

**SITE NAME:** 902 Laurel Bluffs and Mussel Beds

**SIGNIFICANCE:** State

**INTEGRITY:** Good to fair

**THREATS:** High -- water quality degradation due to Siler City wastewater

**PROTECTION STATUS:** None

**JURISDICTION:** Hickory Mountain

**OWNERSHIP:** Private

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

1. This reach of the Rocky River, at one time at least, possessed one of the most diverse mussel faunas remaining in the Piedmont. Species found during the course of the inventory include the brook floater (*Alasmidonta varicosa*) and squawfoot (*Strophitus undulatus*), both of which have been proposed for threatened status in North Carolina.
2. Septima's clubtail dragonfly (*Gomphus septima*), a candidate for federal listing, was also observed at this site during the course of the inventory.
3. Historically at least, this reach of the Rocky River was inhabited by the Cape Fear shiner (*Notropis mekistocholas*), a species federally listed as Endangered.
4. The laurel bluffs, rocky outcrops, and strips of bottomland forest combine to make this one of the more scenic reaches of river in the county.

### **GENERAL SITE DESCRIPTION:**

The rocky riffles and pools that are prominent features of the lower Rocky River are well-developed in this particular reach. At certain points, nearly vertical outcrops of felsic, crystalline tuffs occur, and the entire south slope is quite steep.

The most outstanding biological feature of this site is its diverse community of aquatic animals, several of which are becoming increasingly rare throughout the state or even nationwide. Six species of mussels were found during the inventory, including the state-threatened brook floater and squawfoot, and the uncommon notched rainbow (*Villosa constricta*). Septima's clubtail dragonfly, a federal candidate species, was also found here; this is a species that is known to occur only in the Rocky, Deep, and Haw Rivers in Chatham County. This reach was additionally within the historic range of the federally-endangered Cape Fear shiner, and is still likely to support a population. Other significant species of animals are the regionally rare otter (*Lutra canadensis*), and a rich variety of riparian birds, including the American redstart (*Setophaga ruticilla*), prothonotary warbler (*Protonotaria citrea*), northern parula warbler (*Parula americana*), yellow-throated warbler (*Dendroica dominica*), Louisiana waterthrush (*Seiurus motacilla*), Acadian flycatcher (*Empidonax virescens*), eastern phoebe (*Sayornis phoebe*), and kingfisher (*Megaceryle alcyon*).

The diversity of avian species in turn reflects the presence of relatively mature forests on either side of the river. While the dry-mesic oak-hickory forest on the adjacent uplands is fairly young, the steep bluffs on the south side of the river have escaped intense timbering and are covered with mountain laurel interspersed with large specimens of beech (Fagus grandifolia), red oak (Quercus rubra), and white oak (Q. alba). Southern sugar maple (Acer floridanum), wild hydrangea (Hydrangea arborescens) and barren strawberry (Waldsteinia fragaroides), plants characteristic of richer sites, are also found on these bluffs, while a small ravine cutting through the bluffs features black walnut (Juglans nigra), southern shagbark hickory (Carya carolinae-septentrionalis), and a diversity of mesic forest wildflowers.

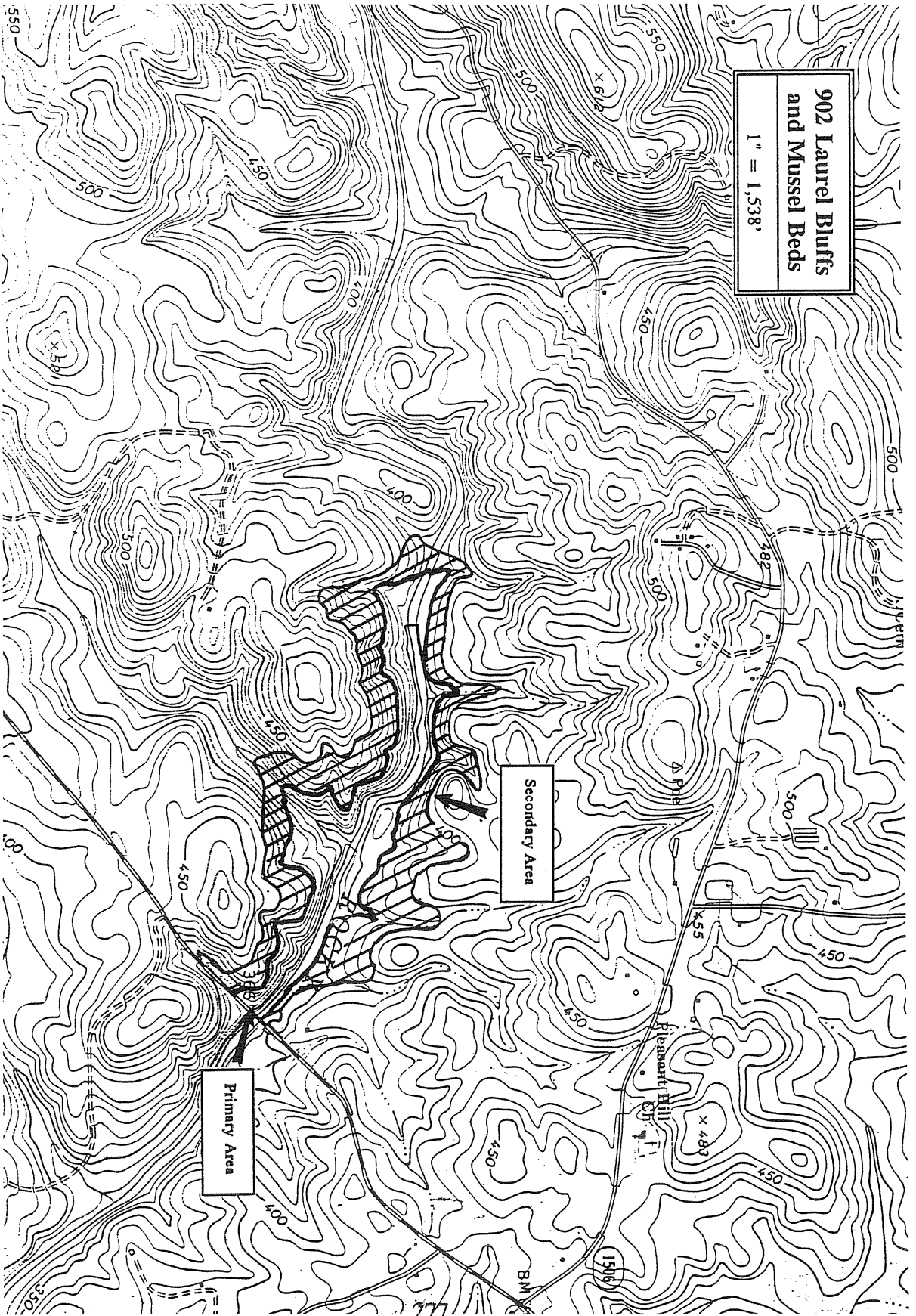
On the north side of the river, a mesic mixed hardwood forest of medium age occupies moderately-sloping land and also possess a variety of wildflowers, including bloodroot (Sanguinaria canadensis), mayapple (Podophyllum peltatum), hepatica (Hepatica americana), spring beauty (Claytonia virginica) and green-and-gold (Chrysogonum virginianum). Large areas of the bottomland along this side of the river are covered with canebrakes (Arundinaria gigantea) and dense stands of privet (Ligustrum sinense).

