



Soil & Environmental Consultants, PA

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Revised October 2006
S&EC Project No.:8126.W1

MacGregor Development
Attn: Bruce Herbert
201 Shannon Oaks Circle, Suite 201
Cary, North Carolina 27511

Re: Revised: Environmental Status Report for Boothe Mountain Property
Chatham County, North Carolina

Dear Mr. Herbert:

The purpose of this report is to advise you on the plant community types and the potential for protected species on the Boothe Mountain Project. This revised report is the conclusion of a survey of the proposed road alignment for suitable habitat and occurrences of the vascular plant Witch Alder (*Fothergilla major*) and Buttercup Phacelia (*Phacelia covillei*). The work was completed in October 2006. The site is located on the northern side of Jack Bennet Road (S.R. 1717) approximately 2000 feet from its intersection with Big Woods Road (S.R. 1716). The subject property is approximately 314 acres in size.

Executive Summary

There are four federally listed in Chatham County, NC, none of which were observed onsite during the field survey. Of the thirty-three state listed species in Chatham County, none were observed on the property. No habitat or individual occurrences of (Witch Alder) *Fothergilla major* were found within the proposed road alignment. S&EC recommends a full survey for Witch Alder (*Fothergilla major*) be conducted during the spring blooming period due to the acreage of the remaining habitat. After review of the proposed site plans, habitat for the Buttercup Phacelia (*Phacelia covillei*) should be contained within the proposed buffers. No Phacelia habitat is located within the proposed road alignment. A field survey for the Sweet Pinesap (*Monotropsis odorata*) was conducted during the fruiting period and none were found within the Suitable Habitat. No federally protected species were found on the property during the evaluation.

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Introduction

Under the Endangered Species Act (ESA) (1973), species may be listed as either "endangered" or "threatened." Endangered means a species is in danger of extinction throughout all or a significant portion of its range. Threatened means a species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. All species of plants and animals, except pest insects and non-native species, are eligible for listing as 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 January 1998 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 very rare to withdraw or terminate projects because of jeopardy to a listed species, however conditions to, and modifications of projects are common.

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 take 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 June 2006.

Chatham County Federally Listed species:

- 1) Bald Eagle (*Haliaeetus leucocephalus*)
- 2) Red-cockaded Woodpecker (*Picooides 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>	Creeper	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 virginiana</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>Dichanthelium 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.

The file review yielded no federally listed plant or animal species found within the project boundaries. The closest protected elemental occurrence, the bald eagle (*Haliaeetus leucocephalus*), was documented approximately 0.6 miles south of the site along Bush Creek. This species is currently federally protected as threatened however is a candidate for delisting. Just north of the site (approximately 600 feet), a federal plant species of concern, *Monotropsis odorata*, was documented.

A significant county feature (Herndon Creek Ravine) is found along Herndon Creek on the subject property and is discussed in a 1988 survey completed by Stephen Hall of the NC Natural Heritage Program and Marjorie Boyer of the NC Plant Conservation Program (see attached). Because of the sensitive nature of this area, a significant amount of time was spent evaluating the ravine for the presence of rare flora and/or fauna. This feature is characterized by mesophytic species along the steep north-facing slopes. However, this site contains a lower diversity of mesophytic species than typically found in similar settings, most likely due to logging activities and past disturbance.

FIELD SURVEY

The purpose of this survey was to determine the plant community types on the property and to assess their potential as habitat for protected species. Transects were walked across the property, and aerial photos and various mapping resources were used to focus the search in areas that would most likely harbor sensitive species.

Natural communities are recurring assemblages of plants and animals found in particular physical environments. 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. Known populations of listed species were observed for visual references and intense surveys of suitable habitat were conducted.

In order to accurately locate suitable habitat of sweetpinesap (*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. Associated vegetation was *Vaccinium pallidum* and *Carex nigro-marginata*. These populations were last observed on February 25, 2002. EO_ID 15678 documented *M. odorata* in a steep ravine along the south side of Morgan Creek. These populations were observed on July 11, 1988. In June, 2006 we conducted a field survey for *M. odorata* using these documented characteristics as guides. We also walked transects in order to search for *M. odorata* fruiting bodies.

RESULTS

Plant Communities

Mesic Mixed Hardwood Forest

This plant community type is found on the north-facing slopes along Herdon Creek, and extends somewhat onto lower slopes on the north side of the creek. This community is rich and varies in species throughout the growing season. Canopy species consists of red oak (*Quercus rubra*), American beech (*Fagus grandifolia*), tuliptree (*Liriodendron tulipifera*), sweetgum (*Liquidambar styraciflua*), and red maple (*Acer rubrum*). The subcanopy and shrub layer contain umbrella magnolia (*Magnolia tripetala*), witch-hazel (*Hamamelis virginiana*), maple-leaved viburnum (*Viburnum acerifolium*), downy arrowwood (*V. rafinesquianum*), and redbud (*Cercis canadensis*). Herbs are diverse and include round-lobed hepatica (*Hepatica americana*), wild ginger (*Asarum canadense*), heartleaf (*Hexastylis* spp.), iris (*Iris* sp.), trillium (*Trillium* sp.), Christmas fern (*Polystichum acrotichoides*), and ebony spleenwort (*Asplenium platyneuron*).

