



Soil & Environmental Consultants, PA

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April 19, 2007
S&EC Project # 8126.W6

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

Re: Detailed Threatened and Endangered Species
Survey on the Booth Mountain/Westfall Tract (+/-314 acres)
Chatham County, North Carolina

INTRODUCTION

The purpose of this report is to provide updated information on the presence of protected plant and animal species on the Booth Mountain/Westfall Tract. This report details the results of surveys for the Sweet Pinesap (*Monotropsis odorata*), the Four-toed Salamander (*Hemidactylium scutatum*), the Carolina Ladle Crayfish (*Cambarus davidi*), Buttercup Phacelia (*Phacelia covillei*), and Large Witch Alder (*Fothergilla major*). The site is located north of Jack Bennett 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

Suitable habitat for Sweet Pinesap, the Four-toed Salamander, the Carolina Ladle Crayfish, Buttercup Phacelia, and Large Witch Alder was found on property during previous surveys of the Booth Mountain/Westfall tract.

A detailed survey was conducted for Sweet Pinesap in February and March 2007, within the recommended optimal survey window. The area surveyed includes the entirety of the property with the exception of areas exhibiting early succesional characteristics, floodplain, wetland and stream habitats. No specimens of Sweet Pinesap were located during this survey.

A survey was conducted in February and March 2007 for the Four-toed Salamander and the Carolina Ladle Crayfish. No specimens of the Four-toed Salamander were located during this survey. Seven individuals of the Carolina Ladle Crayfish were located at five separate locations within the project boundaries.

A detailed survey was conducted for Buttercup Phacelia and Large Witch Alder in April 2007, within the recommended optimal survey window. The area surveyed includes the entirety of the property with the exception of areas exhibiting early successional characteristics. No specimens of Buttercup Phacelia or Large Witch Alder were located during this survey.

FIELD SURVEY

The purpose of this survey was to investigate the presence of Sweet Pinesap, the Four-toed Salamander, the Carolina Ladle Crayfish, Buttercup Phacelia, and Large Witch Alder on the subject property.

In order to accurately locate suitable habitat of **Sweet Pinesap** (*Monotropis 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 herbaceous vegetation was *Vaccinium pallidum* and *Carex nigromarginata*. Additionally, EO_ID 15678 documented *M. odorata* in a steep ravine along the south side of Morgan Creek. These populations were last observed on July 11, 1988. In February and March 2007 we conducted a field survey for *M. odorata* using these documented characteristics as guides but not limiting ourselves to these communities.

Aerial photos, topographical maps, and GPS were used to focus the search in areas that would most likely harbor this species. Because the majority of the soil on site is acidic, and thereby suitable for the species, the entirety of the property was traversed in order to rule out any unsuitable plant community types before conducting in-depth searches for Sweet Pinesap. Detailed surveys were conducted in all community types exhibiting mid to late successional features as well as marginal habitats. On 13 March 2007, further investigation was conducted of the habitat surrounding the EO_ID 18744. Areas with a greater possibility of occurrence due to disturbance were brought to our attention. Areas of the Booth/Westfall property showing mild disturbance such as tree falls and animal activity were closely surveyed.

Several trips were made to survey the project site, during which at least two and up to four individuals spread out in the woods to look for the plant. Transects were walked with individuals spaced approximately 10 meters apart. A GPS unit was utilized using the tracking feature to more accurately conduct transects without overlap or spreading out too far. Both visual and olfactory methods were used during the search.

In order to locate suitable habitat for the **Four-toed Salamander**, we researched publications and visited known nesting sites. On March 8th and March 21st 2007, S&EC personnel visited known localities for Four-toed Salamanders and confirmed that they were breeding in the North Carolina piedmont both before and after conducting our survey of the subject property. The survey for the Four-toed Salamander on the subject property on March 14th

and 15th 2007 focused on streams, wetland areas, and other wet areas with suitable moss habitat for nesting. Two individuals searched, in tandem, for the species. Survey methods used to locate the Four-toed Salamander included turning rocks and logs and lifting moss mats to search for adults and eggs. All areas of potential habitat on the Booth Tract were surveyed in their entirety for the Four-toed Salamander. This survey was conducted during the optimal survey window for this species.

In order to locate suitable habitat for the **Carolina Ladle Crayfish**, we researched publications and relied upon extensive previous observations of this species. The survey for the Carolina Ladle Crayfish on March 14th and 15th included all streams and wetlands on the property. Two individuals searched, in tandem, for the crayfish. Survey methods used to locate the Carolina Ladle Crayfish included turning rocks and logs and dip-netting in streams.