#### CONSERVATION RECOMMENDATIONS:

There are two main threats to the ecological integrity of this site, and indeed all sites along the Rocky River. These are the effluents discharged from the Siler City wastewater plant and non-point sources of runoff from agricultural lands bordering the river. At this particular site, a large field extends down to the water's edge with no intervening buffer of vegetation.

Apart from system-wide improvements to water quality, conservation efforts at this site should include protection of the forested lands bordering the river, not only for their buffering action, but also for their significance as an important wildlife habitat and movement corridor, their diversity of plant species, and their scenic values. Protection can be accomplished in several ways: through conservation easements, through fee-simple purchase by a conservation organization, or through changes in land use by the current owners.

902 Laurel Bluffs  
and Mussel Beds  
1" = 1,538'





## **SITE SURVEY REPORT**

**Site name:** 902 Laurel Bluffs and Mussel Beds  
**County:** Chatham

**Date(s):** 16/XI/88, 19/III/89, 30/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:** 63 primary acres + 90 secondary acres = 153 total acres

**Quad:** Siler City, Northeast

**Province:** Piedmont

**Watershed:** Rocky River --> Deep River --> Cape Fear River

**Location and directions:** Section of Rocky River upstream from bridge at NC 902

**Landowners and addresses:**

**Owners contacted and attitude:**

**General landscape description:** See Site Description

### **Physical description**

**Aspect:** North

**Slope:** 10-35 on steepest slopes

**Topographic position:** Upper slope to midstream

**Hydrology:** Terrestrial and riverine

**Moisture:** Moist to submerged

**Elevation:** 500 - 340'

**Geology:** Felsic Crystalline Tuffs

**Soils:** Georgeville Stony Silt Loam, Georgeville Silty Clay Loam

**Comments on physical description:** The many riffles occurring at this site provide optimum habitat for the large number of listed mussels that have been collected here.

## Biological description

### Community # 1: Dry-mesic Oak-hickory Forwst

**Vegetation structure:** Forest

**Position in landscape and relation to other communities:** Steep slopes on south side of river

**Quality and condition:** Good to fair

**Size:**

**Dominants (\*) and important species:**

#### Canopy:

Betula nigra  
Carya carolinae-septentrionalis  
Carya ovata  
Fagus grandifolia  
Juglans nigra  
Liquidambar styraciflua  
Pinus echinata  
Platanus occidentalis  
Quercus alba  
Quercus coccinea  
Quercus phellos  
Quercus rubra  
Quercus velutina

#### Subcanopy:

Acer floridanum  
Acer rubrum  
Carpinus caroliniana  
Cornus florida  
Ilex decidua  
Ilex opaca  
Juniperus virginiana  
Nyssa sylvatica  
Oxydendrum arboreum

#### Shrubs and vines:

Alnus serrulata  
Anisostichus capreolata  
Elaeagnus umbellata  
Euonymus americanus  
Hamamelis virginiana  
Hydrangea arborescens  
Hypericum sp.  
Kalmia latifolia  
Leucothoe racemosa  
Ligustrum sinense  
Lonicera japonica  
Rhododendron nudiflorum  
Rosa carolina  
Smilax rotundifolia  
Vaccinium stamineum  
Vaccinium vacillans  
Viburnum acerifolium  
Viburnum dentatum  
var. lucidum  
Viburnum prunifolium  
Xanthorrhiza simplicissima

## Biological description

### Community # 2: Mesic Mixed-hardwood Forest

**Vegetation structure:** Forest

**Position in landscape and relation to other communities:** Moderate slopes on north side of river

**Quality and condition:** Good

**Size:**

### **Dominants (\*) and important species:**

#### Canopy:

*Acer rubrum*  
*Carya ovata*  
*Celtis laevigata*  
*Fagus grandifolia*  
*Liriodendron tulipifera*  
*Platanus occidentalis*  
*Quercus alba*  
*Quercus pagoda*  
*Quercus rubra*

#### Subcanopy:

*Carpinus caroliniana*  
*Ilex opaca*  
*Oxydendrum arboreum*

#### Shrubs and vines:

*Aesculus sylvatica*  
*Anisostichus capreolata*  
*Arundinaria gigantea*  
*Elaeagnus umbellata*  
*Euonymus americanus*  
*Ligustrum sinense*  
*Lonicera japonica*  
*Lyonia mariana*  
*Rubus* sp.  
*Viburnum prunifolium*  
*Vitis* sp.

#### Herbs:

*Allium vineale*  
*Asplenium platyneuron*  
*Botrychium virginianum*  
*Cardamine angustata*  
*Cardamine hirsuta*  
*Chimaphila maculata*  
*Chrysogonum virginianum*  
*Claytonia virginica*  
*Corydalis flavula*  
*Erythronium umbilicatum*  
*Fragaria virginiana*  
*Galium circaezans*  
*Galium triflorum*  
*Goodyera pubescens*  
*Hepatica americana*  
*Hexastylis arifolia*  
*Houstonia caerulea*  
*Lamium purpureum*  
*Podophyllum peltatum*  
*Polystichum acrostichoides*  
*Potentilla canadensis*  
*Salvia lyrata*  
*Sanguinaria canadensis*  
*Stellaria media*  
*Stellaria pubera*  
*Thalictrum thalictroides*  
*Tiarella cordifolia*  
*Tipularia discolor*  
*Veronica hederifolia*  
*Viola papilionacea*  
*Viola rafinesquii*

## Special status species

### State-listed species:

#### Animals:

fe	Notropis mekistocholas
st	Strophitus undulatus
st	Alasmodonta varicosa
fc	Gomphus (gomphurus) septima
st	Alasmodonta varicosa

**Potential for other special status species:** High; several other species of state-listed mussels have been recorded from nearby sections of the Rocky River

### Other noteworthy species or features:

#### Animals:

sr	Villosa constricta
rr	Lutra canadensis

## Site condition

**Site integrity:** High (mussel habitat) to fair (forest)

**Average DBH of canopy trees:** 40 cm (south side), 30 cm (north)

**Maximum DBH of canopy trees:** 57 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:** ATV trail on north side

**Other disturbances:** No

**Adjacent Land Uses:** Forest, agriculture

**Significance of site:** State (as part of Rocky River system)

**Discussion:** See Site Description



**Protection considerations and management needs:** The presence of several species of state and federally listed animals within this river system warrants the highest level of protection; the entire Rocky River should be included in the state's High Quality Waters program; this particular area should be registered as a state natural area and a conservation easement should be negotiated.

**Determination of survey boundaries:** Encloses area of steep slopes, bottomlands, and riffles upstream of NC 902

**Priority for further study:** High; a thorough survey of the mussels, fish, and other riverine fauna should be conducted.

**Specimens collected:** Gomphus septima

**Photographs:**

**Others knowledgeable about the site:** R. Shelley, J. Alderman

**References:**

Shelley, R. 1987. Unionid Mollusks from the upper Cape Fear river basin, North Carolina, with a comparison of the faunas of the Neuse, Tar, and Cape Fear drainages (Bivalvia: Unionacea). *Brimleyana* 13:67-89.