Oak-hickory Forest

This community type dominates the site (Figure 1). On the higher elevation slopes, the dry oak-hickory forest is more distinct. The dry oak-hickory forest blends into a more dry-mesic oak-hickory forest below about 450 feet. Evidence of past selective logging was observed on most of the site. At the higher elevation, white oak (*Q. alba*) dominates with fewer mockernut hickory (*Carya tomentosa*), black gum (*Nyssa sylvatica*), red maple, and sweetgum (*Liquidambar styraciflua*). Shortleaf pine (*Pinus echinata*) is found throughout this community. The subcanopy and shrub layer was sparse and contained young red maple, tuliptree, and dogwood. The ground cover was unusual in

that it was mostly muscadine grape (*Vitis rotundifolia*). In the dry-mesic oak-hickory forest there is more sweetgum, tuliptree, loblolly pine (*Pinus taeda*), and a variety of oaks (*Quercus* spp.). The more mesic sites have a richer shrub layer, dominated by seedlings of canopy trees.



Figure 1. Oak-Hickory Forest at Boothe Hill, Chatham County, North Carolina.

Pine-Hardwood

This community type is used to describe areas in the past that were disturbed as a result of agriculture, abandoned pastures, intense logging and that have now partially reforested or are in the process of reforestation. These areas are composed of typical early successional species such as, loblolly pine, sweetgum, tuliptree, red maple, various oaks, and Eastern red cedar (*Juniperus virginiana*). Adjacent stands have various densities of pine and hardwoods.

Semipermanent Impoundment

This community lies along the lower portion of Herndon Creek. Beaver (*Castor canadensis*) have dammed the creek, raising the water level, and slowing its passage downstream. Most trees in the standing water have died with the exception of black willow (*Salix nigra*), sycamore (*Platanus occidentalis*), red maple, and black gum (*Nyssa biflora*). Wetland herbs include cottongrass bulrush (*Scirpus cyperinus*), cattail (*Typha latifolia*), soft rush (*Juncus effusus*), arrowhead (*Sagittaria* sp.), climbing hempvine (*Mikania scandens*), and mosquito fern (*Azolla caroliniana*).

Low Elevation Seep

This community is very small in extent and is found in several locations. There is usually a small but permanent source of water low on the side of a slope or in a small ravine. Shrubs include highbush blueberry (*Vaccinium corymbosum*) and winterberry (*Ilex verticillata*). Herbs include spotted touch-me-not (*Impatiens capensis*), lizard's tail (*Saururus cernuus*), jack-in-the-pulpit (*Ariseama triphyllum*), royal fern (*Osmunda regalis*), cinnamon fern (*Osmunda cinnomomea*), and several species of mosses.

Protected Species

After the survey of the property and examination of the plant and animal communities no listed species were found within the property boundaries. It was concluded that the required habitat for the terrestrial species that are listed as threatened or endangered in Chatham County does not exist. These are the Bald Eagle (*Haliaeetus leucocephalus*), Red-cockaded Woodpecker (*Picoides borealis*), Cape Fear Shiner (*Notropis mekistocholes*), and Harperella (*Ptilimnium nodosum*).

There is possible habitat for several state sensitive species:

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 (NHP EO ID 9662). *Hemidactylium scutatum* is a small, slender salamander 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. Potential habitat for this species is found in several locations on site, however no individuals were observed.

Piedmont Horsebalm (*Collinsonia tuberosa*), significantly rare-peripheral, is found in rich hardwood forests or moist forests. This perennial herb flowers from late July through September. No individuals were found on property during the 2004 survey.

Buttercup Phacelia (*Phacelia covillei*) [= *P. ranunculacea*], significantly rare-throughout, is found on bottomlands and rich lower slopes. This species is a delicate spring ephemeral. Potential habitat for these species exists on the site, no individuals were observed. After review of the proposed site plans habitat for the Buttercup Phacelia (*Phacelia covillei*) should be contained within the proposed buffers and is not found within the proposed road alignment.

Large Witch-alder (*Fothergilla major*), significantly rare-throughout, is a shrub found on dry ridgetops and bluffs. There is suitable habitat for this species on site. No individuals were observed within the proposed road alignment.

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. Potential habitat for *Monotropsis odorata* occurs on site, no individuals were observed after a survey completed during the fruiting period.


CONCLUSION

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*). A survey of the proposed road alignment was conducted for the Witch Alder (*Fothergilla major*) and found no plants within this alignment. The survey of the road alignment contains no potential habitat and it was effectively surveyed outside of the flowering season within the proposed road alignment. S&EC recommends a full survey for Witch Alder (*Fothergilla major*) be conducted during the spring blooming period for the acreage outside the road alignments due to the acreage of the remaining habitat. A field survey for the Sweet Pinesap (*Monotropsis odorata*) was conducted during the fruiting period and none were found within the Suitable Habitat. After review of the proposed site plans habitat for the Buttercup Phacelia (*Phacelia covillei*) should be contained within the proposed buffers and no suitable habitat is located within the proposed road alignment. 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.

Sincerely,


James R. Graham Jr.
Biologist / Environmental scientist


David Gainey
Environmental scientist