In order to locate suitable habitat for **Buttercup Phacelia**, we researched publications and an element occurrence near the bridge over the Haw River on Chicken Bridge Road (SR 1545). On April 18, 2007 we conducted a field survey on the Booth/Westfall Tract for Buttercup Phacelia using these referenced habitat types as guides.

Topographical maps, aerial maps, preliminary wetland sketch maps, and GPS were used to focus the search in areas that would most likely harbor this species. The entirety of the suitable habitat on property was surveyed for the plant. Portions of the Herndon Creek floodplain are suitable habitat for this species. Detailed surveys were conducted in areas of optimal habitat as well as marginally suitable habitats. For the purposes of this report, we define optimal habitat as floodplain areas along Herndon Creek, and marginally suitable habitat as floodplain and upland areas along streams.

One trip was made to survey the subject property, during which two individuals searched, in tandem, for the plant. Search protocol for Buttercup Phacelia includes walking transects performing visual encounter searches, especially in floodplain areas.

In order to locate suitable habitat for **Large Witch Alder**, we researched publications and visited an element occurrence documented by the NC Natural Heritage Program (EO_ID 7266). We also studied techniques for identification of this species versus Witch Hazel (*Hamamelis virginiana*).

Topographical maps, aerial maps, preliminary wetland sketch maps, and GPS were used to focus the search in areas that would most likely harbor this species. The entirety of the suitable habitat on property was surveyed for the plant. Much of the property consists of steep bluffs, which are suitable habitat for this species. Detailed surveys were conducted in areas of optimal habitat as well as marginally suitable habitats. For the purposes of this report, we define optimal habitat as steep, north-facing bluffs, and marginally suitable habitat as less steep, and/or south-facing slopes.

Three trips were made to survey the subject property, during which two individuals searched, in tandem, for the plant. Search protocol for Large Witch

Alder includes walking transects performing visual encounter searches, especially on steep, north-facing bluffs.

RESULTS

During the survey for **Sweet Pinesap**, no specimens were found. Approximately 50 old, dry fruiting stalks of a similar plant, Indian Pipe (*Monotropa uniflora*), were found on a north facing slope in the southwest portion of the Booth/Westfall property (see map).



Indian Pipe (*Monotropa uniflora*) - photos by David Cooper

No **Four-toed Salamanders** or their eggs were located on the property during the field survey. One area of optimal habitat was identified associated with a rocky wetland seep on the south side of Herndon Creek (see map).



Optimal habitat for the Four-toed Salamander- photo by David Cooper

Seven specimens of the **Carolina Ladle Crayfish** were located during the field survey, all of which were found under rocks. Specimens were located in five separate areas on property, including the main perennial feature (Herndon Creek), 3 unnamed tributaries of Herndon Creek, and a rocky seep within a wetland on the south side of Herndon Creek (see map). Adult and subadult specimens were identified in the field by S&EC staff. Other crayfish species found on property during the survey included *Cambarus sp. C* (formerly assigned to *C. acuminatus*) and *Procambarus acutus*.



Carolina Ladle Crayfish- photo by David Cooper

During the survey for **Buttercup Phacelia**, no specimens were found. No sympatric indicator species such as Smallflower Baby Blue-eyes (*Nemophila aphylla*) were seen on-site.

During the survey for **Large Witch Alder**, no specimens were found. Many specimens of Witch Hazel, a sympatric species that is sometimes found with Large Witch Alder, were seen on-site. Care was taken to distinguish this species in the field. Because many of the plants did not flower this year, and

therefore could not be identified by the flowers, surveys were concluded only after mature leaves were available for identification.

CONCLUSIONS AND RECOMMENDATIONS

S&EC does not recommend further surveys for the Sweet Pinesap due to extensive surveys conducted within its flowering and fruiting periods. Also, no further surveys are recommended for the Four-toed Salamander due to the extensive surveys conducted during the optimal survey window. All areas found to be inhabited by the Carolina Ladle Crayfish are contained within buffered or no-impact areas. With the current site plan, no adverse affects to the crayfish are expected. S&EC does not recommend further surveys of the Booth/Westfall Tract for the Buttercup Phacelia or Large Witch Alder due to extensive surveys conducted within its flowering period.