**Topo map:** Attached

**Sketch map:** None

## PLANT SPECIES LIST

List is: Medium Thorough

- |  |  |
|--|--|
| <p> <i>Botrychium biternatum</i> (6)<br/> <i>Botrychium virginianum</i> (6)<br/> <i>Polystichum acrostichoides</i> (11)<br/> <i>Asplenium platyneuron</i> (13)<br/> <i>Polypodium polypodioides</i> (14)<br/> <i>Pinus echinata</i> (16)<br/> <i>Juniperus virginiana</i> (18)<br/> <i>Arundinaria gigantea</i> (29)<br/> <i>Uniola latifolia</i> (29)<br/> <i>Allium vineale</i> (41)<br/> <i>Chamaelirium luteum</i> (41)<br/> <i>Erythronium umbilicatum</i> (41)<br/> <i>Smilax rotundifolia</i> (41)<br/> <i>Goodyera pubescens</i> (49)<br/> <i>Tipularia discolor</i> (49)<br/> <i>Carya carolinae-</i><br/> <i>septentrionalis</i> (53)<br/> <i>Carya ovata</i> (53)<br/> <i>Juglans nigra</i> (53)<br/> <i>Alnus serrulata</i> (54)<br/> <i>Betula nigra</i> (54)<br/> <i>Carpinus caroliniana</i> (54)<br/> <i>Fagus grandifolia</i> (55)<br/> <i>Quercus alba</i> (55)<br/> <i>Quercus coccinea</i> (55)<br/> <i>Quercus falcata</i><br/> <i>var. pagodaefolia</i> (55)<br/> <i>Quercus phellos</i> (55)<br/> <i>Quercus rubra</i> (55)<br/> <i>Quercus velutina</i> (55)<br/> <i>Celtis laevigata</i> (56)<br/> <i>Hexastylis arifolia</i> (62)<br/> <i>Hexastylis minor</i> (62)<br/> <i>Claytonia virginica</i> (70)<br/> <i>Stellaria media</i> (71)<br/> <i>Stellaria pubera</i> (71)<br/> <i>Hepatica americana</i> (76)<br/> <i>Thalictrum thalictroides</i> (76)<br/> <i>Xanthorhiza simplicissima</i> (76)<br/> <i>Podophyllum peltatum</i> (77)<br/> <i>Liriodendron tulipifera</i> (80)                 </p> | <p> <i>Sanguinaria canadensis</i> (85)<br/> <i>Corydalis flavula</i> (86)<br/> <i>Cardamine angustata</i> (88)<br/> <i>Cardamine hirsuta</i> (88)<br/> <i>Hydrangea arborescens</i> (94)<br/> <i>Tiarella cordifolia</i> (94)<br/> <i>Hamamelis virginiana</i> (95)<br/> <i>Liquidambar styraciflua</i> (95)<br/> <i>Platanus occidentalis</i> (96)<br/> <i>Fragaria virginiana</i> (97)<br/> <i>Potentilla canadensis</i> (97)<br/> <i>Rosa carolina</i> (97)<br/> <i>Rubus sp.</i> (97)<br/> <i>Waldsteinia fragarioides</i> (97)<br/> <i>Ilex decidua</i> (112)<br/> <i>Ilex opaca</i> (112)<br/> <i>Euonymus americanus</i> (113)<br/> <i>Acer floridanum</i> (115)<br/> <i>Acer rubrum</i> (115)<br/> <i>Aesculus sylvatica</i> (116)<br/> <i>Vitis sp.</i> (120)<br/> <i>Hypericum sp.</i> (126)<br/> <i>Viola papilionacea</i> (130)<br/> <i>Viola rafinesquii</i> (130)<br/> <i>Viola sp.</i> (130)<br/> <i>Elaeagnus umbellata</i> (134)<br/> <i>Sanicula smallii</i> (140)<br/> <i>Thaspium barbinode</i> (140)<br/> <i>Nyssa sylvatica</i> (141)<br/> <i>Cornus florida</i> (142)<br/> <i>Chimaphila maculata</i> (145)<br/> <i>Leucothoe racemosa</i> (145)<br/> <i>Lyonia mariana</i> (145)<br/> <i>Oxydendrum arboreum</i> (145)<br/> <i>Rhododendron nudiflorum</i> (145)<br/> <i>Vaccinium stamineum</i> (145)<br/> <i>Vaccinium vacillans</i> (145)<br/> <i>Ligustrum sinense</i> (153)<br/> <i>Lamium purpureum</i> (164)<br/> <i>Salvia lyrata</i> (164)<br/> <i>Veronica hederaefolia</i> (166)                 </p> |
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Anisostichus capreolata (167)  
Galium circaezans (173)  
Galium triflorum (173)  
Houstonia caerulea (173)  
Mitchella repens (173)  
Lonicera japonica (174)  
Viburnum acerifolium (174)  
Viburnum dentatum  
    var. lucidum (174)  
Viburnum prunifolium (174)  
Aster divaricatus (179)  
Chrysogonum virginianum (179)  
Rudbeckia laciniata (179)  
Solidago caesia (179)

## ANIMAL SPECIES LIST

List is: Medium-thorough

### Vertebrates:

Ardea herodias  
 Zenaida macroura  
 Archilochus colubris  
 Megaceryle alcyon  
 Picoides pubescens  
 Contopus virens  
 Empidonax virescens  
 Sayornis phoebe  
 Progne subis  
 Parus carolinensis  
 Parus bicolor  
 Thryothurus ludovicianus  
 Polioptila caerulea  
 Hylocichla mustelina  
 Vireo flavifrons  
 Vireo olivaceus  
 Parula americana  
 Dendroica dominica  
 i Setophaga ruticilla  
 i Protonotaria citrea  
 i Seiurus aurocapillus  
 i Seiurus motacilla  
 Piranga olivacea  
 Cardinalis cardinalis  
 Molothrus ater  
 Carduelis tristis  
 Tamias striatus  
 Sciurus carolinensis  
 Castor canadensis  
 Procyon lotor  
 π Lutra canadensis  
 Odocoileus virginianus  
 Bufo woodhousei fowleri  
 Hyla chrysoscelis  
 fe Notropis mekistocholas

### Invertebrates:

Papilio glaucus  
 Phoebis sennae eubule  
 Celastrina ladon  
 Libytheana bachmanii  
 Polygonia interrogationis  
 Nymphalis antiopa  
 Pompeius verna  
 fc Gomphus gomphurus septima  
 Gomphus gomphus exilis  
 i Epiaeschna heros  
 Epicordulia regina  
 Libellula vibrans  
 Plathemis lydia  
 sr Villosa constricta  
 Anodonta cataracta  
 st Stophitus undulatus  
 st Alasmodonta varicosa  
 Elliptio complanata  
 Uniomerus tetralasmus  
 Haplotrema concavum  
 Triodopsis juxtidentis  
 Triodopsis fallax



**SITE NAME:** Wood's Mill Bend

**SIGNIFICANCE:** State

**INTEGRITY:** High to good

**THREATS:** High -- effluents from the Siler City wastewater plant

**PROTECTION STATUS:** None

**JURISDICTION:** Hickory Mountain

**OWNERSHIP:** Private

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

1. The pool and riffle habitat present at this site once supported a diverse community of aquatic organisms, including the federally-endangered Cape Fear shiner (Notropis mekistocholas). Six species of mussels are still present, including the uncommon notched rainbow (Villosa constricta).
2. The steep rocky bluffs, along with the boulder-choked stream are high in scenic value; at high water, this reach is popular with canoeists.

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

This reach is close to the upstream end of the riffle and pool habitat for which the Rocky River is renowned. At this particular site, enormous boulders choke the stream just below an old and now-breached mill dam. As along other sites downstream, this reach flows past steeply cut bluffs and rock outcrops of the slate belt series.

