



Soil & Environmental Consultants, PA

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October 16, 2006
S&EC Project No.: 10467.W3

Robert Swain
P.O. Box 5689
Cary, NC 27513

Re: Natural Community Analysis for the Banner Tract
Chatham County, North Carolina

Dear Mr. Swain:

The purpose of this report is to advise you on the existing habitat types and the potential presence of protected plant and animal species on the property known as the Banner Tract residential development. The site is adjacent to the Haw River, east of Rock Rest Road approximately 5000 feet east of its intersection with Old Highway 87. The site is approximately 200 acres in size. Figure 1 shows the location of the site on a USGS topographic quadrangle.

Executive Summary

There are four federally listed Threatened and Endangered Species in Chatham County, NC, none of which were observed on-site during the field survey. Suitable habitat for State listed species; The Four-Toed Salamander, Sweet Pinesap, Carolina Ladle Crayfish, and the Buttercup Phacelia exists on property. In order to effectively survey for the State listed species further investigation would be required. Surveys for the Four-Toed Salamander, Sweet Pinesap, and the Buttercup Phacelia should be conducted in the spring.

Introduction

Under the Endangered Species Act (ESA) (1973), species may be listed as either "endangered" or "threatened." For the purposes of the ESA, Congress defined species to include subspecies, varieties, and, for vertebrates, distinct population segments. Section 4 of the ESA specifies that a species must be listed as endangered or threatened solely on the basis of its biological status and

threats to its existence. When evaluating a species for listing, five factors are considered: 1) damage to, or destruction of, a species' habitat; 2) overuse of the species for commercial, recreational, scientific, or educational purposes; 3) disease or predation; 4) the inadequacy of existing protection; and 5) other natural or human related threats to the species' survival. When one or more of these factors imperils the survival of a species, the United States Fish and Wildlife Service (FWS) takes action to protect it. To ensure the accuracy of the data, the FWS decides all listings using sound science and peer review.

Section 7 of the ESA requires federal agencies to use their legal authorities to promote the conservation purposes of the law. This section also requires federal agencies to consult with the FWS to ensure that actions they authorize, fund, or carry out will not jeopardize listed species. The consulting agency then receives a "biological opinion" on the proposed action. In the relatively few cases where the FWS or National Marine Fisheries Service (NMFS) determines that the proposed action will jeopardize the species, they must offer "reasonable and prudent alternatives" about how the proposed action could be modified to avoid potential impacts to the protected species. It is uncommon for the USACE to withdraw or terminate projects because of jeopardy to a listed species, however it is common for there to be conditions applied to approvals, and/or modifications of projects.

Section 10 of the ESA provides relief to private landowners who want to develop land inhabited by listed species. Landowners can receive a permit for the taking of a listed species that may occur incidental to otherwise legal activities, provided they have developed an approved Habitat Conservation Plan (HCP). HCPs include an assessment of the likely impacts on the species from the proposed action, the steps that will be taken to minimize and mitigate those impacts, and the funding available to carry out those steps. When the FWS approves the HCP, the landowner can apply for an "incidental take" permit, which allows them to proceed with the proposed action.

RECORDS REVIEW

The North Carolina Natural Heritage Program (NHP) records occurrences of rare plant and animal species, exemplary natural communities, and special animal habitats known to occur in North Carolina. An updated record check was performed in October 2006. The subject property is located on the Bynum USGS quadrangle.

Chatham County Federally Listed species:

- 1) Bald Eagle (*Haliaeetus leucocephalus*)
- 2) Red-cockaded Woodpecker (*Picoides borealis*)
- 3) Cape Fear Shiner (*Notropis mekistocholes*)
- 4) Harperella (*Ptilimnium nodosum*).