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

Respectfully,


David Gainey
Project Manager / Environmental Specialist


James R. Graham Jr.
Biologist / Environmental Scientist


David Kwasniewski
Environmental Scientist


David G. Cooper
Staff Biologist

Attachments:

- 1) Locations of Listed Species Map
- 2) Partial Species List

References

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Species List: February and March 2007

Booth Mountain/Westfall

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Invertebrates

- Carolina Ladle Crayfish (NCNHP-SR) *Cambarus davidi* – 7 total on property (6 found on 3/14 and 1 found on 2/27). *C. davidi* was found in 5 different locations, including the main perennial feature (Herndon Creek), 3 unnamed intermittent tributaries of Herndon Creek, and a rocky seep within a wetland on the south side of Herndon Creek- see map.
- *Cambarus sp. C*- many found within Herndon Creek.
- White River Crayfish *Procambarus acutus*- 1 subadult male in Herndon Creek near beaver impoundment. Also 1 adult female found dead within beaver impoundment on 2/12/07.
- Various stonefly larvae- plentiful.
- Various mayfly larvae
- Dragonfly larvae
- Tabanid (Horse) fly larvae- plentiful.
- Caddisfly larvae
- Aquatic snails- plentiful.
- Paper Pondshell (mussel) *Utterbackia imbecilis*- many freshly dead mussels stranded from drainage of beaver impoundment seen on 3/15/07.
- Mourning Cloak (butterfly) *Nymphalis antiopa*
- American Bird Grasshopper *Schistocerca americana*

Fish

- Shiner *Notropis sp.* (most likely either *alborus* or *procne*)
- Mosquitofish *Gambusia holbrooki*
- Green Sunfish *Lepomis cyanellus*
- Bluespotted Sunfish *Enneacanthus gloriosus*- many dead along mudflats of beaver impoundment 2/12/07.

Amphibians and Reptiles

- American Toad *Bufo americanus*- calling individuals and amplexing pairs found in wetland floodplain of Herndon Creek 3/14/07. Eggs were present on 3/15/07 in wetlands and within pools left after the draining of the beaver impoundment. Also 1 found dead within beaver impoundment on 3/15/07.
- Upland Chorus Frog *Pseudacris feriarum*- several calling from various locations on property. 1 seen in road rut pool.
- Spring Peeper *Pseudacris crucifer*- several calling from various locations on property.
- Spotted Salamander *Ambystoma maculatum*- several egg masses
- Mud Salamander *Pseudotriton montanus*- 1 adult under large log along Herndon Creek
- Northern Dusky Salamander *Desmognathus fuscus*- several larvae. 1 adult seen 2/12/07.

- Two-lined Salamander *Eurycea cirrigera*- several adults, both male and female. Also many clusters of eggs under rocks within Herndon Creek.
- Northern Cricket Frog *Acris crepitans*- many adults wherever water was present on property.
- Green Frog *Rana clamitans*- two individuals in Herndon Creek, 1 dead and the other dying.
- Ground Skink *Scincella lateralis*- several on property.
- Green Anole *Anolis carolinensis*- several on property.
- Northern Water Snake *Nerodia sipedon*- 1 male along Herndon Creek 3/14/07, 3 specimens (not captured) along Herndon Creek 3/15/07.
- Redbelly Water Snake *Nerodia erythrogaster*- 1 adult eating a *Bufo americanus* within drained beaver impoundment 3/15/07
- River Cooter *Pseudemys concinna*- many within drained beaver impoundment 3/15/07
- Yellow-bellied Slider *Trachemys scripta*- 1 female within drained beaver impoundment 3/15/07
- Eastern Mud Turtle *Kinosternon subrubrum*- 1 old adult (unsexed) within drained beaver impoundment 3/15/07.
- Snapping Turtle *Chelydra serpentina*- 1 adult male in mudflats of drained beaver impoundment 3/15/07.
- Black Racer *Coluber constrictor* male 3/12/07
- Black Rat Snake *Elaphe obsoleta* female 3/12/07
- Worm Snake *Carphophis amoenus*

Birds

- Red-bellied woodpecker *Melanerpes carolinus*
- Pileated woodpecker *Dryocopus pileatus*
- Eastern Bluebird *Sialia sialis*
- Wood Duck *Aix sponsa*
- Red-shouldered Hawk *Buteo lineatus*
- Carolina Chickadee *Poecile carolinensis*
- Red-breasted Nuthatch *Sitta canadensis*