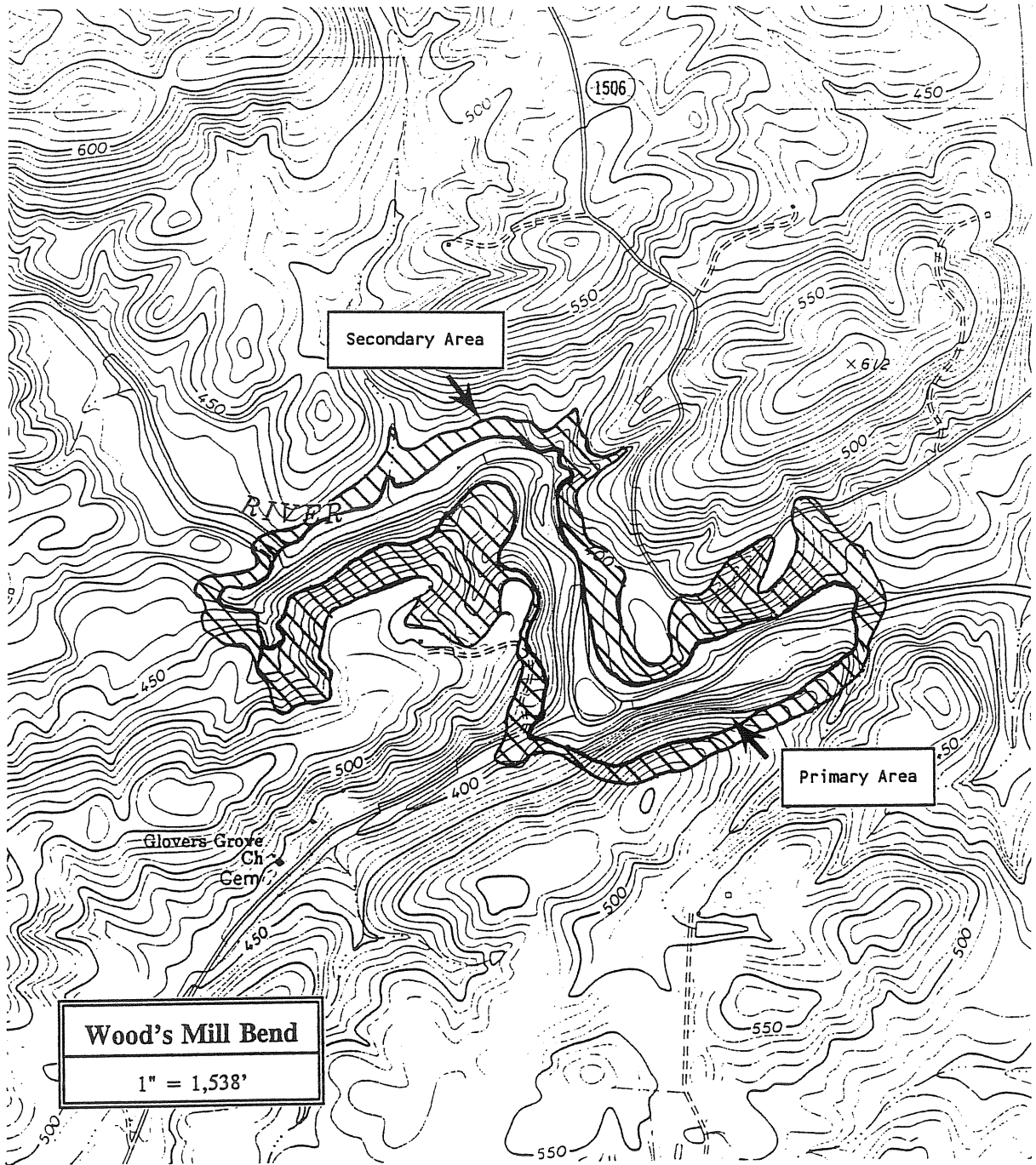
At one time this site must have held one of the richest aquatic communities in the Piedmont, judging by its habitat features. Old records exist from sites just upstream for the Cape Fear shiner, which is federally-listed and endangered, and for the savannah shore mussel (Toxolasma pullus) and squawfoot mussel (Strophitus undulatus), both of which are proposed for threatened status in North Carolina (the shore mussel is also a candidate for federal listing). Although much reduced compared to former times, there is still an abundance of mussels present at this site, including at least six different species, the rarest of which is now the notched rainbow. These species may also be on the wane, however, due primarily to effluents discharged from the Siler City wastewater plant.

Other animals of note include a diverse community of riparian forest birds, including prothonotary warblers (Protonotaria citrea), yellow-throated warblers (Dendroica dominica), northern parula warblers (Parula americana), Louisiana waterthrushes (Seiurus motacilla), and Acadian flycatchers (Empidonax virescens). Species that require large tracts of relatively wild lands include otter (Lutra canadensis), barred owl (Strix varia), broad-winged hawk (Buteo platypterus), and red-shouldered hawk (B. lineatus).

Supporting this diversity of riparian animals is a mesic mixed hardwoods bordering the river on both sides. The canopy is composed of relatively mature individuals of beech (Fagus grandifolia) and red oak (Quercus rubra) and some particularly impressive individuals of southern sugar maple (Acer floridanum) and southern shagbark hickory (Carya carolinenseptentrionalis). The abundant shrub community includes scattered storax (Styrax grandifolia), fringetree (Chionanthus virginicus), and witch hazel (Hamamelis virginiana). Sweet cicely (Osmorhiza longistylis), Jack-in-the-pulpit (Arisaema triphyllum), Solomon's seal (Polygonatum biflorum) and crested iris (Iris cristata) form part of the fairly sparse herb layer at this site. Along the steepest part of the bluffs grow stands of mountain laurel (Kalmia latifolia), as well as a small population of the regionally-rare galax (Galax aphylla).

#### CONSERVATION RECOMMENDATIONS:

Several of the landowners along this reach of the Rocky are quite concerned with conserving the natural values present at this site. They are particularly concerned with water quality issues, but also are aware of the value the riparian forest has as wildlife habitat and as a movement corridor. While the most serious conservation problems can only be solved on a watershed-wide basis, a first step at this site would be its registration as a natural area, followed by formation of a conservation easement or a covenant among the landowners.







## **SITE SURVEY REPORT**

**Site name:** Wood's Mill Bend  
**County:** Chatham

**Date(s):** 15/VI/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:** 108 primary acres + 142 secondary acres = 250 total acres

**Quad:** Siler City, Northeast

**Province:** Piedmont

**Watershed:** Rocky River --> Deep River --> Cape Fear River

**Location and directions:** Stretch of Rocky River at large zig-zag bend located south of NC 1506

### **Landowners and addresses:**

**Owners contacted and attitude:** Cathy Sutton and other owners are interested in protecting this section of the Rocky River, as well as the river as a whole

**General landscape description:** See Site Description

### **Physical description**

**Aspect:** Various

**Slope:** 5-10 to 10-35 on slopes above the river

**Topographic position:** Mid slope to midstream

**Hydrology:** Terrestrial and riverine

**Moisture:** Moist to submerged

**Elevation:** 500 - 360'

**Geology:** Andesitic Crystalline Tuffs; Felsic Crystalline Tuffs

**Soils:** Davidson Clay Loam, Georgeville Stony Silt Loam

**Comments on physical description:** Large boulders choke the stream, creating the many riffles that serve as prime mussel habitat.