Other state-listed species and/or Federal Species of Concern:

<i>Aimophila aestivalis</i>	Bachman's sparrow	NC-SC	US-FSC
<i>Lanius ludovicianus</i>	Loggerhead shrike	NC-SC	
<i>Phalacrocorax auritus</i>	Double-crested cormorant	NC-SR	
<i>Hemidactylium scutatum</i>	Four-toed salamander	NC-SC	
<i>Etheostoma collis</i> pop.2	Carolina darter	NC-SC	US-FSC
<i>Moxostoma</i> sp 2	Carolina redhorse	NC-SR	US-FSC
<i>Alasmidonta undulata</i>	Triangle floater	NC-T	
<i>Alasmidonta varicosa</i>	Brook floater	NC-E	US-FSC
<i>Fusconaia masoni</i>	Atlantic pigtoe	NC-E	US-FSC
<i>Lampsilis cariosa</i>	Yellow lampmussel	NC-E	US-FSC
<i>Strophitus undulatus</i>	Creepers	NC-T	
<i>Villosa constricta</i>	Notched rainbow	NC-SC	
<i>Villosa delumbis</i>	Eastern creekshell	NC-SR	
<i>Villosa vaughaniana</i>	Carolina creekshell	NC-E	US-FSC
<i>Cambarus davidi</i>	Carolina ladle crayfish	NC-SR	
<i>Choroterpes basalis</i>	a mayfly	NC-SR	
<i>Gomphus abbreviatus</i>	Spine-crowned clubtail	NC-SR	
<i>Gomphus quadricolor</i>	Rapids clubtail	NC-SR	
<i>Gomphus septima</i>	Septima's clubtail	NC-SR	US-FSC
<i>Neurocordulia virginienis</i>	Cinnamon shadowdragon	NC-SR	
<i>Tricorythodes robacki</i>	a mayfly	NC-SR	
<i>Allium cuthbertii</i>	Striped garlic	NC-SR-T	
<i>Baptisia albescens</i>	Thin-pod White Wild Indigo	NC-SR-P	
<i>Collinsonia tuberosa</i>	Piedmont horsebalm	NC-SR-P	
<i>Dichantheium annulum</i>	a witch grass	NC-SR-P	
<i>Fothergilla major</i>	Large witch-alder	NC-SR-T	
<i>Hexastylis lewisii</i>	Lewis's heartleaf	NC-SR-L	
<i>Isoetes virginica</i>	Virginia quillwort	NC-SR-L	US-FSC
<i>Monotropsis odorata</i>	Sweet pinesap	NC-SR-T	US-FSC
<i>Phacelia covillei</i>	Buttercup phacelia	NC-SR-T	US-FSC
<i>Porteranthus stipulatus</i>	Indian physic	NC-SR-P	
<i>Scutellaria nervosa</i>	Veined skullcap	NC-SR-P	
<i>Thermopsis mollis</i>	Appalachian golden-banner	NC-SR-P	

NC-SC: North Carolina Special concern

NC-SR: North Carolina Significantly Rare

NC-T: North Carolina Threatened

NC-E: North Carolina Endangered

US-FSC: US Special concern

"Endangered Species" (E) means any native species documented by biological research and inventory to be in danger of extirpation throughout all or a significant portion of its range within the state and to have no more than five occurrences in the state, and any species determined to be an "endangered species" pursuant to the federal Endangered Species Act.

"Threatened Species" (T) means any native species documented by biological research and inventory to be likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range within the state and to have no more than nine occurrences in the state, and any species determined to be a "threatened species" pursuant to the federal Endangered Species Act, except for such species determined to be endangered by the Commissioner in accordance with section 4 of this act.

“Species of Special Concern” (SC) means any native plant species or any native nonharvested wildlife species documented by scientific research and inventory to have a naturally restricted range or habitat in the state, to be at a low population level, to be in such high demand by man that its unregulated taking would be detrimental to the conservation of its population or has been extirpated from the state.

“Significantly Rare” (SR) Species which are very rare in North Carolina, generally with 1-20 populations in the state, generally substantially reduced in numbers by habitat destruction (and sometimes also by direct exploitation or disease). These species are generally more common somewhere else in their ranges, occurring in North Carolina peripherally to their main ranges, mostly in habitats which are unusual in North Carolina. Also included are some species with 20-100 populations in North Carolina, if they also have only 50-100 populations rangewide and are declining.

