpecker (Dryocopus pileatus) is indicative of the large amount of undeveloped forest in this part of the county.

CONSERVATION RECOMMENDATIONS:

The bottomlands and levees leased by the NC Wildlife Resources Commission should be spared from further timbering; too little of this type of forest -- critical to wildlife -- exists in a mature state in North Carolina. Further protection for the overall natural area must also involve the preservation of buffer strips of forest left along the slopes and ridge crests above the bottomlands; this might be best approached through the acquisition of conservation easements or a change in forestry management practices to favor selective harvest over clearcutting.



**Buckhorn Bluffs
and Levees**
1" = 2,000'

SITE SURVEY REPORT

Site name: Buckhorn Bluffs and Levees
County: Chatham

Date(s): 26/X/88, 13/IV/89

Surveyors:

Stephen P. Hall, Ph.D
NC Natural Heritage Program
P.O. Box 27687
Raleigh, NC 27611-7687
(919) 733-7701

Marjorie Boyer
NC Plant Conservation Program
P.O. Box 27647
Raleigh, NC 27611
(919) 733-3610

Size: 325 primary acres + 334 secondary acres = 659 total acres

Quad: Cokesbury

Province: Piedmont

Watershed: Cape Fear River

Location and directions: North shore of Cape Fear River adjacent to Buckhorn Dam; 1.7 miles south of Corinth on SR 1921

Landowners and addresses:

Owners contacted and attitude:

General landscape description: See Site Description

Physical description

Aspect: Southwest

Slope: Flat (10-35 on slopes within secondary area)

Topographic position: Lower slope and alluvial flats

Hydrology: Terrestrial and riverine

Moisture: Mesic to frequently flooded

Elevation: 150 - 200'

Geology: Outcrops of mica schists

Soils: Wehadkee Silt Loam (island and floodplain); Appling Stony Sandy Loam (steep phase) and Cecil Clay Loam (slopes)

Comments on physical description: Area of steep river bluffs, large islands and bottomland forests along the initial segment of one of North Carolina's major rivers.

Biological description

Community # 1: Mesic-mixed Hardwood Forest

Vegetation structure: Forest

Position in landscape and relation to other communities: Lower slope

Quality and condition: Fair

Size:

Dominants (*) and important species:

Canopy:

Fagus grandifolia *
Fraxinus sp.
Quercus alba
Quercus rubra *

Subcanopy:

Acer rubrum
Cornus florida
Ilex opaca
Ostrya virginiana

Shrubs and vines:

Anisostichus capreolata
Rhododendron nudiflorum
Styrax grandifolia
Viburnum acerifolium
Vitis sp.

Herbs:

rr *Amsonia tabernaemontana*
Athyrium asplenioides
Chrysogonum virginianum
Cimicifuga racemosa
Dioscorea villosa
Epifagus virginiana
Galium circaezans
Galium obtusum
var. *filifolium*
Hepatica americana
Hexastylis arifolia
Houstonia caerulea
Mitchella repens
Oxalis violacea
Polystichum acrostichoides
Prenanthes altissima
Sanicula canadensis
Thelypteris hexagonoptera
Tiarella cordifolia
Tipularia discolor
Uvularia sessilifolia

Community # 2: Piedmont Levee Forest

Vegetation structure: Forest

Position in landscape and relation to other communities: Alluvial flats

Quality and condition: Fair

Size:

Dominants (*) and important species:

Canopy:

Acer floridanum *
Acer negundo
Betula nigra
Carya cordiformis *
Celtis laevigata
Fagus grandifolia
Fraxinus pennsylvanica
 var. *subintegerrima*
Juglans nigra
Liquidambar styraciflua *
Liriodendron tulipifera
Platanus occidentalis
Quercus michauxii
Quercus nigra
Quercus rubra
Salix nigra
Ulmus alata
Ulmus americana *

Shrubs and vines:

Aesculus sylvatica
Anisostichus capreolata
Arundinaria gigantea
Asimina triloba
Cornus amomum
Corylus americana
Ilex decidua
Ligustrum sinense
Lindera benzoin
Lonicera japonica
Lonicera sempervirens
Parthenocissus quinquefolia
Rhus radicans
Sambucus canadensis
Smilax rotundifolia
Staphylea trifolia
Styrax grandifolia
Viburnum dentatum
 var. *lucidum*