## Biological description

### Community # 1: Mesic Mixed-hardwood Forest

**Vegetation structure:** Forest

**Position in landscape and relation to other communities:** slopes on both sides of the river

**Quality and condition:** Good

**Size:**

**Dominants (\*) and important species:**

#### Canopy:

*Acer floridanum*  
*Carya carolinae-septentrionalis*  
*Fagus grandifolia*  
*Liquidambar styraciflua*  
*Quercus rubra*

#### Subcanopy:

*Acer rubrum*  
*Amelanchier arborea*  
*Cornus florida*  
*Ilex opaca*  
*Nyssa sylvatica*  
*Oxydendrum arboreum*

#### Shrubs and vines:

*Chionanthus virginicus*  
*Euonymus americanus*  
*Hamamelis virginiana*  
*Kalmia latifolia*  
*Lonicera japonica*  
*Parthenocissus quinquefolia*  
*Rhododendron nudiflorum*  
*Rhus radicans*  
*Styrax grandifolia*  
*Viburnum acerifolium*  
*Vitis* sp.

#### Herbs:

*Antennaria solitaria*  
*Arisaema triphyllum*  
*Asplenium platyneuron*  
*Athyrium asplenioides*  
rr *Galax aphylla*  
*Goodyera pubescens*  
*Hepatica americana*  
*Hexastylis arifolia*  
*Hexastylis minor*  
*Iris cristata*  
*Luzula acuminata*  
*Microstegium vimineum*  
*Osmorhiza longistylis*  
*Polygonatum biflorum*  
*Polypodium virginianum*  
*Polystichum acrostichoides*  
*Prenanthes altissima*  
*Ranunculus recurvatus*  
*Sanicula canadensis*  
*Sedum ternatum*  
*Silene virginica*  
*Smilacena racemosa*  
*Stellaria pubera*  
*Tiarella cordifolia*  
*Viola papilionacea*

**Special status species**

**State-listed species:**

None

**Potential for other special status species:** High; could contain most, if not all listed mussels found in the Rocky River, as well as *Gomphus septima* and perhaps *Notropis mekistocholas*

**Other noteworthy species or features:**

Plants:

rr Galax aphylla

Animals:

sr Villosa constricta

rr Lutra canadensis

**Site condition**

**Site integrity:** High to good

**Average DBH of canopy trees:**

**Maximum DBH of canopy trees:** 75 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:** No

**Other disturbances:** Yes; houses are situated along the river, although widely spaced and not obtrusive

**Adjacent Land Uses:** Forest and residential

**Significance of site:** State (as part of overall Rocky River system)

**Discussion:** See Site Description

**Protection considerations and management needs:** The presence of several species of state and federally listed animals within this river system warrants the highest level of protection; the entire Rocky River should be included in the state's High Quality Waters program; this particular area should be registered as a state natural area and a conservation easement should be negotiated.

**Determination of survey boundaries:** Encloses area of steep slopes, bottomlands, and extensive riffles occurring at large bend in the river

**Priority for further study:** Medium; *Gomphus septima* is likely to occur at this site and should be looked for in May; a thorough survey should be made of the mussels, fish and other riverine fauna.

**Specimens collected:**

**Photographs:**

**Others knowledgeable about the site:**

**References:**

**Topo map:** Attached

**Sketch map:** None

**Plant Species List:** See Community # 1

**List is:** Cursory

## ANIMAL SPECIES LIST

List is: Cursory

### Vertebrates:

i Buteo lineatus  
 i Buteo platypterus  
 i Coccyzus erythrophthalmus  
 Bubo virginianis \*  
 i Strix varia \*  
 Melanerpes carolinus  
 Picoides pubescens  
 Empidonax virescens  
 Parus carolinensis  
 Parus bicolor  
 Thryothurus ludovicianus  
 Polioptila caerulea  
 Vireo olivaceus  
 Parula americana  
 Dendroica dominica  
 i Protonotaria citrea  
 i Seiurus motacilla  
 Cardinalis cardinalis  
 Didelphis marsupialis \*  
 Castor canadensis \*  
 Procyon lotor \*  
 rr Lutra canadensis \*  
 Sternotherus odoratus  
 i Terrapene carolina  
 Sceloporus undulatus  
 Lampropeltis getulus  
 Nerodia sipedon  
 Hyla chrysoscelis  
 Rana palustris

### Invertebrates:

Papilio glaucus  
 Celastrina ladon  
 Libytheana bachmanii  
 Dromogomphus spinosus  
 i Epiaeschna heros  
 Neurocordulia obsoleta  
 Libellula incesta  
 Libellula vibrans  
 Plathemis lydia  
 Pachydiplax longipennis  
 sr Villosa constricta  
 Villosa delumbis  
 Anodonta cataracta  
 Elliptio complanata  
 Elliptio ravenelli



**SITE NAME:** Rocky River Basalt Bluffs and Levees

**SIGNIFICANCE:** County

**INTEGRITY:** Good to fair

**THREATS:** High -- effluents from the Siler City wastewater plant; timbering

**PROTECTION STATUS:** None

**JURISDICTION:** Hickory Mountain Township; Matthews Township

**OWNERSHIP:** Private

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

1. Historical records exist for the presence at this site of the Cape Fear shiner (Notropis mekistocholas), a federally-endangered species, as well as the Savannah shoremussel (Toxolasma pullus) and squawfoot mussel (Strophitus undulatus), both proposed for state-listing as threatened.
2. The levee forest that grows along the old stagecoach road running beside the river is one of the most outstanding examples in the county. Several trees are quite old and the composition of the forest is somewhat unusual due to the mafic nature of the underlying rocks.
3. The surrounding lands contain large stands of mesic to dry-mesic hardwood forest and provide important habitat for wildlife.

### **GENERAL SITE DESCRIPTION:**

The most prominent geologic feature of this site is a large flow of basalt that crosses the river just upstream from SR 2170. Although this rock formation has an important influence on the vegetation and perhaps on the aquatic fauna, it is not particularly conspicuous as a surface feature, and in general, this reach of the Rocky has relatively few riffle areas, in sharp contrast to sites downstream.

The vegetation along this section of the Rocky can be generally described as dry-mesic oak-hickory forest grading into mesic mixed hardwoods. There is no agricultural or residential development in this reach and the forests are extensive, with ages ranging from clear-cut to fairly mature forest showing few effects of disturbance. The variety of slope and aspect provides habitat for a diversity of subcommunities, including steep bluffs with mountain laurel (Kalmia latifolia) and hydrangea (Hydrangea arborescens), mesic slopes with Jack-in-the-pulpit (Arisaema triphyllum) and broad beech fern (Thelypteris hexagonoptera), and rock outcrops with wild comfrey (Cynoglossum virginianum) and resurrection fern (Polypodium polypodioides). Along the east side of the river near the middle of this stretch is a slope of beech (Fagus grandifolia) and red oak (Quercus rubra) having an open park-like appearance



with swaths of mayapple (Podophyllum peltatum) and bellwort (Uvularia spp.) covering the ground.

The effect of the circumneutral to basic soils weathered from the basalt is most prominently reflected in the levee forest along the southernmost stretch of this section of the river. This community, the most nearly intact along this section of the river, boasts outstanding specimens of shagbark hickory (Carya ovata), southern shagbark hickory (C. carolinense-septentrionalis), hackberry (Celtis laevigata), and southern sugar maple (Acer floridanum), among a high diversity of bottomland tree species. The largest trees noted were a shagbark hickory with a diameter of 74 cm and a hackberry 64 cm in diameter. Buckeye (Aesculus sylvatica), bladdernut (Staphylea trifolia), and coralberry (Symphoricarpos orbiculatus) also give evidence of the richness of the soil.