Identified Priority Areas

The Haw River borders the northern and eastern portion of the property. Rock Rest Mafic Islands and Shores is a Natural Heritage Program (NHP) Identified Priority Area (IPA). The Haw River Aquatic Habitat is a NHP IPA, occurring adjacent to the property boundary. In addition, another locally designated IPA, Terrell’s Creek Galax Bluffs, occurs along Terrell’s Creek approximately 2.0 miles northwest of the site.

Local Elemental Occurrences

The closest protected elemental occurrence of a federally listed and / or endangered species is the Cape Fear Shiner (*Notropis mekistocholas*) was documented approximately 2 miles southeast of the site, within the Haw River. . The Cape Fear shiner is currently federally listed as “endangered”. Documented occurrences of *Gomphus septima* (NC-SR; US-FSC) and *Phacelia covellei* (NC-SR-T; FSC) occur within a 5 mile radius of the property boundary.

Haw River Species

In addition to the Cape Fear Shiner, other listed species that occur within the Haw River downstream of the site near Bynum, North Carolina include the state-listed Endangered Yellow Lampmussel (*Lampsilis cariosa*), and a state-listed Significantly Rare Septima’s Clubtail Dragonfly (*Gomphus septima*). An occurrence of the Buttercup Phacelia (*Phacelia covelli*) is recorded approximately 1.5 miles northwest of the site along the floodplain of the Haw River. A list of the occurrences within the Bynum USGS quadrangle:

Bynum USGS

IPAs: Terrell’s Creek Galax Bluffs (local)
Duke Forest/Haw River Slopes & Levees
Haw River Aquatic Habitat

Plants:

Phacelia ranunculacea
Syn. *Phacelia covillei* (Buttercup Phacelia)
NC-SR-T; FSC

Animals:

Notropis mekistocholas (Cape Fear Shiner)
NC-E; US-E (2 dots on map; found
1992, 1993, and 2000)
Gomphus septima (Septima's clubtail)
NC-SR; US-FSC
Lampsilis cariosa (Yellow Lampmussel)
NC-E; US-FSC

FIELD SURVEY

Natural communities are recurring assemblages of plants and animals found in particular physical environments. Natural communities are influenced by topography, parent material, and human activity. Each type of natural community has a unique set of environmental conditions that support certain species that have adapted to those conditions. By examining natural community types a majority of species can be accurately located by eliminating unsuitable habitat for survey.

Transects were run on foot and by vehicle throughout the property. Groundtruthing of specific habitat types and ecotones was done in the field with a Garmin GPS unit. On the ground surveys were verified using 1998 color infrared aerial images.

No mussel surveys were conducted. However, suitable habitat for *Villosa vaughaniana* Carolina Creekshell (E), *Strophitus undulates* Creeper (T), *Fusconaia masoni* Atlantic Pigtoe, *Alasmidonta varicose* Brook Floater, and *Alasmidonta undulate* Triangle Floater occurs on property.

RESULTS

Habitat Types

Streams consist of ephemeral channels that begin in the upland areas on property, grading into intermittent and the perennial streams, which then flow into the Haw River. Wetlands are scattered throughout the floodplain of the Haw River and along the margins of some streams.

Piedmont alluvial forests (Schafale and Weakley 1990) occur in the river and stream floodplains throughout the property. These are seasonally or intermittently flooded forest systems. Field surveys revealed that examples of these forests on-site consist of open to dense understory or shrub layer and sparse to dense, diverse herb layer. The canopy consists of a mixture of