Subcanopy:

Ailanthus altissima
Amelanchier arborea
Carpinus caroliniana
Cornus florida
Ilex opaca
Morus rubra

Herbs:

Allium vineale
Arisaema triphyllum
Aster divaricatus
Botrychium virginianum
Cardamine hirsuta
rr Carex jamesii
Cimicifuga racemosa
Claytonia virginica
Corydalis flavula
Duchesnea indica
Galium aparine
Galium circaezans
Geranium maculatum
Hexastylis arifolia
Impatiens capensis
Lamium purpureum
Laportea canadensis
Luzula acuminata
Lysimachia nummularia
Melica mutica
Myosotis verna
Nemophila microcalyx
Onoclea sensibilis
Osmorhiza longistylis
c Phacelia ranunculacea
Phytolacca americana
Podophyllum peltatum
Polygonatum biflorum
Polystichum acrostichoides
Ranunculus abortivus
Sanguinaria canadensis
Sanicula canadensis
Stellaria media
Thelypteris hexagonoptera
Viola papilionaceae
Woodwardia areolata

Special status species

State-listed species:

Plants:

c Phacelia ranunculacea

Potential for other special status species:

Other noteworthy species or features:

Plants:

rr Carex jamesii
rr Amsonia tabernaemontana

Animals:

rr Melanerpes erythrocephalus
rr Lutra canadensis
rr Anolis carolinesis

Communities:

Mature bottomland
Largest tract of levee forest in Chatham County

Site condition

Site integrity: Fair

Average DBH of canopy trees: 30-35 cm

Maximum DBH of canopy trees: 72 cm

Fire regime: Natural

Logged: Within last 30-40 years

Evenness of canopy: Natural

Ditched/drained: No

Stream channelized: No

Dredged/filled: No

Understory cleared: No

Grazed: No

ORV damaged: Yes; area receives heavy recreational use

Other disturbances: No

Adjacent Land Uses: Forest

Significance of site: County

Discussion: See Site Description

Protection considerations and management needs: Currently managed as gamelands by NC Wildlife Resources Commission; forest should be allowed to mature, both on bottomlands and on the slopes

Determination of survey boundaries: Encloses large islands and bottomland forests; secondary natural area includes steep slopes above the river

Priority for further study: Medium

Specimens collected:

Photographs: Phacelia ranunculacea

Others knowledgeable about the site:

References:

Topo map: Attached

Sketch map:

PLANT SPECIES LIST

List is: Nearly Complete

- | | |
|---|---|
| <p> <i>Botrychium virginianum</i> (6)
 <i>Athyrium asplenioides</i> (11)
 <i>Onoclea sensibilis</i> (11)
 <i>Polystichum acrostichoides</i> (11)
 <i>Thelypteris hexagonoptera</i> (11)
 <i>Woodwardia areolata</i> (12)
 <i>Arundinaria gigantea</i> (29)
 <i>Melica mutica</i> (29)
 rr <i>Carex jamesii</i> (30)
 <i>Arisaema triphyllum</i> (32)
 <i>Luzula acuminata</i> (40)
 <i>Allium vineale</i> (41)
 <i>Polygonatum biflorum</i> (41)
 <i>Smilax rotundifolia</i> (41)
 <i>Uvularia sessilifolia</i> (41)
 <i>Dioscorea villosa</i> (43)
 <i>Tipularia discolor</i> (49)
 <i>Salix nigra</i> (51)
 <i>Carya cordiformis</i> (53)
 <i>Juglans nigra</i> (53)
 <i>Betula nigra</i> (54)
 <i>Carpinus caroliniana</i> (54)
 <i>Corylus americana</i> (54)
 <i>Ostrya virginiana</i> (54)
 <i>Fagus grandifolia</i> (55)
 <i>Quercus alba</i> (55)
 <i>Quercus michauxii</i> (55)
 <i>Quercus nigra</i> (55)
 <i>Quercus rubra</i> (55)
 <i>Celtis laevigata</i> (56)
 <i>Ulmus alata</i> (56)
 <i>Ulmus americana</i> (56)
 <i>Morus rubra</i> (57)
 <i>Laportea canadensis</i> (59)
 <i>Hexastylis arifolia</i> (62)
 <i>Phytolacca americana</i> (68)
 <i>Claytonia virginica</i> (70)
 <i>Stellaria media</i> (71)
 <i>Cimicifuga racemosa</i> (76)
 <i>Hepatica americana</i> (76)
 <i>Ranunculus abortivus</i> (76) </p> | <p> <i>Podophyllum peltatum</i> (77)
 <i>Liriodendron tulipifera</i> (80)
 <i>Asimina triloba</i> (81)
 <i>Lindera benzoin</i> (84)
 <i>Sanguinaria canadensis</i> (85)
 <i>Corydalis flavula</i> (86)
 <i>Cardamine hirsuta</i> (88)
 <i>Tiarella cordifolia</i> (94)
 <i>Liquidambar styraciflua</i> (95)
 <i>Platanus occidentalis</i> (96)
 <i>Amelanchier arborea</i> (97)
 <i>Duchesnea indica</i> (97)
 <i>Oxalis violacea</i> (100)
 <i>Geranium maculatum</i> (101)
 <i>Ailanthus altissima</i> (104)
 <i>Rhus radicans</i> (110)
 <i>Ilex decidua</i> (112)
 <i>Ilex opaca</i> (112)
 <i>Staphylea trifolia</i> (114)
 <i>Acer floridanum</i> (115)
 <i>Acer negundo</i> (115)
 <i>Acer rubrum</i> (115)
 <i>Aesculus sylvatica</i> (116)
 <i>Impatiens capensis</i> (118)
 <i>Parthenocissus</i>
 <i>quinquefolia</i> (120)
 <i>Vitis</i> sp. (120)
 <i>Viola papilionaceae</i> (130)
 <i>Osmorhiza longistylis</i> (140)
 <i>Sanicula canadensis</i> (140)
 <i>Cornus amomum</i> (142)
 <i>Cornus florida</i> (142)
 <i>Rhododendron nudiflorum</i> (145)
 <i>Lysimachia nummularia</i> (147)
 <i>Styrax grandifolia</i> (152)
 <i>Fraxinus pennsylvanica</i>
 var. <i>subintegerrima</i>
 (153)
 <i>Fraxinus</i> sp. (153)
 <i>Ligustrum sinense</i> (153)
 rr <i>Amsonia tabernaemontana</i> (156) </p> |
|---|---|

- c Nemophila microcalyx (160)
- Phacelia ranunculacea (160)
- Myosotis verna (161)
- Lamium purpureum (164)
- Anisostichus capreolata (167)
- Epifagus virginiana (169)
- Galium aparine (173)
- Galium circaezans (173)
- Galium obtusum
 - var. filifolium (173)
- Houstonia caerulea (173)
- Mitchella repens (173)
- Lonicera japonica (174)
- Lonicera sempervirens (174)
- Sambucus canadensis (174)
- Viburnum acerifolium (174)
- Viburnum dentatum
 - var. lucidum (174)
- Aster divaricatus (179)
- Chrysogonum virginianum (179)
- Prenanthes altissima (179)

ANIMAL SPECIES LIST

List is: Cursory -- sampled outside the main nesting season for birds

Vertebrates:

i Aix sponsa
 Megaceryle alcyon
 rr Melanerpes erythrocephalus
 Melanerpes carolinus
 Picoides pubescens
 Colaptes auratus
 i Dryocopus pileatus
 Progne subis
 Parus carolinensis
 Parus bicolor
 Thryothurus ludovicianus
 Polioptila caerulea
 Vireo olivaceus
 Parula americana
 Dendroica dominica
 Cardinalis cardinalis
 Castor canadensis
 i Urocyon cinereoargenteus
 rr Lutra canadensis
 Chrysemys sp.
 rr Anolis carolinesis
 Plethodon glutinosus
 Acris sp.

Invertebrates:

i Eurytides marcellus
 Anthocharis midea
 Libytheana bachmanii
 Polygonia interrogationis
 Polygonia comma
 Nymphalis antiopa
 Vanessa virginiensis
 Cyllopsis gemma
 Epargyreus clarus
 Erynnis juvenalis
 rr Allothrombium sp.
 rr Mesomphix sp.
 Haplotrema concavum