The water flowing through this reach was probably also high in pH, at least formerly. This may partly account for the abundance of mollusks that once were widespread in this drainage. Water quality degradation, however, has led to the loss of most of this diversity. Two species that historically occurred at this site, the Savannah shore mussel (Toxolasma pullus) and squawfoot mussel (Strophitus undulatus), both of which are now threatened throughout North Carolina, appear to have been extirpated from the entire upper reaches of the Rocky River (John Alderman, pers. comm.), as has the federally-endangered Cape Fear shiner (Notropis mekistocholas). The only basophilic animal we observed at this site was a regionally-rare terrestrial snail (Mesomphix sp.).

While also degraded to varying degrees, the forests adjacent to this site are still extensive enough to serve as an important reservoir for wildlife. The presence of wild turkey (Meleagris gallopavo), wood duck (Aix sponsa), red-shouldered hawk (Buteo lineatus), and the significantly rare sharp-shinned hawk (Accipiter striatus -- observed during mid-July but breeding status not confirmed) all attest to the wilderness-like aspect of this area. Smaller species that also require unbroken tracts of woodlands include the yellow-billed cuckoo (Coccyzus erythrophthalmus), ovenbird (Seiurus aurocapillus), scarlet tanager (Piranga olivacea), and eastern box turtle (Terrapene carolina).

## CONSERVATION RECOMMENDATIONS:

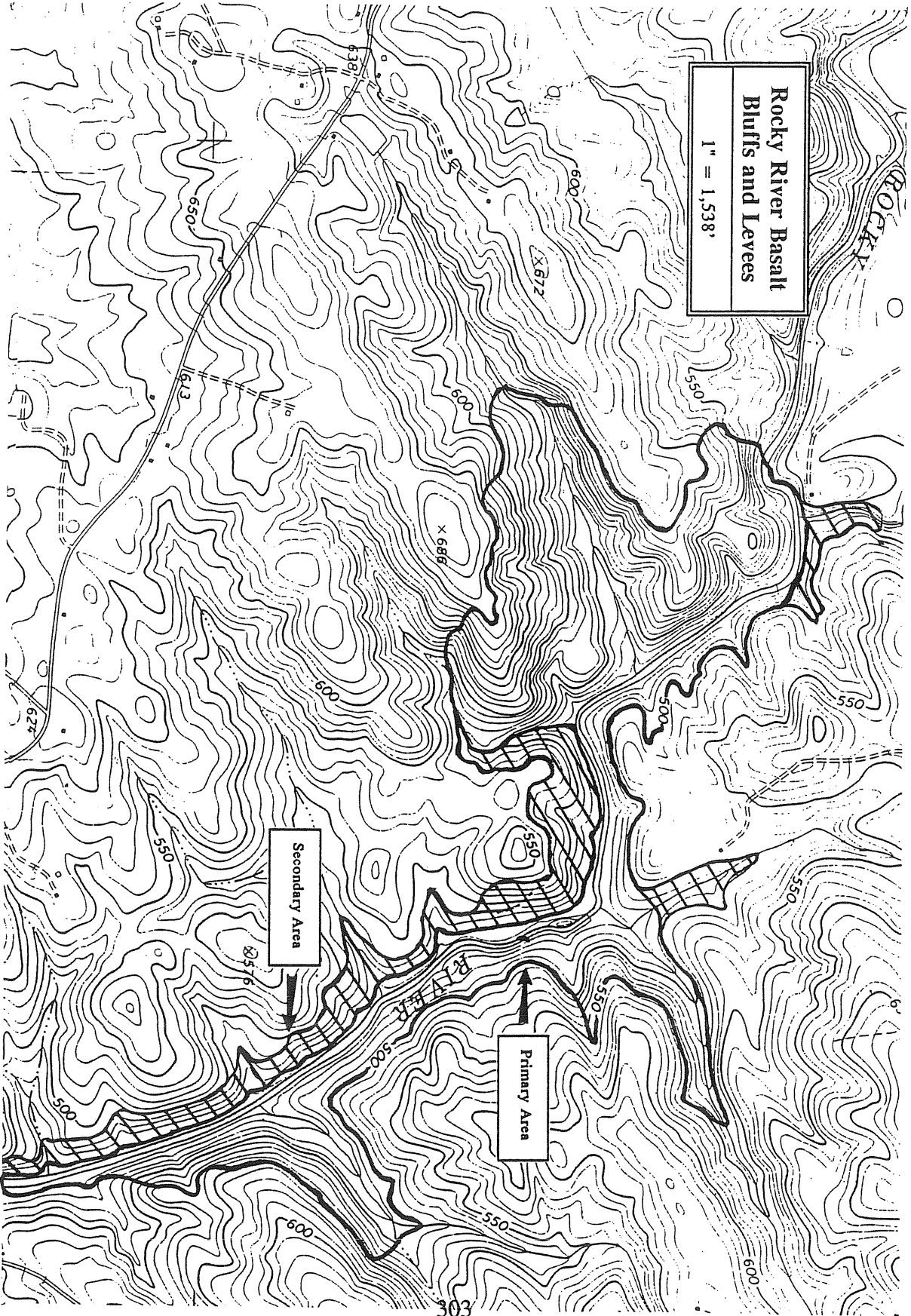
This site lies less than four miles downstream from the outfall of the Siler City wastewater plant. The major conservation challenge at this site, and virtually all others along the Rocky River, is the improvement of the quality of water discharged from this facility.

Other problems are the lack of vegetated strips in several areas adjacent to this reach that have been clear-cut or converted to agricultural uses. The siltation resulting from these non-point sources has also played a role in the decimation of the river's once rich fauna. Landowners should be educated concerning the detrimental effects of such practices and should be offered incentives to compensate for leaving at least some of their property unexploited.

The old stage road that runs along the river at this point is already used as an unofficial greenway, mainly for fishing access and horseback riding. The scenic nature of this reach, especially if enhanced by the restoration of vegetated buffers along the river, would make this a possible route for a more formally-designated hiking path.



**Rocky River Basalt  
Bluffs and Levees**  
1" = 1,538'





## SITE SURVEY REPORT

**Site name:** Rocky River Basalt Bluffs and Levees  
**County:** Chatham

**Date(s):** 23/IX/88, 14/IV/89, 19/VI/89, 28/VII/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:** 352 primary acres + 83 secondary acres = 435 total acres

**Quad:** Siler City

**Province:** Piedmont

**Watershed:** Rocky River --> Deep River --> Cape Fear River

**Location and directions:** Slopes along Rocky River upstream from bridge at NC 2170

### Landowners and addresses:

**Owners contacted and attitude:**

**General landscape description:** See Site Description

### Physical description

**Aspect:** Various

**Slope:** Primarily 5-10 but 10-35 on certain slopes

**Topographic position:** Mid slope to alluvial flat

**Hydrology:** Terrestrial

**Moisture:** Frequently flooded to moist

**Elevation:** 600 - 560'

**Geology:** Basalt flows; meta-basalts with quartz veins

**Soils:** Congaree Silt Loam (levees); Georgeville Stony Silt Loam, Georgeville Gravelly Silty Clay Loam, Goldston Gravelly Silt Loam (slopes); Davidson clay Loam (flat along tributary creek)

**Comments on physical description:** Contains prominent flows of basalt, the only ones mapped for the Rocky River basin.