bottomland and mesophytic trees including *Betula nigra*, *Plantanus occidentalis*, *Fraxinus spp.*, *Liquidambar styraciflua*, *Liriodendron tulipifera*, *Ulmus americana*, *Celtis laevigata*, *Carya ovata*, *Quercus imbricaria*, and *Acer rubrum*. Shrubs include *Lindera benzoin*, *Aesculus sylvatica*, *Leucothoe recurva*, and *Cornus amomum*. The herb layer is generally lush and diverse. Species include: *Claytonia virginica*, *Uvularia sessilifolia*, *Impatiens capensis*, *Nemophylla aphylla*, *Toxicodendron radicans*, *Lamium purpureum*, *Hexastylis spp.*, *Stellaria pubera*, *Galium spp.*, *Arundinaria spp.*, and *Parthenocissus virginiana*. Many areas of these forests on property are heavily invaded by the non-native *Lonicera japonica* and *Microstegium vimineum* most likely at the expense of native herbs.

The Piedmont alluvial forest borders the River Channel of the Haw River. Rocky Bar and Shore communities and Sand and Mud Bar communities also occur along the property's border with the Haw River. These communities are distinguished by the combination of location, substrate, and lack of tree canopy.

The stream channel of the Haw River borders a Piedmont Heath Bluff community at the southeastern corner of the property. This community type on property is dominated by a dense layer of *Kalmia latifolia*. A diversity of trees from the surrounding forest occurs within this community. The herb layer is sparse under the dense shrub layer. Herbs include: *Chimaphila maculata*, *Hexastylus spp.*, and *Mitchella repens*.

The Piedmont alluvial forests grade into Dry-mesic oak-hickory forests at higher elevations on property. Field surveys revealed that these forests are dominated by a mixture of oaks, hickories, and other hardwoods. Portions of the dry upland forests have recently (+/- 10 years) been cut over and harvested for timber. Areas in the middle and southeastern portion of the property are mature loblolly pine.

Protected Species

North Carolina Natural Heritage Program has documented 54 occurrences of State or Federally listed assemblages, communities, and species in Chatham County, NC. In Chatham County there are 14 Invertebrate Animals, 18 Natural Communities, 12 Vascular Plants, and 9 Vertebrate Animals, and 1 Animal Assemblage listed within the database. State and Federally listed species without obvious suitable habitat on property were omitted from the survey. The property boundaries were surveyed for suitable habitat of the following NHP documented species occurring within a 10 mile radius of the property:

Cape Fear Shiner

As mentioned above, the closest documented element occurrence of a federally listed and / or endangered species is of the Cape Fear Shiner (*Notropis mekistocholes*) (NC-E; US-E), which was documented approximately 4 miles

southeast of the site, within the Haw River. The Cape Fear Shiner inhabits sandy and rocky pools and runs of small to medium rivers. This type of habitat is found along the northeastern border of the property. Habitat for the Cape Fear Shiner is located adjacent to the property. The Cape Fear Shiner was not surveyed for within the Haw River adjacent to the property.

Septima's Clubtail

A rare invertebrate species, Septima's clubtail (*Gomphus septima*) (NC-SR; US-FSC) was documented as an elemental occurrence approximately 1000 feet southwest of the property, upstream within the Haw River. *Gomphus septima* was documented perching on rocks protruding from the Haw River. Typical habitat for *G. septima* includes rivers with numerous rapids and exposed rocks. This type of habitat is found within the portion of the Haw River adjacent to the property. Suitable habitat occurs adjacent to the property but no individuals were observed.

Yellow Lampmussel

The Yellow Lampmussel (*Lampsilis cariosa*), (NC-E; US-FSC) can be found in gravel bars, margins of the flowing portions of water bodies and cracks in bedrock in both large rivers and small streams. The Yellow Lampmussel has been documented within the Haw River Aquatic Habitat. The type of habitat required for this species was found adjacent to the property along its border with the Haw River. Suitable habitat occurs within the property boundaries where perennial streams are present.

Bald Eagle

The Bald Eagle (*Haliaeetus leucocephalus*) (NC-T; US-T) lives near large bodies of open water such as lakes, marshes, coasts, and rivers, where there are plenty of fish to eat and tall trees for nesting and roosting. Known populations occur downstream of the site in closer proximity to Lake Jordan. Trees of suitable nesting quality occur along the floodplain of the Haw River on property, however no nest sites were located on property and no individuals were observed.