## Biological description

### Community # 1: Mesic Mixed-hardwood Forest

**Vegetation structure:** Forest

**Position in landscape and relation to other communities:** west- and north-facing slopes located along east side of river

**Quality and condition:** Good to fair

**Size:**

**Dominants (\*) and important species:**

#### Canopy:

Acer rubrum  
Carya carolinae-septentrionalis  
Carya glabra  
Carya ovata  
Carya tomentosa  
Fagus grandifolia  
Liquidambar styraciflua  
Liriodendron tulipifera  
Pinus virginiana  
Quercus alba  
Quercus coccinea  
Quercus falcata  
Quercus rubra  
Quercus stellata

#### Subcanopy:

Carpinus caroliniana  
Cercis canadensis  
Cornus florida  
Ilex opaca  
Juniperus virginiana  
Morus rubra  
Oxydendrum arboreum  
Quercus michauxii  
Rudbeckia laciniata

#### Shrubs and Vines:

Aesculus sylvatica  
Anisostichus capreolata  
Chionanthus virginicus  
Corylus americana  
Elaeagnus umbellata  
Euonymus americanus  
Fraxinus sp.  
Hamamelis virginiana  
Lonicera japonica  
Parthenocissus quinquefolia  
Prunus serotina  
Rosa carolina  
Smilax glauca  
Smilax herbacea  
Ulmus alata  
Ulmus rubra  
Viburnum prunifolium  
Vitis rotundifolia  
Vitis sp.

Herbs:

rr	Agrimonia parviflora	Solidago caesia
	Amsonia tabernaemontana	Stellaria pubera
	Asplenium platyneuron	Thalictrum revolutum
	Aster sp.	Thalictrum thalictroides
	Botrychium biternatum	Thaspium barbinode
	Botrychium virginianum	Tiarella cordifolia
	Cardamine angustata	Tipularia discolor
	Cardamine concatenata	Uvularia perfoliata
	Chamaelirium luteum	Uvularia sessilifolia
	Chimaphila maculata	Viola palmata v. triloba
	Chrysogonum virginianum	Viola papilionacea
	Cimicifuga racemosa	Viola sp.
	Claytonia virginica	Viola tripartita
	Cynoglossum virginianum	Zephyranthes atamasco
	Desmodium nudiflorum	Zizia trifoliata
	Dioscorea villosa	
	Epifagus virginiana	
	Erythronium umbilicatum	
	Fragaria virginiana	
	Galium circaezans	
	Geranium maculatum	
	Goodyera pubescens	
	Hepatica americana	
	Hexastylis arifolia	
	Hypericum sp.	
	Impatiens capensis	
	Iris cristata	
	Ligusticum canadense	
	Melanthium sp.	
	Oxalis violacea	
	Phlox nivalis	
	Phryma leptostachya	
	Podophyllum peltatum	
	Polygonatum biflorum	
	Polypodium polypodioides	
	Polystichum acrostichoides	
	Potentilla canadensis	
	Prenanthes altissima	
	Ruellia caroliniensis	
	Salvia lyrata	
	Sanguinaria canadensis	
	Sanicula canadensis	
	Smilacena racemosa	



## Community # 2: Piedmont Levee Forest

**Vegetation structure:** Forest

**Position in landscape and relation to other communities:** levees and bottomlands

**Quality and condition:** Good

**Size:**

**Dominants (\*) and important species:**

### Canopy:

Acer floridanum  
Acer negundo  
Acer rubrum  
Betula nigra  
Carya carolinae-septentrionalis  
Carya ovata  
Celtis laevigata  
Fagus grandifolia  
Fraxinus sp.  
Liquidambar styraciflua  
Liriodendron tulipifera  
Platanus occidentalis  
Quercus michauxii  
Quercus nigra  
Quercus phellos  
Ulmus alata

### Shrubs and Vines:

Aesculus sylvatica  
Anisostichus capreolata  
Carya cordiformis  
Elaeagnus umbellata  
Ligustrum sinense  
Lindera benzoin  
Lonicera japonica  
Parthenocissus quinquefolia  
Rhus radicans  
Sambucus canadensis  
Smilax bona-nox  
Staphylea trifolia  
Symphoricarpos orbiculatus  
Viburnum prunifolium  
Vitis sp.

### Subcanopy:

Carpinus caroliniana  
Cornus florida  
Ulmus rubra

Herbs:

Agrimonia parviflora  
Allium vineale  
Botrychium virginianum  
Cardamine angustata  
Cardamine hirsuta  
Claytonia virginica  
Corydalis flavula  
Duchesnea indica  
Erythronium umbilicatum  
Galium aparine  
Galium circaezans  
Hexastylis arifolia  
Hystrix patula  
Lamium purpureum  
Laportea canadensis  
Menispermum canadense  
Microstegium vimineum  
Osmorhiza longistylis  
Podophyllum peltatum  
Polygonatum biflorum  
Polystichum acrostichoides  
Ranunculus abortivus  
Stellaria media  
Stellaria pubera  
Thalictrum revolutum  
Thalictrum thalictroides  
Uvularia sessilifolia  
Viola palmata v. triloba  
Viola papilionacea  
Viola rafinesquii

**Community # 3: Dry-mesic Oak-hickory Forest**

**Vegetation structure:** Forest

**Position in landscape and relation to other communities:** north- and east-facing slopes on west side of river in the region of the large bend

**Quality and condition:** Good

**Size:**

**Dominants (\*) and important species:**

Canopy:

*Carya glabra*  
*Carya ovata*  
*Carya tomentosa*  
*Fagus grandifolia*  
*Quercus alba*  
*Quercus rubra*  
*Quercus velutina*

Herbs:

*Arisaema triphyllum*  
*Podophyllum peltatum*  
*Polystichum acrostichoides*  
*Thelypteris hexagonoptera*  
*Tiarella cordifolia*

Subcanopy:

*Cercis canadensis*

Shrubs and vines:

*Aesculus sylvatica*  
*Asimina parviflora*  
*Hamamelis virginiana*  
*Hydrangea arborescens*  
*Kalmia latifolia*  
*Lindera benzoin*  
*Styrax grandifolia*  
*Viburnum acerifolium*  
*Xanthorrhiza simplicissima*

## Special status species

### State-listed species:

#### Animals:

fe Notropis mekistocholas  
st Toxolasma pullus  
sr Accipiter striatus (seen in August; possibly a post-breeding vagrant)

Potential for other special status species: Low

### Other noteworthy species or features:

#### Plants:

rr Amsonia tabernaemontana

#### Animals:

rr Meleagris gallopavo  
rr Mesomphix sp.

#### Geology:

Basalt flows

## Site condition

Site integrity: Good to fair

Average DBH of canopy trees: 30 cm (for tract as a whole)

Maximum DBH of canopy trees: 74 cm (*Carya ovata*), 64 cm (*Celtis*), 49 cm (*Acer floridanum*); largest trees were all located on the levee

Fire regime: Natural

Logged: Within last 30-40 years (levee forest is markedly older)

Evenness of canopy: Natural

Ditched/drained: No

Stream channelized: No

Dredged/filled: No

Understory cleared: No

Grazed: No

ORV damaged: No

Other disturbances: Yes; clearcuts border the area on all sides

**Adjacent Land Uses:** Forest, residential

**Significance of site:** County

**Discussion:** See Site Description

**Protection considerations and management needs:** Landowners should be alerted to the significance of the mature levee forest; old stage road running along the river has scenic and historic values; mesic forests along the slopes would enhance these values if allowed to mature.