Red-cockaded Woodpecker

The Red-cockaded Woodpecker (RCW) (*Picoides borealis*) (NC-E; US-E), is a habitat specialist, requiring mature growth of pine forest with a grassland component underneath. For nesting/roosting habitat, open stands of pine containing trees 60 years old and older. Red-cockaded woodpeckers need live, large older pines in which to excavate their cavities. Longleaf pines (*Pinus palustris*) are most commonly used, but other species of southern pine are also acceptable. Dense stands (stands that are primarily hardwoods, or that have a dense hardwood understory) are avoided. Foraging habitat is provided in pine

and pine hardwood stands 30 years old or older with foraging preference for pine trees 10 inches or larger in diameter. In good, moderately stocked, pine habitat, sufficient foraging substrate can be provided on 80 to 125 acres. Suitable habitat for the RCW was not found, no nest sites were discovered on property. The Red-cockaded woodpecker has only a historical documented occurrence in Chatham County.

Harperella

Harperella (*Ptilimnium nodosum*) (NC-E; US-E) typically occurs in two habitat types: (1) rocky or gravel shoals and margins of clear, swift-flowing stream sections; and (2) edges of intermittent pineland ponds in the coastal plain. This plant tolerates and may actually require a very specific and unusual water regime, which includes moderately intensive spring floods that may reduce or eliminate competing vegetation. Harperella is readily eliminated from its habitat by alterations of the water regime which result from impoundments, water withdrawal, and drainage or deepening of ponds. Other factors such as siltation, pollution, and shoreline development also threaten Harperella populations. Riverine populations flower beginning in late June or July and continue until frost. Although no populations of Harperella were found on property, suitable habitat does exist in areas along the margin of the Haw River.

Buttercup Phacelia

Phacelia ranunculacea (NC-SR-T; US-FSC) (syn. *Phacelia covillei*) is documented as an element occurrence adjacent the property near the bridge over the Haw River on Chicken Bridge Road (SR 1545). Typical habitat for this species occurs within the fine textured soils of Piedmont alluvial forests and floodplains. *Phacelia covillei* is documented only in Alamance, Chatham, Lee, and Harnett counties in North Carolina. Based on recent site observations, populations of buttercup phacelia may be negatively affected by outcompetition by invasive exotic plant species (e.g. *Microstegium*, etc.) and a recent increased abundance of native wildlife such as white-tailed deer. *Phacelia covillei* co-occurs with *Nemophylla aphylla*, these two species are very similar in overall appearance and phenology, flower and fruit characteristics are used to distinguish them from one another, which emphasizes the importance of conducting the field survey during the flowering and/or fruiting stages of its life cycle. This woodland herb species typically flowers in April to May and was apparent during the time of the survey. *Phacelia covillei* can be differentiated from *P. dubia* in the field. Specifically, the leaves of *P. covillei* are all petioleate and the stamens are included within the corolla tube. In contrast, *P. dubia* cauline leaves are sessile and the stamens are weakly exerted from the corolla tube.

The survey of the property and examination of the plant and animal communities revealed presence of suitable habitat for the buttercup phacelia on property (See

suitable habitat map for details). The optimal survey window for *P. covillei* occurs from April to May. Further investigation is needed to confirm the presence or absence of this specific species of plant.

Carolina Ladle Crayfish

The Carolina Ladle Crayfish (*Cambarus davidi*) (NC-SR) is documented from a single individual captured about 6 miles due south in a tributary on Roberson Creek at US 64, Pittsboro (NHP EO ID 3066). *Cambarus davidi* is apparently limited to the upper Neuse and Cape Fear river basins in the eastern Piedmont Plateau of North Carolina (Cooper 2000). Suitable habitat for this species occurs in intermittent streams (under larger rocks) and burrows. Suitable habitat for *C. davidi* occurs on property, but no individuals were observed during the stream survey. Burrows were found along a section of intermittent stream and further investigation is needed to confirm the presence or absence of this specific species of crayfish.

Four-Toed Salamander

The Four-Toed Salamander (*Hemidactylium scutatum*) (NC-SC) is documented from an egg mass observed under sphagnum in the Lessler Montmorillonite Forest 5.5 miles southeast of the property (NHP EO ID 9662). *Hemidactylium scutatum* is a small, slender salamander and is orange to grayish brown above, sometimes with small black and bluish speckles on the sides. The tail is constricted (narrows) at its base, and there are only four toes on each hind foot (most salamanders have five toes). Adults are 2 to 4 inches (5 to 10 cm) long. Suitable habitat is found throughout much of the state, but only where boggy ponds or spring fed creeks are available in or near damp wooded habitat. When not breeding, they take refuge under rotting logs and leaf litter. They eat insects and insect larvae, spiders, worms, and other small invertebrates. Suitable habitat for *H. scutatum* occurs on property, but no individuals were encountered in the field survey. The Optimal field survey window for *H. scutatum* is during May when its eggs are hatching. Further investigation would be needed to confirm the presence or absence of this specific species of salamander on-site.

Sweet Pinesap

Sweet Pinesap (*Monotropsis odorata*), is significantly rare-throughout North Carolina. *Monotropsis odorata* is a very small plant that blooms in early spring, and is found in mixed deciduous woods. There is a known location of this species north of the site; therefore, we surveyed the site for associated habitat and vegetation. In order to accurately locate suitable habitat of Sweet Pinesap (*Monotropsis odorata*) we used Natural heritage Program EO_ID 18744 as a reference population. EO_ID 18744 was documented in a Dry-Mesic Oak-Hickory forest with granitic soils and thick leaf litter. We walked transects in order to search for suitable habitat of *M. odorata*. Field surveys indicated

potential habitat for *M. odorata* occurs on site, but no individuals were observed. The optimal field survey window for this species is February to June.

CONCLUSION / RECOMMENDATIONS

Soil and Environmental Consultants, PA concludes that suitable habitat exists on property for the following State listed species: 1) The Carolina Ladle Crayfish (*Cambarus davidi*), 2) The Four-Toed Salamander (*Hemidactylium scutatum*), and 3) Buttercup Phacelia (*Phacelia covillei*). In order to effectively survey for the State listed species further investigation would be required. Surveys for the Four-Toed salamander, Sweet Pinesap, and the Buttercup Phacelia should be conducted in the spring. There are four Federally listed Threatened and Endangered Species in Chatham County, NC, none of which were observed on-site during the field survey.

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

Respectively,

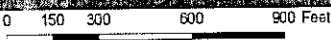
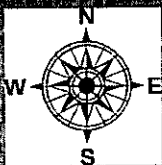
James R. Graham Jr.
Biologist / Environmental Scientist

David Gainey
Project Manager/
Environmental Specialist









Attachments: Figure 1. USGS Vicinity Map
Figure 2. Community Type and Suitable Habitat Sketch Map

References:

Classification of the Natural Communities of North Carolina (Third Approximation) Michael P. Schafale and Alan S. Weakley, 1990



Legend

-  = Mixed Mature and Immature Loblolly Forest
-  = Immature Pine Forest
-  = 10+ Year Cutover
-  = Suitable Breeding Habitat for Four-Toed Salamander And Carolina Lodie Crayfish
-  = Mature Dry Mesic Oak- Hickory Forest
-  = Piedmont Heath Bluff
-  = Piedmont Alluvial Forest
-  = Mature Loblolly Pine Forest

Note: Non-Outlined areas consist of Dry Mesic Oak-Hickory Forest interspersed with Mature Loblolly Pine



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Community Type and Suitable Habitat Field Sketch Map

Project Manager:
David Gainey

Project Number:
10467.W3

Scale:

1" = 300'

Prepared by:
David Gainey

Banner Tract
Chatham County, NC