**Determination of survey boundaries:** Encloses levees, bottomlands, and steep slopes along east bank of river above SR 2170; also includes area of hardwoods located on west bank of river on slopes adjacent to the large z-shaped bend.

**Priority for further study:** Medium; presence of *Toxolasma* and *Notropis* needs confirmation

**Specimens collected:**

**Photographs:**

**Others knowledgeable about the site:**

**References:** Shelley, R.M. 1987. Unionid mollusks of the upper Cape Fear River Basin, North Carolina, with a comparison of the faunas of the Neuse, Tar, and Cape Fear drainages (Bivalvia: Unionacea). *Brimleyana* 13:67-89.

**Topo map:** Attached

**Sketch map:** None

## PLANT SPECIES LIST

List is: Medium Thorough

- Botrychium biternatum (6)  
Botrychium virginianum (6)  
Polystichum acrostichoides (11)  
Thelypteris hexagonoptera (11)  
Asplenium platyneuron (13)  
Polypodium polypodioides (14)  
Pinus virginiana (16)  
Juniperus virginiana (18)  
Hystrix patula (29)  
Microstegium vimineum (29)  
Arisaema triphyllum (32)  
Allium vineale (41)  
Chamaelirium luteum (41)  
Erythronium umbilicatum (41)  
Melanthium sp. (41)  
Polygonatum biflorum (41)  
Smilacena racemosa (41)  
Smilax bona-nox (41)  
Smilax glauca (41)  
Smilax herbacea (41)  
Uvularia perfoliata (41)  
Uvularia sessilifolia (41)  
Dioscorea villosa (43)  
Zephyranthes atamasco (44)  
Iris cristata (46)  
Goodyera pubescens (49)  
Tipularia discolor (49)  
Carya caroliniae-septentrionalis (53)  
Carya cordiformis (53)  
Carya glabra (53)  
Carya ovata (53)  
Carya tomentosa (53)  
Betula nigra (54)  
Carpinus caroliniana (54)  
Corylus americana (54)  
Fagus grandifolia (55)  
Quercus alba (55)  
Quercus coccinea (55)  
Quercus falcata (55)  
Quercus michauxii (55)  
Quercus nigra (55)  
Quercus phellos (55)  
Quercus rubra (55)  
Quercus stellata (55)  
Quercus velutina (55)  
Celtis laevigata (56)  
Ulmus alata (56)  
Ulmus rubra (56)  
Morus rubra (57)  
Laportea canadensis (59)  
Hexastylis arifolia (62)  
Claytonia virginica (70)  
Stellaria media (71)  
Stellaria pubera (71)  
Cimicifuga racemosa (76)  
Hepatica americana (76)  
Ranunculus abortivus (76)  
Thalictrum revolutum (76)  
Thalictrum thalictroides (76)  
Xanthorhiza simplicissima (76)  
Podophyllum peltatum (77)  
Menispermum canadense (79)  
Liriodendron tulipifera (80)  
Asimina parviflora (81)  
Lindera benzoin (84)  
Sanguinaria canadensis (85)  
Corydalis flavula (86)  
Cardamine angustata (88)  
Cardamine concatenata (88)  
Cardamine hirsuta (88)  
Hydrangea arborescens (94)  
Tiarella cordifolia (94)  
Hamamelis virginiana (95)  
Liquidambar styraciflua (95)  
Platanus occidentalis (96)  
Agrimonia parviflora (97)  
Duchesnea indica (97)  
Fragaria virginiana (97)  
Potentilla canadensis (97)  
Prunus serotina (97)  
Rosa carolina (97)

*Cercis canadensis* (98)  
*Desmodium nudiflorum* (98)  
*Oxalis violacea* (100)  
*Geranium maculatum* (101)  
*Rhus radicans* (110)  
*Ilex opaca* (112)  
*Euonymus americanus* (113)  
*Staphylea trifolia* (114)  
*Acer floridanum* (115)  
*Acer negundo* (115)  
*Acer rubrum* (115)  
*Aesculus sylvatica* (116)  
*Impatiens capensis* (118)  
*Parthenocissus*  
     *quinquefolia* (120)  
*Vitis rotundifolia* (120)  
*Vitis* sp. (120)  
*Hypericum* sp. (126)  
*Viola palmata* var. *triloba* (130)  
*Viola papilionacea* (130)  
*Viola rafinesquii* (130)  
*Viola* sp. (130)  
*Viola tripartita* (130)  
*Elaeagnus umbellata* (134)  
*Ligusticum canadense* (140)  
*Osmorhiza longistylis* (140)  
*Sanicula canadensis* (140)  
*Thaspium barbinode* (140)  
*Zizia trifoliata* (140)  
*Cornus florida* (142)  
*Chimaphila maculata* (145)  
*Kalmia latifolia* (145)  
*Oxydendrum arboreum* (145)  
*Styrax grandifolia* (152)  
*Chionanthus virginicus* (153)  
*Fraxinus* sp. (153)  
*Ligustrum sinense* (153)  
rr *Amsonia tabernaemontana* (156)  
*Phlox nivalis* (159)  
*Cynoglossum virginianum* (161)  
*Phryma leptostachya* (163)  
*Lamium purpureum* (164)  
*Salvia lyrata* (164)  
*Anisostichus capreolata* (167)  
*Epifagus virginiana* (169)  
*Ruellia caroliniensis* (171)  
*Galium aparine* (173)  
*Galium circaezans* (173)  
*Lonicera japonica* (174)  
*Sambucus canadensis* (174)  
*Symphoricarpos orbiculatus*  
     (174)  
*Viburnum acerifolium* (174)  
*Viburnum prunifolium* (174)  
*Aster* sp. (179)  
*Chrysogonum virginianum* (179)  
*Prenanthes altissima* (179)  
*Rudbeckia laciniata* (179)  
*Solidago caesia* (179)

## ANIMAL SPECIES LIST

List is: Medium-thorough

### Vertebrates:

i Aix sponsa  
 sr Accipiter striatus  
 i Buteo lineatus  
 rr Meleagris gallopavo  
 i Scolopax minor  
 Zenaida macroura  
 i Coccyzus erythrophthalmus  
 Megaceryle alcyon  
 Melanerpes carolinus  
 Picoides pubescens  
 Empidonax virescens  
 Cyanocitta cristata  
 Parus carolinensis  
 Parus bicolor  
 Thryothurus ludovicianus  
 Hylocichla mustelina  
 Vireo griseus  
 Vireo flavifrons  
 Vireo olivaceus  
 Parula americana  
 Dendroica dominica  
 Dendroica pinus  
 Dendroica discolor  
 i Seiurus aurocapillus  
 i Seiurus motacilla  
 Piranga olivacea  
 Cardinalis cardinalis  
 Carduelis tristis  
 Scalopus aquaticus  
 Castor canadensis  
 Chrysemys concinna  
 i Terrapene carolina

### Vertebrates (cont.):

Bufo americanus  
 Bufo woodhousei fowleri  
 Acris crepitans  
 Rana catesbeiana  
 Rana clamitans  
 Rana palustris  
 fe Notropis mekistocholas<sup>1</sup>

### Invertebrates:

Papilio glaucus  
 Enodia portlandia  
 Hermeuptychia hermes sosybius  
 Epithea princeps  
 st Toxolasma pullus<sup>2</sup>  
 rr Mesomphix sp.  
 Haplotrema concavum  
 Mesodon thyroidus  
 Triodopsis fallax

1. Natural Heritage database
2. Shelley, R.M. 1987.



